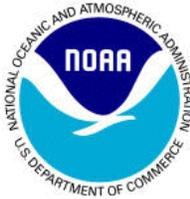


Amendment 41 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region



February 28, 2017



Environmental Assessment Regulatory Impact Review Regulatory Flexibility Analysis Fishery Impact Statement
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Abbreviations and Acronyms Used in the FMP

ABC	acceptable biological catch	FMU	fishery management unit
ACL	annual catch limits	M	natural mortality rate
AM	accountability measures	MARMAP	Marine Resources Monitoring Assessment and Prediction Program
ACT	annual catch target	MFMT	maximum fishing mortality threshold
B	a measure of stock biomass in either weight or other appropriate unit	MMPA	Marine Mammal Protection Act
B_{MSY}	the stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}	MRFSS	Marine Recreational Fisheries Statistics Survey
B_{OY}	the stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}	MRIP	Marine Recreational Information Program
B_{CURR}	the current stock biomass	MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
CPUE	catch per unit effort	MSST	minimum stock size threshold
DEIS	draft environmental impact statement	MSY	maximum sustainable yield
EA	environmental assessment	NEPA	National Environmental Policy Act
EEZ	exclusive economic zone	NMFS	National Marine Fisheries Service
EFH	essential fish habitat	NOAA	National Oceanic and Atmospheric Administration
F	a measure of the instantaneous rate of fishing mortality	OFL	overfishing limit
F_{30%SPR}	fishing mortality that will produce a static SPR = 30%	OY	optimum yield
F_{CURR}	the current instantaneous rate of fishing mortality	RFA	Regulatory Flexibility Act
F_{MSY}	the rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}	RIR	Regulatory Impact Review
F_{OY}	the rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}	SAFMC	South Atlantic Fishery Management Council
FMP	fishery management plan	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 41 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Proposed action:	The actions are to update biological benchmarks and allowable fishing levels for mutton snapper based on the latest stock assessment and revise management measures.
Lead agency:	FMP Actions – South Atlantic Fishery Management Council Environmental Assessment – National Marine Fisheries Service (NMFS) Southeast Regional Office
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Summary

Why is the South Atlantic Council considering action?

In 2012, the Comprehensive Annual Catch Limit (ACL) Amendment for the South Atlantic Region (SAFMC 2011c) allocated the mutton snapper acceptable biological catch (ABC) between the South Atlantic and Gulf of Mexico Fishery Management Councils based on landings which are allocated to each Council using the Monroe (Florida Keys) County boundary¹. The South Atlantic Fishery Management Council (South Atlantic Council) received 82% of the ABC and the Gulf of Mexico Fishery Management Council received 18% of the ABC (established using 50% of average landings from 1990-2008 + 50% of average landings from 2006-2008). The following parameters (pounds whole weight; lbs ww) were implemented for mutton snapper in the South Atlantic through the Comprehensive ACL Amendment:

Parameter	Value
Overfishing Limit (OFL)	1,515,300
Acceptable Biological Catch (ABC)	926,600
Annual Catch Limit (ACL)	926,600
Commercial ACL	157,707
Recreational ACL	768,893
Recreational Annual Catch Target (ACT)	668,937

The current commercial ACL is 157,743 lbs ww and the recreational ACL is 768,857 lbs ww (*NOTE: The commercial allocation in the Comprehensive ACL Amendment was 17.02% and the recreational allocation was 82.98%. However the ACLs that were implemented were calculated using this allocation to 6 decimal places instead of 2).*

In 2015, an update to the stock assessment for mutton snapper in the southeastern U.S. was conducted with data through 2013 (SEDAR 15A Update 2015). The South Atlantic Council needs to take action to implement the biological benchmarks and fishing levels recommended by the latest stock assessment update (SEDAR 15A Update 2015). However, **based on improvements to the modeling approach used in the stock assessment, the 2015 assessment estimated a smaller adult population compared to the 2008 assessment. Because of this finding, the South Atlantic Council’s Scientific and Statistical Committee (SSC) recommends a lower ABC to maintain sustainable harvest.** Consequently, the South Atlantic Council is considering actions to modify existing management measures for mutton snapper to achieve the desired level of harvest.

¹ The South Atlantic Council’s management jurisdiction extends from the North Carolina-Virginia border through the Florida Keys. See Figure 1.3.1.

What actions are being proposed in this amendment?

Amendment 41 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) proposes the following 8 actions for mutton snapper in the South Atlantic Region:

1. Specify maximum sustainable yield (MSY)

Currently: not specified

Preferred Alternative 2. 912,500 pounds whole weight (lbs ww)

2. Specify minimum stock size threshold (MSST)

Currently: not specified

Preferred Alternative 3. MSST = 75% SSB_{MSY} = 3,486,900 lbs ww

3. Revise annual catch limits (ACLs) and optimum yield (OY) (see Table S-1)

Currently: ACL = OY = ABC = 926,600 lbs ww

Commercial ACL = 157,743 lbs ww

Recreational ACL = 768,857 lbs ww

Preferred Sub-alternative 2a. ACL = OY = ABC = 129,150 fish for 2017.

Commercial ACL = 100,015 lbs ww (for 2017)

Recreational ACL = 116,127 fish (for 2017)

4. Revise the recreational annual catch target (ACT)

Currently: ACT = recreational ACL*(1-PSE) or ACL*0.5, whichever is greater = 668,906 lbs ww

Preferred Sub-alternative 2b. ACT = 85% recreational ACL = 98,708 fish

5. Modify the minimum size limit

Currently: minimum size limit = 16 inches total length (TL)

Preferred Alternative 3. 18 inches TL

6. Designate the “spawning months” for regulatory purposes

Currently: Seasonal harvest limitations apply to the commercial sector during mutton snapper spawning in May and June each year. There are no comparable seasonal restrictions during May and June that apply to the recreational sector.

Preferred Sub-alternative 2a. For regulatory purposes, designate April-June as “spawning months.” The remainder of the year would be the “regular season.”

7. Modify the recreational bag limit

Currently: 10 fish/person/day, included in the 10-snapper aggregate bag limit.

Preferred Sub-alternative 4c. Retain mutton snapper within the recreational 10 snapper aggregate bag limit in the South Atlantic, but specify bag limit of 5 fish/person/day within the aggregate bag limit year round.

8. Modify the commercial trip limit

Currently: Commercial restrictions apply May through June - 10 fish/person/day or 10 fish/person/trip, whichever is more restrictive. There is no possession or trip limit for the commercial sector in the South Atlantic from January through April and July through December.

Preferred Sub-alternative 2c. Establish a commercial trip limit of 500 pounds for mutton snapper during the “regular season” (i.e., non-spawning months) in the South Atlantic.

Preferred Sub-alternative 3f. Specify a commercial trip limit for mutton snapper during the “spawning months” in the South Atlantic of 5 fish/person/day or 5 fish/person/trip, whichever is more restrictive.

What is the acceptable biological catch recommendation for mutton snapper?

What is Acceptable Biological Catch?

ABC = Acceptable Biological Catch

The ABC is the maximum amount of fish stock than can be harvested without adversely affecting recruitment or other components of the stock. The ABC level is sometimes higher than the annual catch limit, leaving a buffer between the two.

An update to the stock assessment for mutton snapper in the southeastern U.S. (SEDAR 15A Update 2015) was conducted in 2015 with data through 2013. The South Atlantic Council's SSC reviewed the results at their April 28-30, 2015, meeting and made the following fishing level recommendations for mutton snapper in the South Atlantic:

Table S-1. Mutton Snapper recommendations from SEDAR 15A Update (2015). ABC to be specified based on landings projections in numbers of fish.

Criteria	Deterministic	Probabilistic
Overfished evaluation	Not overfished: $SSB/SSB_{F_{30\%}}=1.13$	
Overfishing evaluation	Not overfishing: $F/F_{30\%SPR}=0.65$	
MFMT ($F_{30\%SPR}$)	0.18	
SSB _{30%SPR} (lbs females)	4,649,200	
MSST (lbs females)	4,137,700	
Y at $F_{30\%SPR}$ (MSY proxy, lbs)	912,500	
Y at $F_{40\%SPR}$ (lbs)	874,000	
ABC Control Rule Adjustment		20%
P-Star		30%

Year	OFL RECOMMENDATIONS					
	Landings (lbs)	Discards (lbs)	Catch (lbs)	Landings (numbers)	Discards (numbers)	Catch (numbers)
2017	751,711	55,962	807,673	164,150	29,660	193,810
2018	793,823	56,994	850,817	173,656	30,071	203,727
2019	835,318	58,170	893,488	180,716	30,430	211,146
2020	850,077	58,857	908,934	184,868	30,780	215,648

Year	ABC RECOMMENDATIONS ($P^* = 0.30$)					
	Landings (lbs)	Discards (lbs)	Catch (lbs)	Landings (numbers)	Discards (numbers)	Catch (numbers)
2017	717,200	53,700	770,900	157,500	28,400	185,900
2018	746,800	53,900	800,700	164,500	28,300	192,800
2019	774,400	54,400	828,800	169,300	28,300	197,600
2020	798,300	54,500	852,800	172,700	28,300	201,000

Purpose for Actions

The *purpose* of this amendment is to update the acceptable biological catch, annual catch limit, maximum sustainable yield, minimum stock size threshold, optimum yield, and revise management measures for the mutton snapper component of the snapper grouper fishery based on the results of the most recent stock assessment.

Need for Actions

The *need* for the amendment is to base mutton snapper management measures on the best scientific information available in order to achieve and maintain optimum yield and to prevent overfishing while minimizing, to the extent practicable, adverse social and economic effects.

Chapter 1. Introduction

1.1 What actions are being proposed in this amendment?

Amendment 41 to the Snapper Grouper FMP proposes to modify management of mutton snapper in the South Atlantic to respond to a recent stock assessment and protect mutton snapper during the spawning season. Actions in the amendment include the modification of management benchmarks and allowable fishing levels.

The amendment would also designate the “spawning months” (during which stricter regulations may apply), modify the minimum size limit, recreational bag limit, and commercial trip limit.

South Atlantic Fishery Management Council

- Responsible for conservation and management of fish stocks in the South Atlantic Region
- Consists of 13 voting members who are appointed by the Secretary of Commerce, 1 representative from each of the 4 South Atlantic states, the Southeast Regional Administrator 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 nautical 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

1.2 Who is proposing the amendment?

The South Atlantic Fishery Management Council (South Atlantic Council) develops the amendment and submits it to the National Marine Fisheries Service (NMFS) which, on behalf of the Secretary of Commerce, ultimately approves, disapproves, or partially approves the amendment. NMFS also implements the actions in the amendment through the development of regulations through rulemaking. NMFS is an office of the National Oceanic and Atmospheric Administration. The South Atlantic Council and NMFS are also responsible for making this document available for public comment. The draft environmental assessment (EA) was made available to the public during the scoping process, public hearings, and in South Atlantic Council meeting briefing books. The final EA/amendment will be published for public comment during the notice of availability and proposed rule stages of the rulemaking process. The public hearing draft and final EA/amendment may be found online at:

http://sero.nmfs.noaa.gov/sustainable_fisheries/s_atl/sg/2016/am41/index.html and on the South Atlantic Council website at <http://www.safmc.net>.

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 1.3.1**). Mutton snapper is among the fifty-five species managed by the South Atlantic Council under the Snapper Grouper FMP.

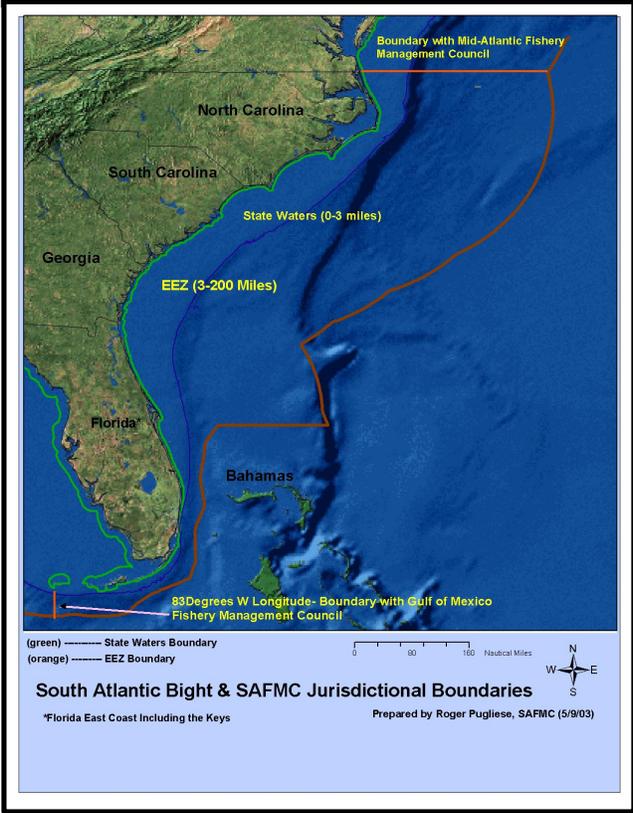


Figure 1.3.1. Jurisdictional boundaries of the South Atlantic Council.

1.4 Purpose and need statement

Purpose for Actions

The *purpose* of this amendment is to update the acceptable biological catch, annual catch limit, maximum sustainable yield, minimum stock size threshold, optimum yield, and revise management measures for the mutton snapper component of the snapper grouper fishery based on the results of the most recent stock assessment.

Need for Actions

The *need* for the amendment is to base mutton snapper management measures on the best scientific information available in order to achieve and maintain optimum yield and to prevent overfishing while minimizing, to the extent practicable, adverse social and economic effects.

1.5 What is the history of management for mutton snapper?

Snapper grouper regulations in the South Atlantic were first implemented in 1983. **Table 1.5.1** provides a summary of regulations affecting mutton snapper since 1992. Refer to **Appendix C** for the management history of the snapper grouper fishery.

Table 1.5.1. Management actions pertaining to mutton snapper in the South Atlantic.

Management Action	Amendment	Effective date
-Minimum size limit of 12 inches total length (TL) for mutton snapper -During May and June each year, possession is limited to aggregate (10 snapper excluding vermilion and only 2 can be red snapper) -Use of longlines inside of 50 fathoms is prohibited	Amendment 4	January 1992
-Minimum size limit increased to 16 inches TL -No longlines south of St. Lucie Inlet, fork length (FL)	Amendment 7	January 1995
-Limited entry program for snapper grouper fishery	Amendment 8	August 1998
-MSY proxy for mutton = 30% static spawning potential ratio; OY proxy is 40% static spawning potential ratio; MSST = $1-M \cdot B_{MSY}$	Amendment 11	December 1999
Specify acceptable biological catch, jurisdictional allocation (Gulf & South Atlantic), ACLs, sector allocations, recreational ACT, and accountability measures	Comprehensive ACL Amendment	April 2012

1.6 What are annual catch limits and accountability measures and why are they required?

A reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) in 2007 required implementation of new tools to end and prevent overfishing to achieve the optimum yield (OY) from a fishery. The tools are annual catch limits (ACL) and accountability measures (AM). An ACL is the level of annual catch of a stock that, if met or exceeded, triggers some corrective action. The AMs are the corrective action, and they are management controls to prevent ACLs from being exceeded and to correct overages of ACLs if they occur. Two examples of AMs include an in-season closure if catch is projected to reach the ACL and reducing the ACL in the following fishing year by an overage that occurred the previous fishing year. Amendment 41 includes alternatives that would revise the current ACLs for mutton snapper. The South Atlantic Council took action in Amendment 34 to the Snapper Grouper FMP (SAFMC 2015a) to enhance the effectiveness of the AMs for mutton snapper.

1.7 How does the South Atlantic Council determine the annual catch limits?

ACLs are derived from the overfishing limit (OFL) and the acceptable biological catch (ABC) (**Figure 1.7.1**). The South Atlantic Council's Scientific and Statistical Committee (SSC) determines the OFL from the stock assessment and the ABC (based on the South Atlantic Council/SSC's ABC control rule) and recommends those to the South Atlantic Council. The OFL is an estimate of the catch level above which overfishing is occurring. 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.

Definitions

Annual Catch Limits (ACL)

The level of annual catch (pounds or numbers) that triggers accountability measures to ensure that overfishing is not occurring.

Annual Catch Targets (ACT)

The level of annual catch (pounds or numbers) that is the management target of the fishery, and accounts for management uncertainty in controlling the actual catch at or below the ACL.

Accountability Measures (AM)

Management controls to prevent ACLs, including sector ACLs, from being exceeded, and to correct or mitigate overages of the ACL if they occur.

Allocations

A division of the overall ACL among sectors (e.g., recreational and commercial) to create sector ACLs.

Maximum Sustainable Yield (MSY)

Largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions.

Optimum Yield (OY)

The amount of catch that will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

Minimum Stock Size Threshold (MSST)

A status determination criterion. If current stock size is below MSST, the stock is overfished.

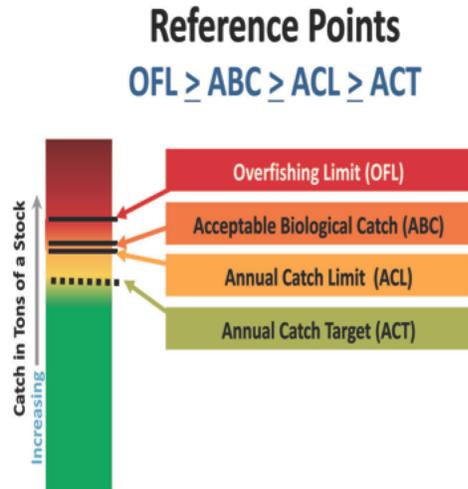


Figure 1.7.1. The relationship of the reference points to each other.

The Magnuson-Stevens Act National Standard 1 (NS 1) guidelines establish the relationship between conservation and management measures, preventing overfishing, and achieving OY from each stock, stock complex, or fishery. (See 50 C.F.R. § 600.310) The NS 1 guidelines discuss the relationship of the OFL to the maximum sustainable yield (MSY) and ACL to OY. The OFL is an annual amount of catch that corresponds to the estimate of maximum fishing mortality threshold applied to a stock; MSY is the long-term average of such catches. The ACL is the limit that triggers AMs and is the management target for the species. Management measures for a fishery should, on an annual basis, prevent the ACL from being exceeded. The long-term objective is to achieve OY through annual achievement of an ACL. The NS 1 guidelines state that if OY is set close to MSY, the conservation and management measures in the fishery must have very good control of the amount of catch to achieve the OY without overfishing.

The updated framework procedure included in the Snapper Grouper FMP allows for the timely establishment and adjustment of ACLs if the South Atlantic Council and the National Marine Fisheries Service determine they are necessary.

The NS 1 guidelines recommend a performance standard by which the efficacy of any system of ACLs and AMs can be measured and evaluated. According to the guidelines:

If catch exceeds the ACL for a given stock or stock complex more than once in the last four years, the system of ACLs and AMs should be re-evaluated, and modified if necessary, to improve its performance and effectiveness (50 C.F.R. § 600.310(g)(7)).

If an evaluation concludes that the ACL is chronically exceeded for any one species or species group, and post-season AMs are repeatedly needed to correct for ACL overages, adjustments to management measures would be made. As stated previously, the updated framework procedure in the Snapper Grouper FMP could be utilized to modify management measures such as bag limits, trip limits, seasonal closures, and gear prohibitions in a timely

manner. Using the regulatory amendment process to implement such changes, if needed, is the timeliest method of addressing issues associated with repeated ACL overages through permanent regulations.

The improved commercial monitoring mechanisms now in place in the South Atlantic Region is expected to reduce the likelihood of commercial ACL overages. The NMFS Commercial Landings Monitoring (CLM) system came online in June 2012 and is now being used to track commercial landings of federally managed fish species. The CLM system can track dealer reporting compliance with a direct link to the permits database at the NMFS Southeast Regional Office. Additionally, the Joint Seafood Dealer Reporting Amendment (GMFMC & SAFMC 2013b), which became effective on August 7, 2014, requires electronic reporting, increases required reporting frequency for dealers to once per week, and requires a single dealer permit for all finfish dealers in the Southeast Region. The CLM system and actions in the Joint Seafood Dealer Reporting Amendment are expected to provide more timely and accurate data reporting and would thus reduce the incidence of quota overages.

Harvest monitoring efforts in the recreational sector are also improving in the South Atlantic Region. On January 27, 2014, regulations became effective requiring headboats to report their landings electronically once per week (Generic Headboat Amendment, GMFMC & SAFMC 2013a). The Southeast Fisheries Science Center is also developing an electronic reporting system for commercial vessels operating in the Southeast Region, and the Gulf of Mexico and South Atlantic Councils have approved amendments that would require electronic reporting for charterboats with a set reporting frequency.

1.8 What is the acceptable biological catch recommendation for mutton snapper?

An update to the stock assessment for mutton snapper in the southeastern U.S. (SEDAR 15A Update 2015) was conducted in 2015 with data through 2013. The SSC reviewed the results at their April 28-30, 2015, meeting and made fishing level recommendations for mutton snapper in the South Atlantic and Gulf of Mexico (**Tables 1.8.1-1.8.3**). The SEDAR 15A Update (2015) resulted in lower biological reference point values and fishing level projections than those from the original assessment (SEDAR 15A 2008). The methodologies used in the two assessments are different, making direct comparisons difficult. A few items were noted that could have contributed to the differences: the Marine Recreational Information Program (MRIP)-calibrated landings used in the update are very different (especially in the early years of the time series) from the landings stream in the original assessment. Also, the update included more years of data (seven years) than what a typical update usually includes. In addition, the original assessment was done with few samples for growth and reproductive parameters. In short, there are probably numerous factors contributing to the difference in the reference points and the projected levels of catch from the assessments. Due to the life history of mutton snapper, there can be hyper-stability in the indices of abundance; that is, because the bulk of the landings occur in May and June when mutton snapper are aggregated to spawn, the catch per unit effort fluctuates little. This may lead to the false assumption that catches are sustainable over the long

term. Also, this type of harvest affects recruitment and proactive management measures may be needed to prevent overfishing.

Table 1.8.1. Stock status recommendations for mutton snapper from SEDAR 15A Update (2015).

Criteria	Deterministic	Probabilistic
Overfished evaluation	Not overfished: $SSB/SSB_{F_{30\%}}=1.13$	
Overfishing evaluation	Not overfishing: $F/F_{30\%SPR}=0.65$	
MFMT ($F_{30\%SPR}$)	0.18	
$SSB_{30\%SPR}$ (lbs females)	4,649,200	
MSST (lbs females)	4,137,700	
Y at $F_{30\%SPR}$ (MSY proxy, lbs)	912,500	
Y at $F_{40\%SPR}$ (lbs)	874,000	
ABC Control Rule Adjustment		20%
P-Star		30%

Table 1.8.2. OFL recommendations for mutton snapper recommendations from SEDAR 15A Update (2015).

Year	OFL RECOMMENDATIONS					
	Landings (lbs)	Discards (lbs)	Catch (lbs)	Landings (numbers)	Discards (numbers)	Catch (numbers)
2017	751,711	55,962	807,673	164,150	29,660	193,810
2018	793,823	56,994	850,817	173,656	30,071	203,727
2019	835,318	58,170	893,488	180,716	30,430	211,146
2020	850,077	58,857	908,934	184,868	30,780	215,648

Table 1.8.3. ABC recommendations for mutton snapper recommendations from SEDAR 15A Update (2015) and the SSC. ABC would be specified based on landing projections in numbers of fish. The South Atlantic Council's apportionment is 82% of the ABC.

Year	ABC RECOMMENDATIONS ($P^* = 0.30$)					
	Landings (lbs)	Discards (lbs)	Catch (lbs)	Landings (numbers)	Discards (numbers)	Catch (numbers)
2017	717,200	53,700	770,900	157,500	28,400	185,900
2018	746,800	53,900	800,700	164,500	28,300	192,800
2019	774,400	54,400	828,800	169,300	28,300	197,600
2020	798,300	54,500	852,800	172,700	28,300	201,000

The Comprehensive ACL Amendment (SAFMC 2011c) established a jurisdictional allocation between the South Atlantic Council and Gulf of Mexico Fishery Management Council (Gulf Council) for the mutton snapper ABC. The jurisdictional allocation was based on landings which are allocated to each Council using the Monroe (Florida Keys) County boundary². The South Atlantic Council was allocated 82% of the ABC and the Gulf Council received 18% of the ABC (established using 50% of average landings from 1990-2008 + 50% of average landings from 2006-2008) (Table 1.8.4). The current commercial ACL (17.023851%) is 157,743 lbs ww and the recreational ACL (82.976149%) is 768,857 lbs ww. (NOTE: The commercial allocation

² The South Atlantic Council's management jurisdiction extends from the North Carolina-Virginia border through the Florida Keys. See Figure 1.3.1.

in the Comprehensive ACL Amendment was 17.02% and the recreational allocation was 82.98%. However the ACLs that were implemented were calculated using this allocation to six decimal places (17.019965% and 82.980045%) instead of two.

Table 1.8.4. Management benchmarks and allowable fishing levels established through the Comprehensive ACL Amendment (lbs ww).

Parameter	Value
OFL	1,515,300
ABC	926,600
ACL	926,600
Comm ACL	157,707
Rec ACL	768,893
Rec ACT	668,937

The Magnuson-Stevens Act NS 1 guidelines provide a definition of overfishing that allows overfishing to be determined in two ways, by a fishing mortality rate or by a level of catch (see 50 C.F.R § 600.310 (e)(2)(i)(B)). The NS 1 Guidelines provide more detail about these two methods, and require that fishery management plans (FMP) describe which method will be used to determine an overfishing status (see 50 C.F.R. § 600.310 (e)(2)(ii)(A)). The overfishing definition for mutton snapper is addressed in Amendment 37 to the Snapper Grouper FMP (SAFMC, under review).

Chapter 2. Proposed Actions and Alternatives

2.1 Action 1. Specify maximum sustainable yield (MSY) for mutton snapper in the South Atlantic Region

Alternative 1 (No Action). The maximum sustainable yield for mutton snapper in the South Atlantic equals the yield produced by F_{MSY} . $F_{30\%SPR}$ is used as the F_{MSY} proxy. The value is not specified.

Preferred Alternative 2. The maximum sustainable yield equals the yield produced by F_{MSY} or the F_{MSY} proxy. MSY and F_{MSY} are recommended by the most recent SEDAR/SSC.

Alternatives	Equation	F_{MSY}	MSY Values (lbs whole weight)
Alternative 1 (No Action)	MSY equals the yield produced by F_{MSY} . $F_{30\%SPR}$ is used as the F_{MSY} proxy.	$F_{30\%SPR}$	Not specified
Alternative 2 (Preferred)	MSY equals the yield produced by F_{MSY} or the F_{MSY} proxy. MSY and F_{MSY} are recommended by the most recent SEDAR/SSC.	$F_{30\%SPR}$	912,500

Comparison of Alternatives:

MSY is the largest long-term average catch that can be taken from a stock under prevailing ecological and environmental conditions. MSY for snapper grouper species was initially specified in Amendment 11 to the Snapper Grouper FMP (SAFMC 1998). At that time, MSY was unknown for mutton snapper due to a lack of data. When a stock assessment is conducted, the model produces estimates of MSY. However, the South Atlantic Fishery Management Council (South Atlantic Council) did not specify the MSY estimate from the Southeast Data, Assessment, and Review (SEDAR) 15A assessment (2008). Therefore, the South Atlantic Council is taking action through Amendment 41 to the Snapper Grouper FMP to adopt the new definition and value for MSY that resulted from the updated assessment (SEDAR 15A update

2015). Selecting the manner to adopt MSY could allow for subsequent revisions to that value when the stock assessment is updated or a new assessment is performed without the South Atlantic Council having to take action. **Preferred Alternative 2** would provide that option. Under **Alternative 1 (No Action)**, a yield (poundage) for MSY is not specified since one was not specified in Amendment 11 (SAFMC 1998). **Preferred Alternative 2** would allow for periodic adjustments of F_{MSY} and MSY values based on estimates from new assessments without the need for an FMP amendment. As neither alternative under this action would have direct effects on resource harvest or use, biological effects would be neutral. However, **Preferred Alternative 2**, which is recommended in the most recent SEDAR assessment and by the South Atlantic Council's Scientific and Statistical Committee (SSC), has a better scientific basis and thus provides a more solid ground for management actions that have biological, economic, and social implications. A MSY level that reflects the best scientific information available (**Preferred Alternative 2**) is expected to contribute to achieving management goals and minimizing risk of overfishing for mutton snapper, resulting in greater expected long-term benefits to the commercial fleet and recreational fishermen who target mutton snapper than under **Alternative 1 (No Action)**.

The South Atlantic Council's SSC endorsed the guidance provided by the SEDAR 15A Update (2015) regarding MSY; therefore, there are no other alternatives the South Atlantic Council could consider in this action that are reasonable alternatives to setting the MSY for mutton snapper.

2.2 Action 2. Specify minimum stock size threshold (MSST) for mutton snapper in the South Atlantic Region

Alternative 1 (No Action). The minimum stock size threshold for mutton snapper is $SSB_{MSY} ((1-M) \text{ or } 0.5, \text{ whichever is greater})$. The value is not specified. SSB_{MSY} = spawning stock biomass at maximum sustainable yield and M = natural mortality.

Alternative 2. Minimum stock size threshold = 50% of SSB_{MSY}

Preferred Alternative 3. Minimum stock size threshold = 75% of SSB_{MSY}

Alternatives	MSST Equation	M	MSST Values (lbs whole weight)
1 (No Action)	$MSST = SSB_{MSY} ((1-M) \text{ or } 0.5, \text{ whichever is greater})$.	0.11	Not specified
2	$MSST = 50\% \text{ of } SSB_{MSY}$	0.17	2,324,600
3 (Preferred)	$MSST = 75\% \text{ of } SSB_{MSY}$	0.17	3,486,900

Comparison of Alternatives:

MSST is the biomass level below which a stock is considered overfished. MSST for mutton snapper in the South Atlantic is currently specified as $MSST = SSB_{MSY} * ((1-M) \text{ or } 0.5, \text{ whichever is greater})$ where SSB_{MSY} is the spawning stock biomass at the MSY level and M is the natural mortality rate.

The SEDAR 15A (2008) assessment produced a MSST estimate that was not adopted by the South Atlantic Council through a plan amendment; hence, a value has not yet been specified. The assessment update estimated natural mortality for mutton snapper at 0.17. When the natural mortality rate is low, such as less than 0.25, even small fluctuations in biomass due to natural variations not related to fishing mortality may cause a stock to vary between an overfished or rebuilt condition. When a species is identified as overfished, the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires that a plan be implemented to rebuild the stock. The South Atlantic Council changed the definition for MSST through Regulatory Amendment 21 to the Snapper Grouper FMP (SAFMC 2014a) for select snapper grouper species with low natural mortality from $MSST = SSB_{MSY} * ((1-M) \text{ or } 0.5, \text{ whichever is greater})$ to $MSST = 75\% SSB_{MSY}$. Other snapper grouper amendments changed MSST to 75% SSB_{MSY} for snowy grouper, golden tilefish, and red grouper (Amendments 15A (2008a), 15B (2008b), and 24 (2011d), respectively). The snapper grouper species with low natural mortality rates addressed in Regulatory Amendment 21 were red snapper, blueline tilefish, gag, black grouper, yellowtail snapper, vermilion snapper, red porgy, and greater

amberjack. Redefining MSST for these species was done to help prevent unnecessary overfished designations when small drops in biomass are due to natural variation in recruitment or other environmental variables, and ensure that rebuilding plans are applied to stocks when truly appropriate. The estimated natural mortality for mutton snapper from the stock assessment update is within the range of natural mortality values for species addressed in Regulatory Amendment 21 (0.08 – 0.23).

Alternative 1 (No Action) would retain the MSST definition established in Amendment 11 to the Snapper Grouper FMP (SAFMC 1998) for the mutton snapper stock. **Alternative 2** would set the MSST at 50% of the spawning stock biomass at MSY (SSB_{MSY}); whereas, **Preferred Alternative 3** would establish MSST at 75% of SSB_{MSY} . Since **Alternative 1 (No Action)** nearly eliminates the buffer between MSST and SSB_{MSY} for stocks with low natural mortality rates, such as mutton snapper, the stock would never be permitted to fall below SSB_{MSY} without triggering an “overfished” determination and mandatory development of a rebuilding plan. The most biologically conservative alternative is **Alternative 1 (No Action)**; however, under this alternative, development of a rebuilding plan may be required when it is not biologically necessary. The biological benefits of **Alternative 1 (No Action)** would take the form of increased harvest restrictions that would be implemented with the intent to rebuild the stock according to the current MSST threshold criterion. **Alternative 2** would be the least biologically beneficial since it would allow biomass to decrease by 50% before triggering the rebuilding plan requirement. **Preferred Alternative 3** would still require the development of a rebuilding plan if mutton snapper was deemed overfished, but would reduce the risk of requiring a rebuilding plan when decreased biomass was due to natural variations in recruitment.

Like MSY, MSST does not alter the current harvest or use of the resource, and thus would have no direct economic effects on fishery participants and associated industries or communities. Unlike MSY, however, MSST is directly related to actions for rebuilding the stock that would have economic implications. **Alternative 1 (No Action)** lies on the high end of the continuum for potential negative economic effects because it has the highest probability of triggering restrictive rebuilding actions. A likely mitigating factor with **Alternative 1 (No Action)** is the possibility that the required management actions would have adverse economic effects that would not last as long or not be as severe. However, a frequently varying regulatory regime would tend to de-stabilize business planning and fishing decisions, which could have potentially worse economic consequences. The economic implications of **Preferred Alternative 3** and its sub-alternatives may be characterized as falling between **Alternative 1 (No Action)** and **Alternative 2**.

Social effects of revised biological parameters such as MSST for a stock would be associated with both the biological and economic effects of the modified MSST value. Under all alternatives, fishermen could be affected by future restricted access to mutton snapper due to an overfished designation, which could have negative effects on associated fishing businesses and communities. Although **Preferred Alternative 3** is the more restrictive approach to set the MSST than **Alternatives 1 (No Action)** and **2**, it would also be the most likely to trigger a overfished status, which may avoid more severe biological impacts to the stock.

2.3 Action 3. Revise annual catch limits (ACLs) and optimum yield (OY) for mutton snapper in the South Atlantic Region

Alternative 1 (No Action). The current acceptable biological catch for mutton snapper is 926,600 pounds whole weight (lbs ww) based on a jurisdictional allocation for the South Atlantic of 82% of the acceptable biological catch and is set equal to optimum yield and the total annual catch limit. The commercial annual catch limit is 157,743 lbs ww (17.02%) and the recreational annual catch limit is 768,857 lbs ww (82.98%). (*NOTE: The commercial allocation in the Comprehensive ACL Amendment was 17.02% and the recreational allocation was 82.98%. However, the ACLs that were implemented were calculated using this allocation to 6 decimal places instead of 2).*

Preferred Alternative 2. Specify annual catch limits and optimum yield for the South Atlantic using the existing sector allocations (17.02% commercial and 82.98% recreational) and specify the recreational annual catch limit in numbers of fish. The annual catch limits specified for 2020 would remain in place until modified.

Preferred Sub-alternative 2a. ACL = OY = ABC.

Sub-alternative 2b. ACL = OY = 95% ABC.

Sub-alternative 2c. ACL = OY = 90% ABC.

Comparison of Alternatives:

To set the ACL and OY for mutton snapper, the South Atlantic Council may exercise varying degrees of precaution to account for management uncertainty. **Alternative 1 (No Action)** would retain the existing ACL and OY for mutton snapper, which would not adhere to the best scientific information available (SEDAR 15A Update 2015) and, therefore, is not a reasonable alternative. **Preferred Sub-alternative 2a** would set the ACL and OY at the same level as ABC; whereas, **Sub-alternatives 2b** and **2c** would each provide a management uncertainty buffer of 5% and 10%, respectively. **Table 2.3.1** shows proposed commercial (in pounds whole weight; lbs ww) and recreational ACLs (in numbers of fish) for each of the proposed sub-alternatives under **Preferred Alternative 2**. For comparison, **Table 2.3.2** presents average commercial and recreational landings of mutton snapper from 2010 through 2014.

Table 2.3.1. Proposed acceptable biological catch values and annual catch limits for mutton snapper in the South Atlantic based on **Sub-Alternatives 2a (Preferred)-2c**.

Preferred Sub-alt 2a - ACL = OY = ABC						
Year	Total ABC (SA + Gulf) (num)	SA ABC (num)	Yield ABC (lbs)	Comm ACL (lbs)	Comm ACL (num)	Rec ACL (num)
2017	157,500	129,150	587,633	100,015	13,023	116,127
2018	164,500	134,890	612,401	104,231	13,572	121,318
2019	169,300	138,826	634,435	107,981	14,060	124,766
2020	172,700	141,614	654,257	111,354	14,499	127,115

Table 2.3.1. Continued.

Sub-alt 2b - ACL = OY = 95% ABC						
Year	Total ABC (SA + Gulf) (num)	SA ABC (num)	Yield ABC (lbs)	Comm ACL (lbs)	Comm ACL (num)	Rec ACL (num)
2017	157,500	122,693	558,251	95,014	12,372	110,321
2018	164,500	128,146	581,781	99,019	12,893	115,252
2019	169,300	131,885	602,713	102,582	13,357	118,528
2020	172,700	134,533	621,544	105,787	13,774	120,759

Sub-alt 2c - ACL = OY = 90% ABC						
Year	Total ABC (SA + Gulf) (num)	SA ABC (num)	Yield ABC (lbs)	Comm ACL (lbs)	Comm ACL (num)	Rec ACL (num)
2017	157,500	116,235	528,869	90,014	11,721	104,514
2018	164,500	121,401	551,161	93,808	12,215	109,186
2019	169,300	124,943	570,991	97,183	12,654	112,289
2020	172,700	127,453	588,831	100,219	13,049	114,403

NOTE: Refer to **Appendix J** for methodology used to calculate the recreational ACL in numbers of fish.
Source: M. Errigo, SAFMC staff.

Table 2.3.2. Annual and average commercial (lbs ww) and recreational (lbs ww and numbers of fish) landings of mutton snapper for the South Atlantic region, 2010-2014.

Year	Recreational		Commercial	Total
	number	lbs ww	lbs ww	lbs ww
2010	130,249	477,647	74,833	552,480
2011	60,151	251,446	66,160	317,606
2012	86,108	505,583	77,231	582,814
2013	126,241	660,449	75,010	735,459
2014	157,501	538,122	91,173	629,295
Mean	112,050	486,650	76,881	563,531

Positive long-term indirect biological effects would be greater under **Sub-alternatives 2b** and **2c** than under **Preferred Sub-alternative 2a** because they would create a buffer between the ACL/OY and ABC, with **Sub-alternative 2c** setting the most conservative ACL at 90% of the ABC (**Table 2.3.1**). Relative to **Alternative 1 (No Action)**, **Preferred Alternative 2** and its sub-alternatives would have positive indirect effects on the biological environment since they would establish catch limits that are based on the latest scientific information available.

Creating a buffer between the ACL/OY and ABC would provide greater assurance that overfishing is prevented, and the long-term average biomass is near or above the spawning stock biomass at the maximum sustainable yield (SSB_{MSY}). However, the South Atlantic Council's ABC control rule takes into account scientific uncertainty. The Magnuson-Stevens Act National Standard 1 (NS 1) guidelines indicate an ACL may typically be set very close to the ABC. Setting a buffer between the ACL and ABC would be appropriate in situations where there is uncertainty in whether or not management measures are constraining fishing mortality to target levels. An annual catch target (ACT; see **Action 4**), which is not required, can also be set below

the ACL to account for management uncertainty and provide greater assurance overfishing does not occur.

When possible, the South Atlantic Council prefers specifying the recreational ACL in numbers of fish and the commercial ACL in pounds. The rationale is that recreational landings are already tracked in numbers of fish while commercial landings are tracked in pounds. Issues develop, however, when different minimum size limits are considered for management and the commercial and recreational ACLs are in different units. If the minimum size limit is increased, as the South Atlantic Council proposes to do, the average size, and thus weight, of fish harvested would also increase. If the method for converting between an ACL in pounds and an ACL in numbers does not address the change in average weight, the expected increase in the average weight of landed fish could lead to the poundage associated with the ACL specified in numbers exceeding the ACL expressed in pounds. This could also result in a perceived shift in sector allocations when they are compared in the original units across sectors, and if the change in weight landed is great enough, the ABC and overfishing limit in pounds could be exceeded. To avoid these issues, the method described in **Appendix J** was used to specify the ABC (and OY) and the recreational ACL for mutton snapper in numbers of fish. This method is designed to keep the numbers of fish harvested constant while allowing the yield to vary based on the possible change in size selectivity (the probability of fish being retained in a fishing gear as a function of the length of the fish) due to changes in the minimum size limit. Specifying the ABC (and OY) and the recreational ACL in numbers of fish results in a lower risk of exceeding the recreational ACL due to an increase in the minimum size limit.

In general, ACLs that allow for more fish to be landed can result in increased positive economic effects. The ACL does not directly impact a fishery unless harvest increases or the ACL is exceeded, thereby triggering AMs such as closures or other restrictive measures. As such, ACLs that do not restrict harvest in a fishery do not have realized economic effects. For the commercial sector, the immediate, short-term ACLs proposed under the sub-alternatives of **Preferred Alternative 2** are lower than what is specified under **Alternative 1 (No Action)** (**Table 2.3.1**), with **Preferred Sub-alternative 2a** being least restrictive followed by **Sub-alternative 2b**, and **Sub-alternative 2c**. However, it is unlikely that the commercial sector would see a mutton snapper closure due to reaching its ACL, as annual commercial landings of the species are expected to be less (**Table 2.3.2**) than any of the proposed commercial ACLs, assuming commercial fishing behavior does not change. Therefore, there are no expected differences in terms of realized economic effects among the sub-alternatives. For the recreational sector, **Sub-alternative 2c** has the largest anticipated negative economic effect, as it has the lowest recreational ACL compared to the baseline. **Sub-alternative 2b** has less potential for negative economic effects compared to **Sub-alternative 2c** (**Table 4.3.4**). For all sub-alternatives of **Alternative 2**, the ACL is projected to increase in years following 2017, therefore the loss of consumer surplus (CS) is expected to be smaller in these years and the economic effects may even be neutral or turn to a net gain in CS, depending on the observed landings of mutton snapper and the sub-alternative that is chosen.

In terms of social effects, the ACL for any stock does not directly affect resource users unless the ACL is met or exceeded, in which case AMs that restrict or close harvest could negatively impact the commercial fleet, for-hire fleet, and private anglers. AMs can have significant direct

and indirect social effects because, when triggered, can restrict harvest in the current season or subsequent seasons. **Section 3.3.2** describes communities that could be affected by changes to mutton snapper management, particularly in the Florida Keys. Mutton snapper is an important species for the recreational sector in south Florida. Changes to access to mutton snapper could also affect fish houses and restaurants that depend on a steady supply of the fish. However, under current conditions and landings for the mutton snapper portion of the snapper grouper fishery, the proposed ACLs under **Alternative 1 (No Action)** and **Preferred Alternative 2** would not restrict access to the resource because landings have not reached the proposed ACLs under either alternative. Additionally, the ACL for mutton snapper would be based on the most recent stock assessment under **Preferred Alternative 2**, which would be beneficial to fishermen by aligning management with the best available information. Although the sub-alternatives under **Preferred Alternative 2** are expected to have identical effects (minimal) on fishermen because landings have not reached the proposed ACLs in recent years, lower ACLs could restrict access in the future if there is an increase in effort. **Sub-alternative 2c** could result in the lowest ACLs, followed by **Sub-alternative 2b** and **Preferred Sub-alternative 2a**.

2.4 Action 4. Revise recreational annual catch target (ACT) for mutton snapper in the South Atlantic Region

Alternative 1 (No Action). The current annual catch target is 668,906 lbs ww and applies to mutton snapper throughout the South Atlantic Council’s jurisdiction. The annual catch target equals recreational $ACL \cdot (1 - PSE)$ or $ACL \cdot 0.5$, whichever is greater, and where percent standard error (PSE) = 13% = average PSE 2005-2009 (for South Atlantic only).

Preferred Alternative 2. Revise the annual catch target for mutton snapper for the recreational sector and specify it in numbers of fish. The annual catch target for 2020 would remain in place until modified.

Sub-alternative 2a. $ACT = \text{recreational } ACL \cdot (1 - PSE) \text{ or } ACL \cdot 0.5$, whichever is greater.

Year	PSE
2010	10.2
2011	15.2
2012	21.2
2013	15.1
2014	17.9
Average	15.9

Note: PSE = Percent Standard Error. The PSE is a measure of precision presented for recreational estimates. The higher the PSE, the less precise the estimate. The average PSE value for the most recent 5 complete years of recreational data would be used in the equation.

Preferred Sub-alternative 2b. $ACT = 85\%$ recreational ACL.

Sub-alternative 2c. $ACT = 75\%$ recreational ACL

Comparison of Alternatives

The NS1 guidelines recommend the use of ACTs to prevent ACLs from being exceeded. For species without in-season management control, managers may utilize ACTs that are set below ACLs so that catches do not exceed the ACLs. If an ACT is specified as part of the system of AMs for mutton snapper, an ACT control rule that accounts for management uncertainty may be utilized for setting the ACT. The objective for establishing an ACT and related accountability measures (AMs) is to prevent the ACL from being exceeded. In managing the snapper grouper fishery, however, the South Atlantic Council has chosen not to use ACTs to trigger AMs because it is anticipated that improvements in reporting will reduce management uncertainty. Should the South Atlantic Council, in the future, utilize ACTs to manage recreational harvest, these values would already have been specified and become part of the regulations.

Table 2.4.1 shows recreational ACTs for mutton snapper under each of the proposed ACL alternatives from **Action 3**.

Table 2.4.1. Proposed recreational annual catch targets (ACTs) in numbers of fish for proposed sub-alternatives under **Preferred Alternative 2.**

Preferred Sub-alternative 2a (Action 3): ACL = OY = ABC				
Year	Rec ACL (num)	Sub-alt 2a	Pref Sub-alt 2b	Sub-alt 2c
2017	116,127	97,663	98,708	87,095
2018	121,318	102,029	103,121	90,989
2019	124,766	104,928	106,051	93,574
2020 onwards	127,115	106,903	108,048	95,336
Sub-alternative 2b (Action 3): ACL = OY = 95%ABC				
2017	110,321	92,780	93,773	82,741
2018	115,252	96,927	97,965	86,439
2019	118,528	99,682	100,749	88,896
2020 onwards	120,759	101,558	102,645	90,569
Sub-alternative 2c (Action 3): ACL = OY = 90%ABC				
2017	104,514	87,897	88,837	78,386
2018	109,186	91,826	92,809	81,890
2019	112,289	94,435	95,446	84,217
2020 onwards	114,403	96,213	97,243	85,802

Since the ACT is typically set lower and would be reached sooner than the ACL for any given species, using an ACT rather than the ACL as a trigger for AMs in the recreational sector may prevent an ACL overage. This more conservative approach would likely help to ensure that recreational data uncertainties do not cause or contribute to excessive ACL overages for vulnerable species. Using recreational ACTs rather than the ACLs to trigger recreational AMs may not eliminate ACL overages completely; however, using such a strategy for the recreational sector may reduce the need to compensate for very large overages.

The current recreational ACT (**Alternative 1 (No Action)**) for mutton snapper in the South Atlantic Council’s area of jurisdiction is 668,906 lbs ww. Since the South Atlantic Council proposes to specify the recreational ACL for mutton snapper in numbers of fish (**Action 3**), **Alternative 1 (No Action)** is not a practical alternative as there would be no consistency in the units. Further, the ACT under **Alternative 1 (No Action)** is no longer based on the latest scientific information. Because the South Atlantic Council has not employed ACTs in its management strategy for the snapper grouper fishery, the biological effects of **Preferred Alternative 2** and its sub-alternatives would be neutral. Of the sub-alternatives under **Preferred Alternative 2**, **Preferred Sub-alternative 2b** proposes the highest values, and if in the future, AMs were tied to the recreational ACT, they could be triggered more frequently than under **Sub-alternatives 2a** or **2c**. However, as stated previously, recreational ACTs are currently not an active part of the management strategy for snapper grouper species and AMs are in place to ensure that ACLs are not exceeded.

The various ACT alternatives of this action only apply to the recreational sector and are not tied to the AMs; therefore, even if recreational catch or landings were to exceed the ACT, but not the recreational ACL, there would be no early closure or reduced future annual landings in the recreational sector and, consequently, no economic impacts beyond the baseline. However, if in

the future, AMs were tied to the recreational ACT, among the sub-alternatives of **Preferred Alternative 2**, **Preferred Sub-alternative 2b** would allow for the largest recreational landings before triggering an AM, while **Sub-alternative 2c** would allow for the smallest. **Alternative 1 (No Action)** would continue to specify the ACT in weight instead of numbers and would not be based on the best scientific information available since it is not based on the latest stock assessment. **Sub-alternative 2c** provides the largest step-down from the ACL to the ACT and would create the largest potential negative economic effect if set as trigger for the AMs, while **Preferred Sub-alternative 2b** provides the smallest step-down from the ACL to the ACT, thereby leading to the smallest potential negative economic effect. **Sub-alternative 2a** falls in between the other two sub-alternatives.

Establishment of a recreational ACT for mutton snapper would likely have no or little effects on recreational fishermen targeting mutton snapper, unless the South Atlantic Council decides to set the ACT as a trigger for AMs at a later time. Because the ACT is currently used for monitoring only, it is expected that the social effects of **Alternative 1 (No Action)** and the sub-alternatives under **Preferred Alternative 2** would be the same.

2.5 Action 5. Modify the commercial and recreational minimum size limit for mutton snapper in the South Atlantic Region

Alternative 1 (No Action). The minimum size limit for mutton snapper (commercial and recreational) in the South Atlantic region is 16 inches total length.

Alternative 2. Increase the commercial and recreational minimum size limit for mutton snapper in the South Atlantic region to 17 inches total length.

Preferred Alternative 3. Increase the commercial and recreational minimum size limit for mutton snapper in the South Atlantic region to 18 inches total length.

Alternative 4. Increase the commercial and recreational minimum size limit for mutton snapper in the South Atlantic region to 19 inches total length.

Alternative 5. Increase the commercial and recreational minimum size limit for mutton snapper in the South Atlantic region to 20 inches total length.

Comparison of Alternatives

The minimum size limit for mutton snapper in federal waters of the South Atlantic was specified in Amendment 7 to the Snapper Grouper FMP (SAFMC 1995) as 16 inches total length (TL). The SEDAR 15A (2008) stock assessment of mutton snapper cited evidence that 50% of mutton snapper reach sexual maturity between 14 and 18 inches TL (**Section 4.5.1**). More recent scientific information indicates that the size at 50% maturity for male mutton snapper is 16 inches TL and 18 inches TL for females (Sadovy de Mitcheson and Colin 2011). **Alternative 1 (No Action)** would retain the existing minimum size of 16 inches TL in federal waters of the South Atlantic. **Alternatives 2-5** consider one-inch increases up to 20 inches TL, respectively. The South Atlantic Council did not consider decreasing the minimum size limit as that could negatively affect the mutton snapper stock by allowing harvest of individuals that are not yet sexually mature. **Alternative 1 (No Action)** would not be as biologically beneficial as the alternatives considered under this action because it allows harvest of some reproductively immature individuals. **Alternatives 2-5** would impart some biological benefits to the mutton snapper population by allowing more individuals to reach reproductive maturity before being harvested. Of these, **Alternatives 4 and 5** would be more biologically beneficial than **Preferred Alternative 3** or **Alternative 2** as they would presumably encompass all the reproductively active individuals in the population. Hence, biological benefits would be greatest under **Alternative 5** and decrease with each subsequent alternative in diminishing order.

The greater the increase in the minimum size limit from **Alternative 1 (No Action)**, the greater the probability for short-term negative economic effects because both commercial and recreational fishers have to discard larger numbers of fish that are under the minimum size limit. To mitigate for decreased landings, fishers would have to take more trips or longer trips and incur higher associated trip costs. **Alternative 5** would result in the largest decrease in landings

or the largest increase in trip costs, followed in turn by **Alternative 4, Preferred Alternative 3, Alternative 2,** and **Alternative 1 (No Action)**. **Alternative 1 (No Action)** would yield the highest positive, direct, short-term net economic effects compared to **Alternatives 2** through **5**. However, **Alternatives 2-5** would generate larger long-term economic benefits than **Alternative 1 (No Action)** because of improvements of the stock.

A minimum size limit can reduce recreational trip satisfaction if anglers are not able to meet the bag limit. The largest minimum size limit (**Alternative 5**) would be expected to have the highest level of short-term negative effects on angler trips and associated businesses, followed by **Alternative 4, Preferred Alternative 3,** and **Alternative 2**. **Alternative 1 (No Action)** would have the least negative effect on trip satisfaction as any of the minimum size limits proposed under **Alternatives 2-5** may restrict the number of fish that can be landed relative to the status quo.

2.6 Action 6. Designate spawning months during which certain commercial and recreational management measures for mutton snapper should apply in the South Atlantic Region

Alternative 1 (No Action). Seasonal harvest limitations apply to the commercial sector during mutton snapper spawning in May and June each year. There are no comparable seasonal restrictions during May and June that apply to the recreational sector.

Preferred Alternative 2. For regulatory purposes, designate the following as “spawning months.” The remainder of the year would be the “regular season.”

Preferred Sub-alternative 2a. April-June

Sub-alternative 2b. April-July

Sub-alternative 2c. May-July

Comparison of Alternatives:

Amendment 4 to the Snapper Grouper FMP (SAFMC 1991) designated May and June as the months during which stricter commercial regulations would be implemented to prevent overharvesting of mutton snapper spawning aggregations. No management measures were put in place to constrain recreational harvest during those months, however. In recent years, fishermen and law enforcement personnel have approached the South Atlantic Council with concerns about overexploitation of mutton snapper while they are aggregated to spawn. The Florida Fish and Wildlife Conservation Commission (FWC) has received similar comments since 2007. FWC staff has regularly heard comments about reducing recreational bag limits and commercial trip limits. Stakeholders are particularly concerned about how many mutton snapper are harvested during the spawning season. Hence, the South Atlantic Council is coordinating with FWC to implement compatible regulations for mutton snapper in state and federal waters that would address stakeholder concerns and benefit the mutton snapper resource. A necessary step to achieving compatible regulations is to designate the time frame during which more restrictive regulations would apply, i.e., the “spawning months” vs. “regular season.”

There is no “designated” spawning season for mutton snapper by the South Atlantic Council. However, under **Alternative 1 (No Action)**, May and June were recognized as the months during which stricter harvest measures for the commercial sector should be in place to offer some protection to spawning fish. Indeed, as stated in **Section 4.6.1**, studies suggest that these months encompass the peak of the mutton snapper spawning season in south Florida and the Florida Keys. Specifying the months during which specific management measures are to apply would not in itself result in any biological effects. However, alternatives that better align the timeframe of regulations with the biology of the species would indirectly result in beneficial biological effects. In general, **Preferred Alternative 2** (and its sub-alternatives) would result in positive indirect biological effects in that they would lengthen the timeframe during which more restrictive regulations would presumably apply to target protection to spawning individuals. Of these, **Sub-alternative 2b** would indirectly provide the most biological benefit to mutton

snapper in that it encompasses the longest amount of time (4 months) and has the greatest potential of capturing the bulk of mutton snapper spawning activity in the South Atlantic Council's area of jurisdiction. **Preferred Sub-alternative 2a** and **Sub-alternative 2b** would result in regulations taking effect one month earlier than under **Alternative 1 (No Action)** and **Sub-alternative 2c**, possibly imparting some indirect biological benefit in light of changing climate and its observed effect on species' reproductive cycles.

Preferred Alternative 2 does not propose any changes to existing regulations. Consequently, without a change in management measures during the "spawning months," **Alternative 1 (No Action)** and **Preferred Alternative 2** would have the same economic impact. However, if stricter recreational bag limits (**Action 7**) and commercial trip limits (**Action 8**) are put in place during the designated "spawning months," both sectors could experience short-term negative economic effects from the extension of stricter regulations and/or establishment of bag and trip limits during the "regular season." Both **Preferred Sub-alternative 2a** and **Sub-alternative 2c** would extend the "spawning months" by one month and **Sub-alternative 2b** would extend it by two months. It is expected that the longer the designated "spawning months," the larger the adverse economic and social impacts from stricter harvest limits, if they were implemented. Therefore, **Sub-alternative 2b**, which establishes the longest period during which stricter harvest limits would be potentially in effect, would have the largest short-term indirect adverse economic and social impacts and **Alternative 1 (No Action)** would have the smallest short-term adverse economic and social impacts. As indicated in **Figure 3.3.3**, average commercial landings of mutton snapper in July are greater than in April. Consequently, **Sub-alternative 2c** would have larger adverse economic and social impacts for the commercial sector than **Preferred Sub-alternative 2b**. **Preferred Sub-alternative 2b** and **Sub-alternative 2c** are expected to have similar economic and social effects for the recreational sector.

2.7 Action 7. Modify mutton snapper recreational bag limit in the South Atlantic Region

Alternative 1 (No Action). Mutton snapper is part of the aggregate 10 snapper bag limit in the South Atlantic that applies throughout the fishing year. In the South Atlantic, the 10 snapper-per-person-per-day aggregate includes the following snapper species: lane, yellowtail, gray, mutton, queen, blackfin, cubera, and silk. Cubera snapper less than 30 inches total length are included in the 10 fish bag limit. The aggregate 10 snapper bag limit includes a maximum of 2 cubera snapper per person (not to exceed 2 per/vessel) for fish 30 inches total length or larger off Florida. Note: The Gulf of Mexico Fishery Management Council and the State of Florida regulations include mutton snapper in the 10 snapper bag limit.

Alternative 2. Retain mutton snapper within the recreational 10 snapper aggregate bag limit in the South Atlantic, but specify a bag limit for mutton snapper during the “regular season” (i.e., non-spawning months).

Sub-alternative 2a. 4 fish/person/day

Sub-alternative 2b. 5 fish/person/day

Sub-alternative 2c. 10 fish/person/day

Alternative 3. Retain mutton snapper within the recreational 10 snapper aggregate bag limit in the South Atlantic, but specify bag/vessel limits for mutton snapper during the “spawning months.”

Sub-alternative 3a. 2 fish/person/day

Sub-alternative 3b. 3 fish/person/day

Sub-alternative 3c. 10 fish/vessel/day

Sub-alternative 3d. 12 fish/vessel/day

Sub-alternative 3e. No retention

Preferred Alternative 4. Retain mutton snapper within the recreational 10 snapper aggregate bag limit in the South Atlantic, but specify bag limits for mutton snapper within the aggregate bag limit year round.

Sub-alternative 4a. 2 fish/person/day

Sub-alternative 4b. 3 fish/person/day

Preferred Sub-alternative 4c. 5 fish/person/day

Comparison of Alternatives

As mentioned previously, there is stakeholder concern about fishing effort on mutton snapper spawning aggregations despite the healthy status of the mutton snapper stock. In 2010, the Snapper Grouper Advisory Panel (AP) recommended that the South Atlantic Council consider a spawning area closure or a seasonal closure in May and June of each year. Furthermore, the AP recommended that the mutton snapper bag limit be reduced to 3 fish per person per day. The most recent stock assessment of mutton snapper in the southeastern United States (SEDAR 15A Update 2015) indicated that mutton snapper are neither overfished nor experiencing overfishing.

Currently, mutton snapper is part of the 10 snapper aggregate (gray snapper, mutton snapper, yellowtail snapper, cubera snapper, queen snapper, blackfin snapper, silk snapper, and lane snapper). Note: dog snapper and mahogany snapper were removed from the snapper grouper fishery management unit through Amendment 35 to the Snapper Grouper FMP (SAFMC 2015b) effective June 22, 2016. Current management measures for mutton snapper in federal waters of the South Atlantic and the Gulf of Mexico and state waters of Florida are shown in **Table 2.7.1**.

Table 2.7.1. Current recreational mutton snapper fishing regulations in State and Federal waters off Florida and in the Gulf of Mexico, and the South Atlantic (June 2015).

Species	Regulations	State Waters Gulf and South Atlantic	Federal Waters Gulf of Mexico	Federal Waters South Atlantic
Mutton Snapper	Size Limit	16" TL		
	Bag Limit	10 snapper aggregate (per person/day)		
	Season	Year round		

In general, constraining recreational harvest by means of bag limits results in neutral biological effects because the ACL limits overall harvest to a level that is sustainable over the long-term. However, bag limits can be beneficial in managing harvest of species whose biology makes them particularly vulnerable to fishing mortality during part of their life cycle, such as when they are reproducing. As such, **Alternative 3** and its sub-alternatives, which would establish the lowest bag limits, would provide greater biological benefits than **Alternative 1 (No Action)**, **Alternative 2**, and **Preferred Alternative 4**. Among the **Alternative 3** sub-alternatives, **Sub-alternative 3e**, no retention of mutton snapper, would provide the greatest biological benefit since fish would not be subject to fishing mortality while they are in spawning condition. Positive biological effects would also be expected from **Sub-alternatives 3a, 3b, 3c, and 3d**, in that order, as these sub-alternatives would also constrain recreational harvest during the spawning months.

Preferred Alternative 4 and its sub-alternatives propose specifying a mutton snapper bag limit within the 10-snapper aggregate year-round. As shown in **Figure 4.7.1**, from 2010 through 2014, most anglers (private and for-hire modes) caught three or fewer mutton snapper. Therefore, **Preferred Sub-alternative 4c** would have little effect in constraining recreational harvest on its own and essentially be the same as **Alternative 1 (No Action)**. **Sub-alternatives 4a** and **4b** would impart a similar level of biological benefit to the mutton snapper stock as **Sub-alternatives 3a** and **3b** since they would also lower the level of fishing mortality during the spawning months.

Anglers tend to prefer high catch rates and large fish, and a smaller bag limit can reduce their catch rate. However, as shown in **Figure 4.7.1**, few anglers land more than three mutton snappers on a single trip. Therefore, setting the bag limit between 4 and 10 fish per person per day is expected to have minimal negative economic effects, while setting the bag limit at 1, 2, or 3 fish per person per day can be expected to have larger negative economic effects. During the regular season, **Sub-alternatives 2a** and **2b** would be more restrictive than the current bag limit of up to 10 mutton snapper per person/day within the snapper aggregate bag limit, therefore

some negative economic impacts may be expected. **Sub-alternative 2c** would allow the harvest of up to 10 mutton snapper per person/day, which is equivalent to the current bag limit; therefore, no economic effects are expected from this sub-alternative. Vessel limits in **Sub-alternative 3a** through **Sub-alternative 3e** would affect recreational participants only on trips where the vessel limit is more restrictive than the bag limit. The sub-alternatives of **Preferred Alternative 4** would establish a recreational bag limit that would be more restrictive than the current 10 fish per person per day aggregate snapper limit (**Alternative 1 (No Action)**). These sub-alternatives, paired with minimum size limit options from **Action 5**, provide total consumer surplus (CS) estimates for the recreational sector (**Table 4.7.4**). In general, **Preferred Sub-Alternative 4c** has the highest potential CS followed by **Sub-alternative 4b**, with **Sub-alternative 4a** having the lowest estimated potential CS.

In general, the social effects of modifying the recreational harvest limits would be associated with the biological costs of each alternative, as well as the effects on current recreational fishing opportunities. While **Alternatives 2-4 (Preferred)** could further restrict recreational fishing opportunities for mutton snapper beyond status quo (**Alternative 1 (No Action)**), especially under the “spawning months” limits proposed under **Alternative 3**, the harvest limits would also be expected to contribute to long-term benefits to the stock and for future recreational opportunities. **Alternative 1 (No Action)** would be the most beneficial to recreational fishermen in the short-term because it would allow the highest number of mutton snapper to be kept, which may improve recreational trip satisfaction, but could detract from measures aimed at protecting the stock during spawning activity. The limits during the “regular season” (which depends on the potential spawning season designated in **Action 6**) under **Alternative 2** and its sub-alternatives could have negative effects on opportunities to retain mutton snapper. The proposed vessel limits under **Sub-alternatives 3c** and **3d** could have negative effects on recreational fishing opportunities, specifically for headboat businesses with higher numbers of people on board, but would be expected to have long-term benefits to the stock. The most restrictive measure (no retention) under **Sub-alternative 3e** would be the most likely to have short-term negative effects on recreational fishermen and for-hire businesses, but would affect all levels of recreational participation (anglers on private and for-hire vessels) at equal levels. Setting the recreational harvest limits year-round (**Preferred Alternative 4** and its sub-alternatives) would reduce complexity of management measures, which would likely improve compliance. Negative short-term effects due to restrictions on retention of mutton snapper would be expected to increase with lower bag limits.

2.8 Action 8. Modify mutton snapper commercial trip limit in the South Atlantic Region

Alternative 1 (No Action). During May and June, each year, the possession of mutton snapper in or from the exclusive economic zone on board a vessel that has a commercial permit for South Atlantic snapper grouper is limited to 10 per person per day or 10 per person per trip, whichever is more restrictive. There is no possession or trip limit for the commercial sector in the South Atlantic from January through April and July through December.

Preferred Alternative 2. Establish a commercial trip limit for mutton snapper during the “regular season” (i.e., non-spawning months) in the South Atlantic.

Sub-alternative 2a. 300 pounds whole weight

Sub-alternative 2b. 400 pounds whole weight

Preferred Sub-alternative 2c. 500 pounds whole weight

Preferred Alternative 3. Specify a commercial trip limit for mutton snapper during the “spawning months” in the South Atlantic.

Sub-alternative 3a. 2 fish/person/day or 2 fish/person/trip, whichever is more restrictive

Sub-alternative 3b. 3 fish/person/day or 3 fish/person/trip, whichever is more restrictive

Sub-alternative 3c. 10 fish/vessel/day

Sub-alternative 3d. 12 fish/vessel/day

Sub-alternative 3e. No retention

Preferred Sub-alternative 3f. 5 fish/person/day or 5 fish/person/trip, whichever is more restrictive

Comparison of Alternatives

This action considers alternatives for a mutton snapper commercial trip limit in the South Atlantic during the “regular season” (i.e., non-spawning months) and modification of the commercial trip limit during the “spawning months.” Currently, during May and June, the commercial sector in the South Atlantic is restricted to 10 mutton snapper per person per day or 10 mutton snapper per person per trip, whichever is more restrictive. There is no trip limit for the commercial sector during January through April and July through December.

Commercial landings of mutton snapper in the South Atlantic region are highest during the May-June peak spawning period (**Figure 4.8.1**) despite the current restriction on harvest. A commercial trip limit of 500 lbs ww (**Preferred Sub-alternative 2c**) outside of the designated spawning months (April through June according to **Preferred Sub-alternative 2a, Action 6**) is expected to result in a 3.7% decrease in annual commercial harvest of mutton snapper; whereas, the proposed commercial trip limit of 5 fish per person per day during the “spawning months” (**Preferred Sub-alternative 3f**) would reduce commercial harvest of mutton snapper by 13.6%. Therefore, based on analyses detailed in **Section 4.8.1**, the combination of **Preferred Sub-alternative 2c** (500 lbs ww during regular season) and **3f** (5 fish/person/day or 5/person/trip during April-June) of **Action 8** is expected to reduce annual commercial harvest of mutton snapper in the South Atlantic by about 17%.

Trip limits do not generally result in biological effects, positive or negative, since annual harvest is constrained by the ACL to a level that is sustainable over the long-term. Although **Alternative 1 (No Action)** places some level of constraint on commercial harvest of mutton snapper during months of peak spawning, average commercial landings have been highest during May-June indicating that current regulations are ineffective in constraining commercial harvest when the species is most vulnerable; that is, during formation of spawning aggregations. As such, **Preferred Alternative 3** and its sub-alternatives would be more biologically beneficial than **Preferred Alternative 2** and its sub-alternatives since they would presumably reduce harvest when mutton snapper are spawning. Therefore, **Preferred Alternative 3** and its sub-alternatives would likely result in greater biological benefits relative to **Alternative 1 (No Action)**. Among the **Preferred Alternative 3** sub-alternatives, **Sub-alternative 3e** would be the most biologically beneficial to the mutton snapper stock as it would prohibit commercial harvest during the spawning months.

In general, the lower the trip limit, the more likely some commercial vessels would experience negative economic effects. Lower trip limits may reduce net operative revenue for commercial vessels through a reduction in efficiency. The severity of such impacts would be based on the overall dependence a vessel has on mutton snapper and the vessel’s ability to substitute other species to make up for loss of revenue from reduced mutton snapper landings. The sub-alternatives of **Preferred Alternative 2** and its sub-alternatives set trip limits during the “regular season.” The lower the trip limit, the more likely some commercial vessels would experience negative economic effects. Some permit holders are restricted to a 225-pound limit of snapper grouper species and would not be affected by the commercial trip limits in **Preferred Alternative 2** and its sub-alternatives. For the remaining permit holders, negative economic effects may occur due to trip limits proposed under sub-alternatives of **Preferred Alternative 2**; however, these effects are expected to be minimal on most trips, as the vast majority of commercial trips land 300 lbs ww or less of mutton snapper per trip (**Figure 4.8.3**). **Sub-alternative 2a** sets the lowest trip limit and is expected to have the largest negative, short-term economic effect followed by **Sub-alternative 2b** and **Preferred Sub-alternative 2c**.

The sub-alternatives of **Preferred Alternative 3** set trip limits during the designated “spawning months” (**Action 6**). The realized severity of such impacts on a commercial trip

would be based on the overall dependence a vessel has on mutton snapper, the ability of the vessel to exceed the current trip limit specified during May and June in **Alternative 1 (No Action)**, and the vessel's ability to substitute other species to make up for loss of revenue from reduced mutton snapper landings. In comparison to **Alternative 1 (No Action)**, **Sub-alternative 3e** specifies no retention during the "spawning months" and is expected to have the largest negative, short-term economic effect followed by **Sub-alternative 3a**, **Sub-alternative 3b**, **Preferred Sub-alternative 3f**, **Sub-alternative 3c**, and **Sub-alternative 3d**.

The social effects of establishing a trip limit during "non-spawning" months (**Preferred Alternative 2**) would depend on the level of landings of mutton for commercial trips in recent years. In general, most trips land less than 300 lbs ww of mutton snapper, and a large proportion of trips land under 50 lbs ww per trip (**Figure 4.8.3**). This suggests that mutton snapper are part of a varied catch combination on commercial trips. The expected effects on commercial fishermen on trips targeting mutton snapper (likely along with several other species on the same trip) under **Preferred Alternative 2** and its sub-alternatives are expected to be minimal to none. Even with trip limits proposed under **Sub-alternatives 3a-3f (Preferred)**, there would likely be minimal effects on commercial fishermen on trips targeting mutton snapper (likely as part of multi-species trips). **Sub-alternative 3e** would be the most restrictive and could have negative effects on commercial vessels if mutton snapper is a primary target species, but would not be expected to have more than minimal effects for most commercial fishermen. The lower vessel limits would have more negative effects for vessels with more people on board; so (after no retention under **Sub-alternative 3e**) **Sub-alternative 3a** could have the most negative effects due to restrictions on the number of fish that can be landed, followed by **Sub-alternative 3b**, **Preferred Sub-alternative 3f**, **Sub-alternative 3c**, and **Sub-alternative 3d**. However, under current fishery conditions, it is likely that only a trip limit that would result in 4 or less fish per vessel per trip (**Sub-alternatives 3a** and **3b**) could have negative effects on commercial fishermen, and those effects would be minimal effects.

Chapter 3. Affected Environment

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

- **Habitat environment** (Section 3.1)
- **Biological and Ecological environment** (Section 3.2)
- **Economic and Social environment** (Sections 3.3)
- **Administrative environment** (Section 3.4)

3.1 Habitat Environment

3.1.1 Inshore/Estuarine Habitat

Many snapper grouper species utilize both pelagic and benthic habitats during several stages of their life histories; larval stages of these species live in the water column and feed on plankton. Most juveniles and adults are demersal (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 daytime feeding migrations or seasonal shifts in cross-shelf distributions. Additional information on the habitat utilized by species in the Snapper Grouper Complex is included in Volume II of the Fishery Ecosystem Plan (FEP; SAFMC 2009b) and incorporated here by reference. The FEP can be found at: <http://safmc.net/ecosystem-management/fishery-ecosystem-plan/>. The life history of mutton snapper is summarized in **Section 3.2.1**.

3.1.2 Offshore Habitat

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 55 meters (54 to 180 ft) or greater for live-bottom habitats, 55 to 110 meters (180 to 360 ft) for the shelf-edge habitat, and from 110 to 183 meters (360 to 600 ft) for lower-shelf habitat areas.

The exact extent and distribution of productive snapper grouper habitat in South Atlantic continental shelf habitats is unknown. Current data suggest from 3% to 30% of the shelf is suitable habitat for these species. These live-bottom habitats may include low relief areas, supporting sparse to moderate growth of sessile (permanently attached) invertebrates, moderate relief reefs from 0.5 to 2 meters (1.6 to 6.6 ft), or high relief ridges at or near the shelf break consisting of outcrops of rock that are heavily encrusted with sessile invertebrates such as sponges and sea fan species. Live-bottom habitat is scattered irregularly over most of the shelf north of Cape Canaveral but is most abundant offshore from northeastern Florida. South of Cape Canaveral the continental shelf narrows from 56 to 16 kilometers (35 to 10 mi) wide off the southeast coast of Florida and the Florida Keys. The lack of a large shelf area, presence of extensive, rugged living fossil coral reefs, and dominance of a tropical Caribbean fauna are distinctive benthic characteristics of this area.

Rock outcroppings occur throughout the continental shelf from Cape Hatteras, North Carolina to Key West, Florida (MacIntyre and Milliman 1970; Miller and Richards 1979; Parker et al. 1983), which are principally composed of limestone and carbonate sandstone (Newton et al. 1971), and exhibit vertical relief ranging from less than 0.5 to over 10 meters (33 ft). Ledge systems formed by rock outcrops and piles of irregularly sized boulders are also common. Parker et al. (1983) estimated that 24% (9,443 km²) of the area between the 27 and 101 meter (89 and 331 ft) depth contours from Cape Hatteras, North Carolina to Cape Canaveral, Florida is reef habitat. Although the bottom communities found in water depths between 100 and 300 meters (328 and 984 ft) from Cape Hatteras, North Carolina to Key West, Florida is relatively small compared to the whole shelf, this area, based upon landing information of fishers, constitutes prime reef fish habitat and probably significantly contributes to the total amount of reef habitat in this region.

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 un-vegetated areas of little or no relief. There are several notable shipwrecks along the southeast coast in state and federal waters including *Lofthus* (eastern Florida), *SS Copenhagen* (southeast Florida), *Half Moon* (southeast Florida), *Hebe* (Myrtle Beach, South Carolina), *Georgiana* (Charleston, South Carolina), *U.S.S. Monitor* (Cape Hatteras, North Carolina), *Huron* (Nags Head, North Carolina), and *Metropolis* (Corolla, North Carolina).

The distribution of coral and live hard bottom habitat as presented in the Southeast Marine Assessment and Prediction Program (SEAMAP) bottom mapping project is a proxy for the distribution of the species within the snapper grouper complex. The method used to determine hard bottom habitat relied on the identification of reef obligate species including members of the snapper grouper complex. The Florida Fish and Wildlife Research Institute (FWRI), using the best available information on the distribution of hard bottom habitat in the South Atlantic region, prepared ArcView maps for the four-state project. These maps, which consolidate known distribution of coral, hard/live bottom, and artificial reefs as hard bottom, are available on the South Atlantic Council's online map services provided by the newly developed SAFMC Habitat and Ecosystem Atlas: http://ocean.floridamarine.org/safmc_atlas/. An introduction to the system is found at: <http://www.safmc.net/ecosystem-management/mapping-and-gis-data>.

Plots of the spatial distribution of offshore species were generated from the Marine Resources Monitoring, Assessment, and Prediction Program (MARMAP) data. The plots serve as point confirmation of the presence of each species within the scope of the sampling program. These plots, in combination with the hard bottom habitat distributions previously mentioned, can be employed as proxies for offshore snapper grouper complex distributions in the South Atlantic region. Maps of the distribution of snapper grouper species by gear type based on MARMAP data can also be generated through the South Atlantic Council's Internet Mapping System at the above address.

Additional information on the habitat utilized by snapper grouper species is included in Volume II of the Fishery Ecosystem Plan (FEP; SAFMC 2009b). The FEP can be found at: <http://safmc.net/ecosystem-management/fishery-ecosystem-plan/>.

3.1.3 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. Specifically, estuarine/inshore EFH includes: Estuarine emergent and mangrove wetlands, submerged aquatic vegetation, oyster reefs and shell banks, intertidal flats, palustrine emergent and forested systems, aquatic beds, and estuarine water column. Additionally, marine/offshore EFH includes: live/hard bottom habitats, coral and coral reefs, artificial and manmade reefs, *Sargassum* species, and marine water column.

EFH utilized by snapper grouper species in this 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 ft (but to at least 2,000 ft for wreckfish)] where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical fish complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for survival of larvae and growth up to and including settlement. In addition, the Gulf Stream is also EFH because it provides a mechanism to disperse snapper grouper larvae.

For specific life stages of estuarine-dependent and near shore snapper grouper species, EFH includes areas inshore of the 30 meter (100-ft) 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 habitats.

3.1.4 Habitat Areas of Particular Concern

Areas which meet the criteria for Essential Fish Habitat-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; South Atlantic Council-designated Artificial Reef Special Management Zones (SMZs); and deepwater Marine Protected Areas (MPAs). Areas that meet the criteria for EFH-HAPCs include habitats required during each life stage (including egg, larval, postlarval, juvenile, and adult stages).

In addition to protecting habitat from fishing related degradation through fishery management plan regulations, the South Atlantic Council, in cooperation with NMFS, actively comments on non-fishing projects or policies that may impact essential fish habitat. With guidance from the Habitat Advisory Panel, the South Atlantic Council has developed and approved policies on: energy exploration, development, transportation and hydropower re-licensing; beach dredging and filling and large-scale coastal engineering; protection and enhancement of submerged aquatic vegetation; alterations to riverine, estuarine and near shore flows; offshore aquaculture; and marine and estuarine invasive species.

The potential impacts the actions in this amendment may have on EFH, and EFH-HAPCs are discussed in **Chapter 4** of this document.

3.2 Biological and Ecological Environment

3.2.1 Fish Populations Affected by this Amendment

The reef environment in the South Atlantic management area affected by actions in this environmental impact statement is defined by two components (**Figure 3.2.1**). Each component will be described in detail in the following sections.

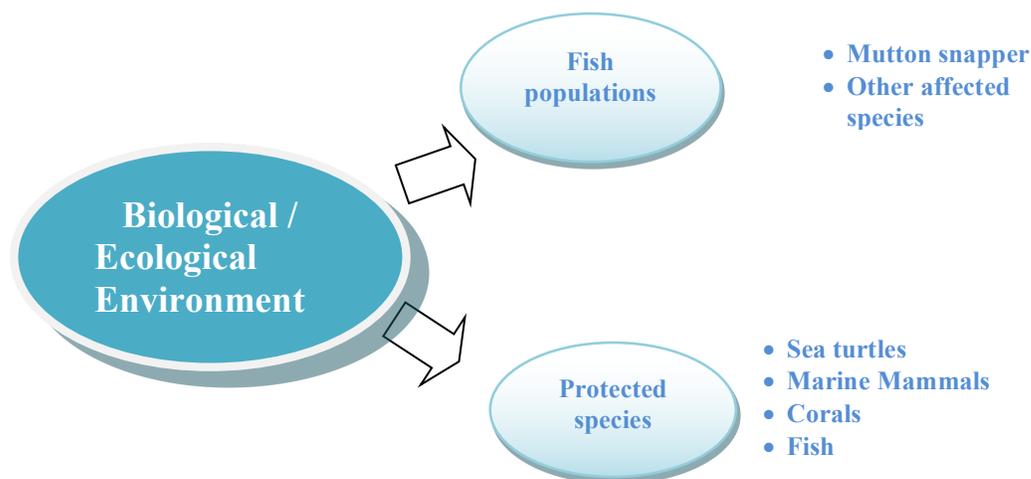


Figure 3.2.1. Two components of the biological environment described in this document.

The waters off the South Atlantic coast are home to a diverse population of fish. The snapper grouper fishery management unit contains 55 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 (e.g., 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 (e.g., 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 dictates the nature of the fishery (multi-species) and further forms the type of management regulations proposed in this document.

Mutton Snapper

Life history, biological characteristics, and stock status information for mutton snapper may be found the Southeast Data, Assessment, and Review (SEDAR) report, SEDAR 15A Update (2015), which is available on the SEDAR web site <http://www.sefsc.noaa.gov/sedar/> and is hereby incorporated by reference (see **Section 3.2.3** for more information on the SEDAR process).

Life History

Mutton snapper are distributed from the United States south to Brazil including Bermuda, the Gulf of Mexico, and the Caribbean (Burton 2002, Faunce et al. 2007). Mutton snapper occur on the continental shelf areas as well as in clear waters around islands. The species forms small aggregations that disband during the night (Allen 1985). Mutton snapper feed both during the day and at night on fishes, shrimps, crabs, cephalopods, and gastropods (Allen 1985). Common names in English include mutton snapper, mutton fish, king snapper, virgin snapper, snapper, and in Spanish include pargo, pargo cebado, pargo cebal, pargo colorado, pargo criollo (Cuba), pargo mulato, and sama (Murray and Bester 2007). The maximum observed age for mutton snapper is 40 years with a maximum size of 96 cm total length (Faunce et al. 2007).

Mutton snapper exhibit spatial separation of adult and juvenile members of the local population. After a pelagic larval period of approximately 31 days, mutton snapper settle onto a suite of available habitats including, nearshore vegetated habitats such as seagrass beds less than 10 m deep (Lindeman et al. 2000). Juveniles are abundant in shallow waters such as tidal mangrove creeks, canals, and shallow protected bays, utilizing turtle grass as bottom cover (Allen 1985). Large adults are found in or near offshore reef and rock rubble habitats. Once adult mutton snapper become established in an area, they tend to remain there. Small aggregations of mutton snapper may form during the day, disbanding at night. These fish may be found at depths ranging from 80-310 feet (25-95 m) (Murray and Bester 2007). They are solitary and wary fish, rarely found in groups or schools except during spawning aggregations (Domeier et al. 1996).

Mutton snapper are known to form aggregations when they spawn (Figuerola et al. 1997). Burton et al. (2005 and references therein) indicate that mutton snapper spawning occurs from May through July at Riley's Hump and peaks in June, as indicated by gonadosomatic indices (M. L. Burton, unpubl. data). Fish begin to aggregate for spawning around the full moon (Burton et al. 2005). Individuals have been observed in spawning condition in the U.S. Caribbean from February through July (Erdman 1976). Some spawning occurs during February to June off Puerto Rico, but spawning peaks during the week following the full moon in April and May. Spawning aggregations are known to occur north of St. Thomas, USVI, and south of St. Croix, USVI, in March, April, and May (Rielinger 1999). Spawning has also been reported from the Turks and Caicos, Florida, the Bahamas, and Cuba (Burton 2002, Barbieri and Colvocoresses 2003, Claro and Lindeman 2003). Garcia-Cagide et al. (2001) and Claro and Lindeman (2003), place peak spawning 6-7 days after the full moon during May and June. Sexual maturity occurs at 40 cm fork length (FL; 16 inches) among males

Mutton snapper Life History *An Overview*



- Extend from Brazil to Massachusetts, including the Gulf of Mexico and Caribbean Sea.
- Adults are typically associated with hard bottom and reef habitats, as deep as 95 m, with juveniles in nearshore estuaries, tidal mangrove creeks, canals, and seagrass beds.
- Form spawning aggregations.
- The spawning season extends from February to July, with a peak in activity during May and June.
- Oldest fish reported is 40 years old.

and 46 cm FL (18 inches) among females (Sadovy de Mitcheson and Colin 2011 and references therein).

Graham et al. (2008) report evidence of a significant decline in catch-per-unit effort, mean landings and inter-annual median lengths of mutton snapper in Belize, due to overexploitation at a spawning aggregation in Gladden Spit. The authors suggest that “a precautionary approach to spawning aggregation management is warranted that provides full protection from fishing to enhance population persistence. The findings also highlight the need for substantially greater enforcement and long-term fisheries monitoring under a comprehensive regional management strategy.” Mutton snapper was listed as “vulnerable” in the 2015 IUCN red list of threatened species (<http://www.iucnredlist.org/details/12416/0>).

Little is documented regarding the seasonal migrations of mutton snapper along coastlines. Fishermen in Martin County, Florida, note a spike in catch rates during the Fall (November) and Winter (February) that may be related to the latitudinal movement of fishes into the region (B. Hartig, B. Taylor pers. com.). Perhaps the most significant movement patterns of mutton snapper occurs during the summer, when normally solitary individuals aggregate during days and weeks of travel time to specific locations that persist from days to two weeks throughout the Caribbean (Domeier and Colin 1997). In Florida, Lindeman et al. (2000) reported 22 locations identified by fishermen in the lower Keys that may serve as spawning aggregations for snapper; only three of which were particular to mutton snapper. Claro and Lindeman (2003) report nine snapper spawning locations in Cuba, four of which were used by mutton snapper.

Faunce et al. (2007) considered mutton snapper in the southeastern U.S. to be a single stock. The strong Caribbean Loop, and Gulf Stream currents of the region are sufficient to maintain a homogenous population at the genetic level (Shulzitski et al. 2005). A recent study (Carson et al. 2011) of the genetics of mutton snapper from the Florida Keys, Puerto Rico, and the U.S. Virgin Islands supported the single stock hypothesis.

Stock Status

Mutton snapper in the South Atlantic and the Gulf of Mexico are considered to belong to a single stock. The stock was assessed through SEDAR 15A (2008) with data through 2006. Snapper Grouper Amendment 11 (SAFMC 1998) and the Generic Annual Catch Limits/Accountability Measures Amendment (GMFMC 2011) specified $F_{30\%}$ as a proxy for F_{MSY} and the corresponding yield as a proxy for maximum sustainable yield, and specified the yield at $F_{40\%}$ as a proxy for the acceptable biological catch (ABC). The SEDAR 15A (2008) Assessment Workshop panel did not recommend changing any of the management criteria for mutton snapper. The mutton snapper stock was determined to not be overfished nor was it undergoing overfishing at that time. From the SEDAR 15A (2008) report: *The stock status ratios from the base run were $F_{2006}/F_{30\%} = 0.51$ and $SSB_{2006}/SSB_{F30\%} = 1.14$. Using the current status criteria, the base run indicates the stock was neither undergoing overfishing nor was the stock overfished in 2006, but sensitivity runs indicate that there is a moderate probability that the stock could be overfished. The general increase in the recreational fishing mortality rate adds to the concern.*

An update assessment was conducted in 2015 with data through 2013 (SEDAR 15A Update). The update results showed that mutton snapper in the South Atlantic and Gulf of Mexico were

neither overfished nor undergoing overfishing. From the SEDAR 15A Update (2015): *The current fishing mortality rate of fully selected ages expressed as the geometric mean of the rates from 2011, 2012, and 2013 was 0.12 per year and the Maximum Fishing Mortality Threshold (MFMT) was 0.18 per year which was defined as the fishing mortality rate associated with a spawning potential ratio of 30% (GMFMC and SAFMC 2011) such that mutton snapper was not undergoing overfishing. The spawning biomass in 2013 was 2,387 mt and the biomass at MFMT was 2,109 mt such that mutton snapper were not overfished. The Overfishing Limit (OFL) was defined as the yield associated with the MFMT and the value from the base run was 413,900 mt (912,500 lb) and the Acceptable Biological Catch (ABC) was the yield at a fishing mortality rate associated with a spawning potential ratio of 40% and the value from the base run was 396,400 mt (874,000 lb).*

The SEDAR 15A Update (2015) resulted in lower biological reference points and fishing level projections than those from the original assessment (SEDAR 15A 2008). The methodologies used in the two assessments are very different making direct comparisons difficult, however. A few items were noted that could have contributed to the differences: the Marine Recreational Information Program (MRIP)-calibrated landings used in the update are very different (especially in the early years of the time series) from the landings stream in the original assessment. Also, the update included several more years of data (7 years) than what a typical update usually includes. In addition, the original assessment was done with few samples for growth and reproductive parameters. In short, there are probably numerous factors contributing to the difference in the reference points and projected levels of catch. Because of its life history, there can be hyper-stability in the indices of abundance: because the bulk of the landings are happening in May and June when mutton are forming spawning aggregations, the catch per unit effort fluctuates little and this may lead to the assumption that catches are sustainable over the long term when in fact they are not. Also, recruitment is affected by this type of harvest and proactive management measures are needed to prevent overfishing.

3.2.2 Bycatch

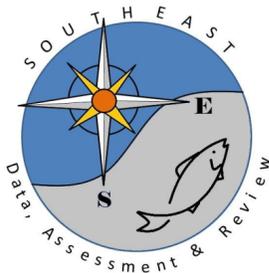
As summarized in **Appendix D**, the Bycatch Practicability Analysis (BPA), the actions in Amendment 41 are not expected to result in significant changes in bycatch of mutton snapper. In addition, the South Atlantic Council, the National Marine Fisheries Service (NMFS), and the Southeast Fisheries Science Center (SEFSC) have implemented and plan to implement numerous management measures and reporting requirements that have improved, or are likely to improve monitoring efforts of discards and discard mortality. Therefore, no additional action is needed to minimize bycatch or bycatch mortality within the snapper grouper fishery. See **Appendix D** for detailed descriptions of bycatch when fishing for mutton snapper.

3.2.3 Other Species Affected

Three species constitute the majority of snapper (Family Lutjanidae) targeted by fishermen in nearshore waters of Florida: the lane snapper (*Lutjanus synagris*), gray snapper (*Lutjanus griseus*), and mutton snapper (*Lutjanus analis*). Mutton snapper achieve the largest body size of these snappers, and represent a valuable fishery resource.

For details on the life histories and ecology of co-occurring species, the reader is referred to Volume II of the Fishery Ecosystem Plan (SAFMC 2009b) available at: <http://safmc.net/ecosystem-management/fishery-ecosystem-plan/>.

3.2.4 The Stock Assessment Process



The Southeast Data, Assessment, and Review (SEDAR) process is a cooperative Fishery Management Council initiative to improve the quality and reliability of fishery stock assessments in the South Atlantic, Gulf of Mexico, and U.S. Caribbean. The Caribbean, Gulf of Mexico, and South Atlantic Fishery Management Councils manage SEDAR in coordination with the National Marine Fisheries Service (NMFS) and the Atlantic and Gulf States Marine Fisheries Commissions. SEDAR seeks improvements in the scientific quality of stock assessments, constituent and stakeholder participation in assessment development, transparency in the assessment process, and a rigorous and independent scientific review of completed stock assessments.

SEDAR is organized around three workshops. First is the Data Workshop, during which fisheries monitoring and life history data are reviewed and compiled. Second is the Assessment Workshop, which may be conducted via a workshop and several webinars, during which assessment models are developed and population parameters are estimated using the information provided from the Data Workshop. Third and final is the Review Workshop, during which independent experts review the input data, assessment methods, and assessment products. The completed assessment, including the reports of all three workshops and all supporting documentation, are then forwarded to the South Atlantic Council's Scientific and Statistical Committee (SSC). The SSC considers whether the assessment represents the best available science and develops fishing level recommendations for South Atlantic Council consideration.

SEDAR workshops are public meetings organized by SEDAR. Workshop participants appointed by the lead Council are drawn from state and federal agencies, non-government organizations, Council members, Council advisors, and the fishing industry with a goal of including a broad range of disciplines and perspectives. All participants are expected to contribute to this scientific process by preparing working papers, contributing data, providing assessment analyses, evaluating and discussing information presented, and completing the workshop report.

3.2.5 Protected Species

There are 49 species, or distinct population segments (DPSs) of species, protected by federal law that may occur in the exclusive economic zone (EEZ) of the South Atlantic Region. Thirty-one of these species are marine mammals protected under the Marine Mammal Protection Act (MMPA) (Wynne and Schwartz 1999, Waring et al. 2013). The MMPA requires that each commercial fishery be classified by the number of marine mammals they seriously injure or kill. NMFS's List of Fisheries (LOF) classifies U.S. commercial fisheries into three categories based

on the number of incidental mortality or serious injury they cause to marine mammals. More information about the LOF and the classification process can be found at:

http://www.nmfs.noaa.gov/pr/interactions/fisheries/2016_list_of_fisheries_lof.html.

Five of the marine mammal species (sperm, sei, fin, blue, humpback, and North Atlantic right whales (NARW)) protected by the MMPA, are also listed as endangered under the Endangered Species Act (ESA). In addition to those five marine mammals, five species of sea turtles (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish; five DPSs of Atlantic sturgeon; and six species of coral [elkhorn coral (*Acropora palmata*), staghorn coral (*A. cervicornis*) ("*Acropora*" collectively); lobed star coral (*Orbicella annularis*), mountainous star coral (*O. faveolata*), and knobby star coral (*O. franksi*) ("*Orbicella*" collectively); and rough cactus coral (*Mycetophyllia ferox*)] are also protected under the ESA. Portions of designated critical habitat for NARW, the Northwest Atlantic (NWA) DPS of loggerhead sea turtles, and *Acropora* corals occur within the South Atlantic Council's jurisdiction. NMFS has conducted specific analyses ("Section 7 consultations") to evaluate the potential adverse effects from the South Atlantic snapper grouper fishery on species and critical habitat protected under the ESA. Information on these, as well as sea turtles and smalltooth sawfish and how they are adversely affected by the snapper grouper fishery are discussed below.

Subsequent to the June 7, 2006 biological opinion (2006 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. On September 10, 2014, NMFS listed 20 new coral species under the ESA, five of those species occur in the Caribbean (including Florida) and all of these are listed as threatened. The two previously listed *Acropora* coral species remain protected as threatened. In an "ESA section 7 consultation on the continued authorization of the snapper grouper and dolphin and wahoo fisheries following the listing of new coral species", dated September 11, 2014, NMFS indicated that the previous determination remains valid and the South Atlantic snapper grouper fishery is still not likely to adversely affect *Acropora* corals.

The September 10, 2014, final listing rule provided some new information on the threats facing *Acropora*; however, none of the information suggested that previous determinations were no longer valid. For this reason, a memo dated September 11, 2014, indicates that previous determination remains valid and the South Atlantic snapper grouper fishery is still not likely to adversely affect *Acropora* corals. For the remaining 5 species of coral (*Mycetophyllia ferox*, *Dendrogyra cylindrus*, *Orbicella annularis*, *O. faveolata*, and *O. franksi*), the threats to corals from fishing identified in the status review for these species (SSR) include (1) trophic effects, (2) human-induced physical damage, and (3) destructive fishing practices. The September 11, 2014, memo indicates South Atlantic snapper grouper fishery will not cause trophic effects because it does not capture herbivorous fish.

On December 1, 2016, NMFS completed a new biological opinion on the snapper grouper fishery of the South Atlantic Region (2016 Opinion). In this biological opinion, NMFS concluded that the snapper grouper fishery's continued authorization is not likely to jeopardize the continued existence of the NARW, loggerhead sea turtle Northwest Atlantic DPSs, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle North Atlantic DPS, green sea turtle South Atlantic DPS, hawksbill sea turtle, smalltooth sawfish U.S. DPS, or Nassau grouper. NMFS concluded that the proposed action is not likely to adversely affect designated critical habitat or other ESA-listed species in the South Atlantic Region.

3.2.5.1 ESA-Listed Sea Turtles

Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles are all highly migratory and travel widely throughout the South Atlantic. The following sections are a brief overview of the general life history characteristics of the sea turtles found in the South Atlantic region. Several volumes exist that cover the biology and ecology of these species more thoroughly (i.e., Lutz and Musick (eds.) 1997, Lutz et al. (eds.) 2002).

Green sea turtle hatchlings are thought to occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr 1987, Walker 1994). Pelagic stage green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick 1976, Hughes 1974). At approximately 20 to 25 cm carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal 1997). As juveniles move into benthic foraging areas a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also known to consume jellyfish, salps, and sponges (Bjorndal 1980, 1997; Paredes 1969; Mortimer 1981, 1982). The diving abilities of all sea turtles species vary by their life stages. The maximum diving range of green sea turtles is estimated at 110 m (360 ft) (Frick 1976), but they are most frequently making dives of less than 20 m (65 ft.) (Walker 1994). The time of these dives also varies by life stage. The maximum dive length is estimated at 66 minutes with most dives lasting from 9 to 23 minutes (Walker 1994).

The **hawksbill's** pelagic stage lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 cm in straight carapace length (Meylan 1988, Meylan and Donnelly 1999). The pelagic stage is followed by residency in developmental habitats (foraging areas where juveniles reside and grow) in coastal waters. Little is known about the diet of pelagic stage hawksbills. Adult foraging typically occurs over coral reefs, although other hard-bottom communities and mangrove-fringed areas are occupied occasionally. Hawksbills show fidelity to their foraging areas over several years (Van Dam and Diéz 1998). The hawksbill's diet is highly specialized and consists primarily of sponges (Meylan 1988). Gravid females have been noted ingesting coralline substrate (Meylan 1984) and calcareous algae (Anderes Alvarez and Uchida 1994), which are believed to be possible sources of calcium to aid in eggshell production. The maximum diving depths of these animals are not known, but the maximum length of dives is estimated at 73.5 minutes. More routinely, dives last about 56 minutes (Hughes 1974).

Kemp's ridley hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr 1987, Ogren 1989). Once the juveniles reach approximately 20 cm carapace length

they move to relatively shallow (less than 50 m) benthic foraging habitat over unconsolidated substrates (Márquez-M. 1994). They have also been observed transiting long distances between foraging habitats (Ogren 1989). Kemp's ridleys feeding in these nearshore areas primarily prey on crabs, though they are also known to ingest mollusks, fish, marine vegetation, and shrimp (Shaver 1991). The fish and shrimp Kemp's ridleys ingest are not thought to be a primary prey item but instead may be scavenged opportunistically from bycatch discards or from discarded bait (Shaver 1991). Given their predilection for shallower water, Kemp's ridleys most routinely make dives of 50 m or less (Soma 1985, Byles 1988). Their maximum diving range is unknown. Depending on the life stage, Kemp's ridleys may be able to stay submerged anywhere from 167 minutes to 300 minutes, though dives of 12.7 minutes to 16.7 minutes are much more common (Soma 1985, Mendonca and Pritchard 1986, Byles 1988). Kemp's ridleys may also spend as much as 96% of their time underwater (Soma 1985, Byles 1988).

Leatherbacks are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. Although they will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, leatherbacks' diets do not shift during their life cycles. Because leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive in excess of 1,000 m (Eckert et al. 1989) but more frequently dive to depths of 50 m to 84 m (Eckert et al. 1986). Dive times range from a maximum of 37 minutes to more routine dives of 4 to 14.5 minutes (Standora et al. 1984, Eckert et al. 1986, Eckert et al. 1989, Keinath and Musick 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora et al. 1984).

Loggerhead hatchlings forage in the open ocean and are often associated with *Sargassum* rafts (Hughes 1974, Carr 1987, Walker 1994, Bolten and Balazs 1995). The pelagic stage of these sea turtles eat a wide range of organisms including salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma 1972). Stranding records indicate that when pelagic immature loggerheads reach 40-60 cm straight-line carapace length they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic (Witzell 2002). Here they forage over hard- and soft-bottom habitats (Carr 1986). Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke et al. 1993). Estimates of the maximum diving depths of loggerheads range from 211 m to 233 m (692-764ft.) (Thayer et al. 1984, Limpus and Nichols 1988). The lengths of loggerhead dives are frequently between 17 and 30 minutes (Thayer et al. 1984, Limpus and Nichols 1988, Limpus and Nichols 1994, Lanyan et al. 1989) and they may spend anywhere from 80 to 94% of their time submerged (Limpus and Nichols 1994, Lanyan et al. 1989).

Sea turtles are vulnerable to capture by bottom longline and vertical hook-and-line gear. Hook-and-line gear used in the fishery includes commercial bottom longline gear and commercial and recreational vertical line gear (e.g., handline, bandit gear, and rod-and-reel). The magnitude of the interactions between sea turtles and the South Atlantic snapper grouper fishery was evaluated in NMFS (2006) and again in 2016 using data from the Supplementary Discard Data Program (SDDP). In 2006, 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 3.2.1**).

Table 3.2.1. Three-year South Atlantic anticipated takes sea turtles in the snapper grouper fishery.

Species	Amount of Take	Total
Green	Total Take	39
	Lethal Take	14
Hawksbill	Total Take	4
	Lethal Take	1
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 2016. Endangered Species Act Section 7 consultation on 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 (SGFMP) of the South Atlantic Region, including Proposed Regulatory Amendment 16 to the SGFMP. Biological Opinion. December 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 2016 Opinion also used the extrapolated data from the SDDP to estimate the magnitude of recreational fishing on sea turtles. NMFS estimated 23 loggerhead and 23 leatherback sea turtles would be captured on a triennial basis. Therefore, the 2006 consultation concluded the continued authorization of the fishery was not likely to jeopardize the continued existence of any of these species. However, the logbook data was reevaluated in 2016 (Farmer) and the new analysis indicated that the 2006 Opinion sea turtle capture estimates for bottom longlines were based on 2 SDDP reports that were not actually snapper grouper bottom longline sea turtle captures. Because Farmer (2016a) invalidated NMFS' 2006 bottom longline gear sea turtle capture estimates, and NMFS could not simply assume the same rates and number of captures in the absence of new data, NMFS looked at sea turtle capture data from other bottom longline fisheries in the Southeast Region. **Section 5.2.3.1** of the 2016 Opinion presents a summary of the primary observer data sources considered, and **Section 5.2.3.3** estimates mortality both on the line prior to retrieval and post-release mortality and present our overall mortality estimates for the bottom longline component of the South Atlantic snapper grouper fishery. **Table 3.2.1** reports the takes authorized for the fishery prior to completion of the 2016 consultation

Regulations implemented through Amendment 15B to the Snapper Grouper FMP (74 FR 31225; June 30, 2009; SAFMC 2008b) 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. Comprehensive Ecosystem-Based Amendment 2 modified these requirements (76 FR 82183; December 30, 2011; SAFMC 2011e) by requiring different gear for vessels with different freeboard heights, mirroring the requirements in the Gulf of Mexico. These regulations are thought to decrease the mortality associated with accidental interactions with sea turtles and smalltooth sawfish.

On September 22, 2011, NMFS and the U.S. Fish and Wildlife Service determined the loggerhead sea turtle population consists of nine DPSs (76 FR 58868). Previously, loggerhead sea turtles were listed as threatened species throughout their global range. The snapper grouper fishery interacts with loggerhead sea turtles from what is now considered the Northwest Atlantic (NWA) DPS, which remains listed as threatened. The February 15, 2012, memorandum stated that because the 2006 Opinion had evaluated the impacts of the fishery on the loggerhead subpopulations now wholly contained within the NWA DPS, the 2006 Opinion's conclusion that the fishery is not likely to jeopardize the continued existence of loggerhead sea turtles remains valid.

On July 10, 2014, NMFS published a final rule designating critical habitat for the Northwest Atlantic Ocean (NWA) Loggerhead Sea Turtle DPS in the *Federal Register* (79 FR 39856). The final rule, effective August 11, 2014, designated 38 marine areas within the Atlantic Ocean and Gulf of Mexico, which contain the physical or biological features essential for the conservation of the loggerhead sea turtle. A memorandum dated September 16, 2014, evaluated the effects of continued authorization of federal fisheries, including snapper grouper, on the newly-designated critical habitat. The memo concluded that activities associated with the snapper grouper fishery would not adversely affect any of the NWA loggerhead DPS critical habitat units.

On April 6, 2016, NMFS and the Fish and Wildlife Service (FWS) published a Final Rule in the *Federal Register* (81 FR 20057) removing the range-wide and breeding population ESA listings of the green sea turtle, and in their place, listing 8 green sea turtle DPSs as threatened and 3 green sea turtle DPSs as endangered, effective May 6, 2016. Two of the green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, occur in the South Atlantic Region and may be affected by snapper grouper fishing, based on the existing 2006 Opinion's analysis for green sea turtles as previously listed. Therefore, the Final Listing Rule created an additional issue for the ongoing consultation to address.

NMFS concluded on December 1, 2016, in the 2016 Opinion on the snapper grouper fishery of the South Atlantic Region, the fishery's continued authorization is not likely to jeopardize the continued existence of the NARW, loggerhead sea turtle Northwest Atlantic DPS, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle North Atlantic DPS, green sea turtle South Atlantic DPS, or hawksbill sea turtle.

3.2.5.2 ESA-Listed Marine Fish

Historically the **smalltooth sawfish** in the U.S. ranged from New York to the Mexico border. Their current range is poorly understood but believed to have contracted from these historical areas. In the South Atlantic region, they are most commonly found in Florida, primarily off the

Florida Keys (Simpfendorfer and Wiley 2004). Only two smalltooth sawfish have been recorded north of Florida since 1963 [the first was captured off North Carolina in 1963 and the other off Georgia in 2002 (National Smalltooth Sawfish Database, Florida Museum of Natural History)]. Historical accounts and recent encounter data suggest that immature individuals are most common in shallow coastal waters less than 25 meters (Bigelow and Schroeder 1953, Adams and Wilson 1995), while mature animals occur in waters in excess of 100 meters (Simpfendorfer pers. comm. 2006). Smalltooth sawfish feed primarily on fish. Mullet, jacks, and ladyfish are believed to be their primary food sources (Simpfendorfer 2001). Smalltooth sawfish also prey on crustaceans (mostly shrimp and crabs) by disturbing bottom sediment with their saw (Norman and Fraser 1938, Bigelow and Schroeder 1953).

Five DPSs of Atlantic sturgeon were listed since the completion of the 2006 Opinion (77 FR 5914, February 6, 2012, and 77 FR 5880, February 6, 2012). 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.

On June 29, 2016, NMFS published a final rule in the *Federal Register* listing **Nassau grouper** as threatened under the Endangered Species Act due to a decline in its population (81 FR 42268). The final rule became effective on July 29, 2016. The species is in need of more conservation efforts given its population has not yet recovered. However, this listing does not change current fishing regulations in the U.S. (including federal waters in U.S. Caribbean territories), as harvest of this species is already prohibited in state, territorial, and federal waters. Commercial and recreational fishing for this species was first prohibited in U.S. federal waters in 1990 when it was listed as a Species of Concern. Prior to 1990, historical harvest greatly diminished the population of Nassau grouper and eliminated many spawning groups. Because Nassau grouper is a slow growing, late maturing fish, the population has yet to recover despite conservation efforts. In addition, Nassau grouper is still harvested in several Caribbean countries and fishing pressure on the remaining spawning groups continues to threaten the species. While a threatened listing status does not afford the same strict prohibitions on import, export, and incidental catch that an endangered status does, NMFS will assess whether to add additional regulatory measures in future rule makings. NMFS will also organize a recovery team to begin development of a plan to guide the conservation and recovery of the species. The plan will lay out the criteria and actions necessary to ensure species recovery. It will also be used to ensure recovery efforts are on target and being met effectively and efficiently.

NMFS concluded on December 1, 2016 in the 2016 Opinion on the snapper grouper fishery of the South Atlantic Region that the fishery's continued authorization is not likely to jeopardize the continued existence of the smalltooth sawfish U.S. DPS or Nassau grouper. NMFS concluded that the proposed action is not likely to adversely affect designated critical habitat or other ESA-listed species in the South Atlantic Region.

3.3 Economic and Social Environment

3.3.1 Economic Environment

3.3.1.1 Economic Description of the Commercial Sector

In 2014, the U.S. seafood industry supported approximately 1.39 million full- and part-time jobs and generated \$153 billion in sales, \$42 billion in income, and \$64 billion in value added impacts nationwide (NMFS 2016). The nation's commercial fishing sector landed 9.4 billion pounds of finfish and shellfish with a dockside (ex-vessel) value of \$5.5 billion. Over 60% of those landings were made up of ten key species and species groups. None of those national key species or species groups are within the South Atlantic snapper grouper fishery.

Commercial fishermen in the South Atlantic Region (Region) landed approximately 105 million pounds of finfish and shellfish with a dockside value (revenue) of approximately \$184 million in 2014 (NMFS 2016), which is almost 1% of national landings by weight and approximately 3% by dockside revenue. Approximately 47% of the Region's landings by weight and 52% by dockside revenue were from the combined landings of blue crab and shrimp (**Table 3.3.1**).

Table 3.3.1. Key Commercial Species/Species Groups in the South Atlantic Region, 2014.

Key Species/ Species Group	Dockside revenue (thousands)	Pounds landed (thousands)	Average price per pound	Percent of all dockside revenue	Percent of all pounds landed
Blue crab	\$46,230	33,847	\$1.37	32.1%	32.1%
Clams	\$4,157	1,753	\$2.37	1.7%	1.7%
Flounders	\$13,470	4,726	\$2.85	4.5%	4.5%
Groupers	\$2,499	557	\$4.49	0.5%	0.5%
King mackerels	\$5,504	2,259	\$2.44	2.1%	2.1%
Oysters	\$7,146	1,140	\$6.27	1.1%	1.1%
Shrimp	\$50,00	15,809	\$3.17	15.0%	15.0%
Snappers	\$3, 883	1,149	\$3.38	1.1%	1.1%
Swordfish	\$5,656	1, 669	\$3.33	1.6%	1.6%
Tunas	\$6 ,233	2,659	\$2.34	2.5%	2.5%
Total Key	\$144,858	65,598		62.3%	62.3%
All Landings	\$184,346	105,343		100.0%	100.0%

Source: NMFS FEUS 2014.

Groupers and snappers are among the ten key species/species groups in the Region. Landings of snappers accounted for 2.3% of the Region's dockside revenue in 2013 and landings of groupers accounted for 1.6% of that revenue (**Table 3.3.1**). The average annual dockside price of groupers in 2013 was \$4.25 per pound and that of snappers was \$3.21 per pound. In 2012, the average dockside price of groupers was \$3.93 and for snappers was \$3.13 (NMFS 2015). Note that these snappers and groupers may include species that are not federally managed, such as tiger grouper.

Groupers and snappers are key species groups in all four of the South Atlantic States: East Florida (FL), Georgia (GA), North Carolina (NC) and South Carolina (SC). Black sea bass and tilefish, which are within the snapper grouper fishery, are also key species/species groups in the Carolinas (**Table 3.3.2**).

Table 3.3.2. Key species/species groups in South Atlantic States, 2014.

Key Species/ Species Group	Dockside revenue (thousands)				Percent all dockside revenue			
	East FL	GA	NC	SC	East FL	GA	NC	SC
Black sea bass			\$1,409	\$321			0.9%	
Groupers	\$596	Confidential	\$1,057	\$846	1.2%	Confidential	1.1%	4.3%
Snappers	\$2,084	Confidential	\$865	\$935	3.3%	Confidential	1.0%	4.7%
Tilefish				\$475				

Source: NMFS FEUS 2014.

The number of species within the snapper grouper fishery varied in recent years. Up until 2011, there were 73 species in the fishery. In 2012, implementation of the Comprehensive ACL Amendment (SAFMC 2011c) reduced the number of species to 60. In 2013, blue runner was removed (Amendment 27, SAFMC 2013), and four more species were removed in 2016 (Amendment 35, SAFMC 2015b): black snapper, dog snapper, mahogany snapper, and schoolmaster. Consequently, there are 55 species within the fishery, and five of those species are designated as ecosystem component species. The 50 species with federal regulations that manage their harvest comprise 21 individual species and seven species groups, or complexes, each with its own commercial ACL.

Any commercial fishing vessel that harvests any individual species or species group of the snapper grouper fishery in the South Atlantic EEZ must have a valid commercial snapper grouper permit that is specifically assigned to that vessel. The permit is a limited access permit for either an unlimited quantity of pounds (of species within the fishery) per trip or no more than 225 pounds per trip. The numbers of both valid unlimited and 225-lb permits have generally declined annually resulting in increased concentration of the commercial sector of the fishery (**Table 3.3.3**). If the expired but renewable permits as of March 9, 2016 become valid, there would be 555 vessels with valid unlimited and 116 vessels with valid trip-limited permits (225-lb). As of October 30, 2016, there were 114 vessels with a 225-lb permit (valid or renewable) and 521 vessels with an unlimited pounds permit (valid or renewable). Note that these permits do not allow fishing for wreckfish. To commercially land wreckfish, a vessel must have in addition to a valid snapper grouper permit a wreckfish permit. Wreckfish permits are limited to those vessels owned by individuals/businesses with shares in the wreckfish individual fishing quota (IFQ) program.

Table 3.3.3. Numbers of valid South Atlantic commercial snapper grouper permits, 2009-2016.

Year	Valid permits		Change		% Change	
	Unlimited	225-lb	Unlimited	225-lb	Unlimited	225-lb
2009	640	144	-25	-7	-3.76%	-4.64%
2010	624	139	-16	-5	-2.50%	-3.47%
2011	569	126	-55	-13	-8.81%	-9.35%
2012	558	123	-11	-3	-1.93%	-2.38%
2013	551	121	-7	-2	-1.25%	-1.63%
2014	541	109	-10	-12	-1.81%	-9.92%
2015	527	110	-14	+1	-2.59%	+0.91%
2016	537	108	+10	-2	+1.89%	-1.82%

Sources: SAFMC May 22, 2013 (Snapper Grouper Regulatory Amendment 19) for 2009 - 2013 and NMFS SERO PIMS as of March 13, 2014; October 13, 2015, and July 25, 2016.

The majority of commercial snapper grouper permit holders reside in Florida. North Carolina ranks second in number of residents who hold either permit (**Table 3.3.4**). Residents (individuals or businesses) of states outside the Region hold more unlimited and 225-pound permits than residents of Georgia.

Table 3.3.4. Number and percentage of valid and renewable/transferable snapper grouper permits by state of residence of permit holder as of March 9, 2016.

State	Unlimited permits		225-pound permits	
	Number	%	Number	%
FL	375	67.6%	103	88.8%
GA	6	1.1%	0	0.0%
NC	104	18.7%	8	6.9%
SC	52	9.4%	2	1.7%
Other	18	3.2%	3	2.6%
Total	555	100.0%	116	100.0%

Source: NMFS SERO PIMS.

Dealers that want to purchase, receive, trade or barter snapper grouper species or species complexes, excluding wreckfish, caught by federal commercially permitted fishing vessels must have a Gulf and South Atlantic dealer permit. As of March 23, 2016, there were 418 entities with that permit and approximately 57% (240) of those entities resided in Florida (**Table 3.3.5**). A dealer that purchases, receives, trades or barter wreckfish caught in federal waters must have a wreckfish permit. More recently, as of October 30, 2016, 415 entities had the dealer permit.

Table 3.3.5. Number and percentage of Gulf and South Atlantic dealer permits by state of residence of permit holder as of March 23, 2016.

State	Number	Percent
FL	240	57.4%
GA	4	1.0%
NC	56	13.4%
SC	25	6.0%
Subtotal	325	77.8%
All Other	93	22.2%
Total	418	100.0%

The actions proposed in this regulatory amendment concern fishing for mutton snapper only. Consequently, the remainder of this section focuses exclusively on commercial fishing for mutton snapper in the region.

Additional information on commercial landings and fishing for the snapper grouper fishery as a whole or the other species or complexes within it can be found in previous amendments, such as Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Regulatory Amendment 9 (SAFMC 2011a), and the Comprehensive ACL Amendment (SAFMC 2011c), and is incorporated herein by reference.

Mutton Snapper

The commercial fishing year (season) for mutton snapper, and most species and species groups within the snapper grouper fishery, runs from January 1 to December 31 every year. Since 2012, the commercial ACL for mutton snapper has been at 157,743 pounds whole weight (lbs ww). If commercial landings reach or are projected to reach or exceed the commercial ACL, the season is closed. However, no season has closed before the end of December. From 2012 through 2015, no more than 58.7% of the commercial ACL was landed (**Table 3.3.6**). Moreover, as of October 21, 2016, approximately 38% lbs ww of the mutton snapper ACL has been landed, and at that rate, 2016 commercial landings will also be less than the ACL and the season would remain open until December 31.

Table 3.3.6. Commercial landings (lbs ww) and ACL for mutton snapper harvested from South Atlantic Region, 2010-2014.

Year	Landings	Baseline ACL	Percent ACL
2010	74,737		
2011	66,158		
2012	77,122	157,743	48.9%
2013	74,229	157,743	47.1%
2014	91,173	157,743	57.8%
2015	92,569	157,743	58.7%
Average	79,331	157,743	50.3%

Source: NMFS SERO ACL.

Most of the commercial landings occur in Florida (**Figure 3.3.1**). From 2010 through 2014, Florida landings accounted for an average of 95% of the mutton snapper (lbs ww) landings. Florida regulations require the commercial vessel or its operator to have a Special Products license (SPL) with a Restricted Species (RS) endorsement in addition to a having a federal snapper grouper permit.

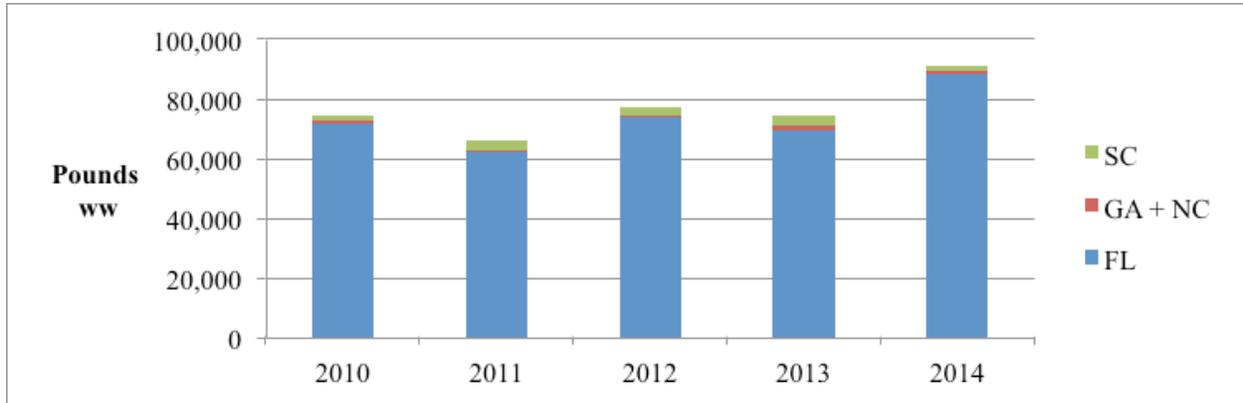


Figure 3.3.1. Annual commercial landings (lbs ww) of mutton snapper harvested from South Atlantic region by state, 2010-2014.
Source: NMFS SERO ACL.

Mutton snapper are typically solitary, non-schooling fish, but from April to August, they form large spawning aggregations around the full moon. These aggregations are highly predictable and they occur at the same locations throughout the spawning season and from year to year (Burgess et al. 2015). Two aggregation areas are Western Dry Rocks (state waters) and Eyeglass Bar (federal waters) off Key West, and the third is Riley’s Hump (federal waters) in the Dry Tortugas. Peak spawning occurs from May until early July, and commercial landings are typically highest in May and June; however, 2014 landings do not show the same trend (**Figures 3.3.2** and **3.3.3**). During the months of May and June, the possession of mutton snapper in or from federal or state waters on board a commercial fishing vessel is limited to 10 per person per day or 10 per person per trip, whichever is more restrictive.

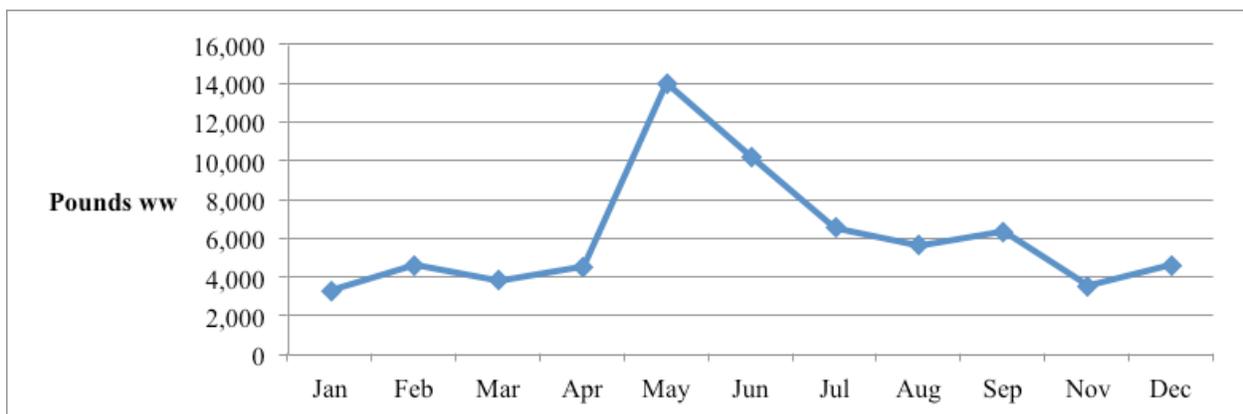


Figure 3.3.2. Average monthly commercial landings (lbs ww) of mutton snapper harvested from the South Atlantic region and landed in Florida, 2010-2014.
Source: NMFS SERO ACL.

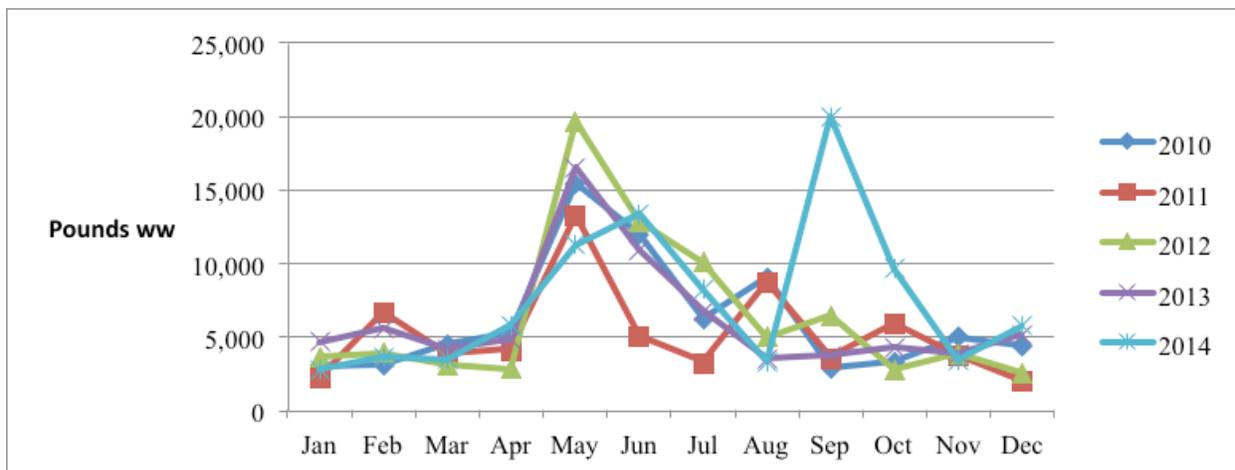


Figure 3.3.3. Monthly commercial landings (lbs ww) of mutton snapper harvested from South Atlantic region and landed in Florida, 2010-2014.
Source: NMFS SERO ACL.

The above-mentioned three spawning sites are located off Monroe County, which leads all counties in commercial landings of mutton snapper. From 2011 through 2015, commercial landings in Monroe County represented, on average, 64% of the area’s combined landings of the species. Duval County, which is north along the east coast of the state and includes Atlantic Beach and Jacksonville, ranks second in average annual landings (**Table 3.3.7**).

Table 3.3.7. Commercial landings of mutton snapper (lbs ww) by County in South Atlantic region, 2011-2015.

County	2011	2012	2013	2014	2015	Average	Percent
Brevard	77	87	92	166	1163	317	0.36%
Broward	1,468	1,689	2,366	1,054	850	1,485	1.71%
Duval	1,874	7,318	13,815	15,603	27,641	13,250	15.25%
Escambia	4	0	0	38	0	8	0.01%
Indian River	0	36	0	18	72	25	0.03%
Martin	3,503	2,041	259	620	601	1,405	1.62%
Miami-Dade	4,977	3,702	4,595	1,939	1,489	3,340	3.84%
Monroe	61,253	65,655	48,825	55,891	47,388	55,802	64.23%
Palm Beach	4,307	6,317	4,040	5,434	5,101	5,040	5.80%
St Johns	376	3018	4,609	5,055	4,260	3,464	3.99%
St Lucie	162	71	101	386	660	276	0.32%
Volusia	5162	4,684	1,334	775	384	2,468	2.84%
Total	83,163	94,618	80,036	86,979	89,609	86,881	100.00%

Source: Florida Fish & Wildlife Conservation Commission, Commercial Landings Summary, October 30 2016.

The majority of South Atlantic mutton snapper that are commercially landed in Florida are typically harvested from federal waters (**Table 3.3.8**). From 2010 through 2014, mutton snapper taken from federal waters accounted for an average of 65% of annual landings. In 2014, however, approximately 52% of Florida commercial landings were from waters of unreported

jurisdiction. Although a vessel may be in both federal and state waters during a single trip, the logbook guidance instructs vessel owners/operators to identify the area where the majority of the catch of each species originates.

Table 3.3.8. Florida commercial landings of mutton snapper (lbs ww) by jurisdiction in the South Atlantic region, 2010-2014.

Year	Federal	State	Unreported	Total	% Federal	% State	% Unreported
2010	46,296	10,321	18,120	74,737	61.95%	13.81%	24.25%
2011	47,023	3,960	15,175	66,158	71.08%	5.99%	22.94%
2012	57,704	6,169	13,249	77,122	74.82%	8.00%	17.18%
2013	57,080	3,965	13,184	74,229	76.90%	5.34%	17.76%
2014	34,868	8,580	47,725	91,173	38.24%	9.41%	52.35%
Average	48,594	6,599	21,491	76,684	64.60%	8.51%	26.89%

Source: NMFS SERO ACL

Hook and line is the most commonly used gear to harvest mutton snapper in the South Atlantic Region. Approximately 86% of commercial landings from 2010 through 2014 were taken with hook and line (**Figure 3.3.4**). Permitted vessels that use longline gear are prohibited from landing (or possessing) mutton snapper in the South Atlantic EEZ and Florida east coast waters.

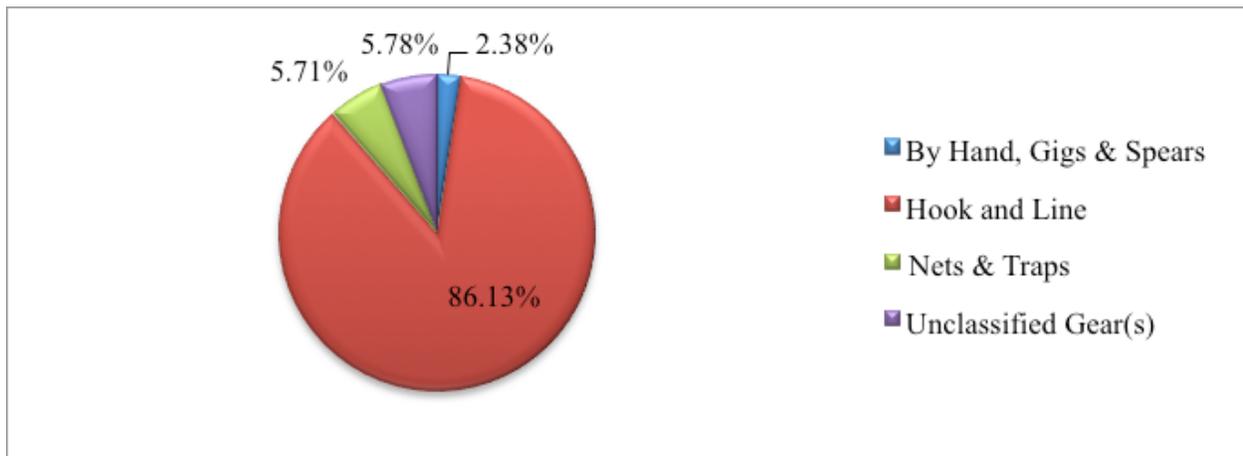


Figure 3.3.4. Percentage of mutton snapper landings (lbs ww) by gear, 2010-2014.

Source: NMFS SERO ACL.

As shown in **Figure 3.3.5**, annual commercial landings of mutton snapper in the South Atlantic Region have ranged between 43,397 and 65,698 lbs gutted weight (gw) since 2006. The annual average increased from 47,430 lbs gw during the 5-year period from 2006 through 2010 to 59,495 lbs gw during the second 5-year period from 2011 through 2015.

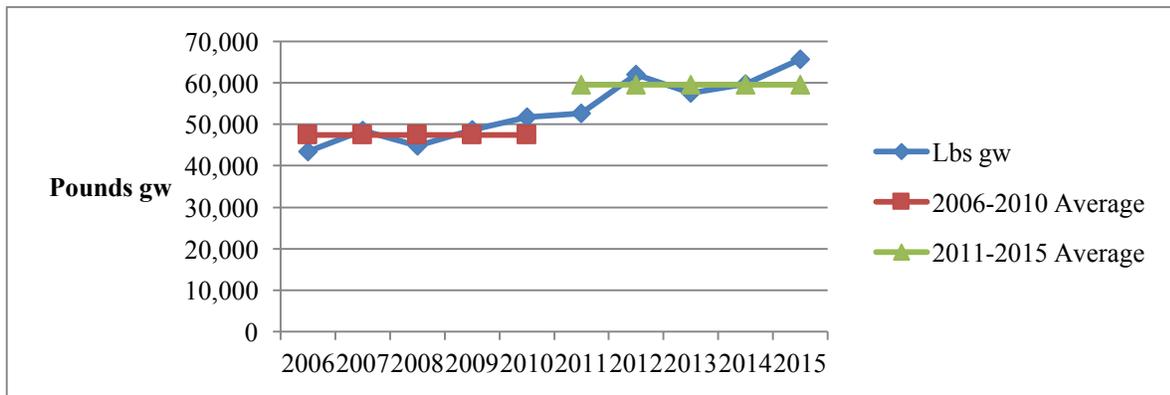


Figure 3.3.5. Annual commercial landings (lbs gw) of mutton snapper, 2006-2015.
Source: SEFSC Economic Query System, October 30, 2016.

From 2010 through 2014, an annual average of 272 vessels made 1,503 trips that landed 56,705 lbs gw of mutton snapper from the South Atlantic Region (**Table 3.3.9**). The average vessel harvested 38 lbs gw of the species when it was landed.

Table 3.3.9. Numbers and averages of vessels and trips with mutton snapper landings, 2010-2014.

Year	Number of Vessels	South Atlantic mutton snapper landings			
		Lbs gw	Ave lbs gw per vessel	Trips	Average lbs gw per trip
2010	313	51,749	165	1,495	35
2011	278	52,679	189	1,468	36
2012	258	61,943	240	1,410	44
2013	254	57,471	226	1,415	41
2014	257	59,683	232	1,729	35
Average	272	56,705	210	1,503	38

Source: NMFS SEFSC Economic Query System, October 24, 2016.

Annual landings of South Atlantic mutton snapper yielded an average of \$173,289 (2015 \$) in dockside revenue. The average annual dockside revenue from mutton snapper landings was \$645 per vessel and that revenue represented approximately 6.1% of dockside revenue from all trips that landed mutton snapper (**Table 3.3.10**).

Table 3.3.10. Dockside revenue (2015 \$) from mutton snapper and other species by trips with mutton snapper landings, 2011-2014.

Year	Dockside revenue (2015 \$) from mutton snapper trips					
	Mutton snapper	Average from mutton snapper per vessel	Other species	Total from jointly caught species	Average per vessel	Percent mutton snapper
2010	\$148,468	\$474	\$2,245,707	\$2,394,175	\$7,649	6.2%
2011	\$164,452	\$592	\$2,508,213	\$2,672,666	\$9,614	6.2%
2012	\$184,550	\$715	\$2,487,243	\$2,671,794	\$10,356	6.9%
2013	\$180,587	\$711	\$3,021,176	\$3,201,763	\$12,605	5.6%
2014	\$188,388	\$733	\$3,095,953	\$3,284,341	\$12,780	5.7%
Average	\$173,289	\$645	\$2,671,659	\$2,844,948	\$10,601	6.1%

Source: NMFS SEFSC Economic Query System, October 24, 2016.

Vessels with mutton snapper landings from 2010 through 2014 combined to generate average total dockside revenue of approximately \$10.7 million (**Table 3.3.11**). The average vessel had annual dockside revenue of \$50,738.

Table 3.3.11. Total dockside revenue (2015 \$) from mutton snapper and other species landed by vessels with mutton snapper landings in South Atlantic, 2010-2014.

Year	Dockside revenue (2015 \$) for all vessels with mutton snapper landings					
	From mutton snapper	From jointly caught species	From all other species	From all species	Average from all species per vessel	Percent mutton snapper
2010	\$148,468	\$2,601,777	\$10,922,222	\$13,523,999	\$43,208	1.10%
2011	\$164,452	\$2,845,659	\$11,197,201	\$14,042,861	\$50,514	1.17%
2012	\$184,550	\$2,793,278	\$10,085,178	\$12,878,456	\$49,916	1.43%
2013	\$180,587	\$3,294,150	\$10,224,112	\$13,518,262	\$53,222	1.34%
2014	\$188,388	\$3,319,651	\$11,286,392	\$14,606,043	\$56,833	1.29%
Average	\$173,289	\$2,970,903	\$10,743,021	\$13,713,924	\$50,738	1.3%

The following estimates of the economic impacts of commercial landings of mutton snapper are derived from using the model developed for and applied in NMFS (2016). The annual average landings of 56,705 lbs gw with dockside value of \$173,289 (2015 \$) generates annually 23 jobs, approximately \$631,000 in income impacts, \$892,000 in value added impacts, and \$1.718 million in sales impacts (**Table 3.3.12**).

Table 3.3.12. Estimates of average annual economic impacts of average commercial mutton snapper landings, 2011-2015.

Years to determine average	Dockside revenue	Number of jobs	Income impacts	Value added impacts	Sales impacts
2010-2014	\$173,289	23	\$631,000	\$892,000	\$1,718,000

Source: Estimates of economic impacts calculated by NMFS SERO using model developed for NMFS (2016).

From 2010 through 2014, approximately 98% of the 1,503 average annual trips that landed mutton snapper landed no more than 225 lbs gw (**Table 3.3.13**). Approximately 91% of trips landed no more than 100 lbs gw of the species.

Table 3.3.13. Number and percentage of trips by pounds landed of mutton snapper, 2010-2014.

Year	Number of trips by lbs gw of mutton snapper				Percent of total trips by lbs gw		
	1 to 100	101 to 225	Over 225	Total	1 to 100	101 to 225	1 to 225
2010	1,384	88	23	1,495	92.6%	5.9%	98.5%
2011	1,356	92	20	1,468	92.4%	6.3%	98.6%
2012	1,250	113	47	1,410	88.7%	8.0%	96.7%
2013	1,256	130	29	1,415	88.8%	9.2%	98.0%
2014	1,583	124	22	1,729	91.6%	7.2%	98.7%
Average	1,366	109	28	1,503	90.8%	7.3%	98.1%

Source: SEFSC Online Economic Query System, October 16, 2016.

From 2010 through 2014, vessels that landed mutton snapper had an average crew of approximately two persons (including captain), and the average trip took approximately two days. An average of 38 lbs gw of mutton snapper were landed per trip and 18 lbs gw per person (**Table 3.3.14**).

Table 3.3.14. Average number of crew and pounds (gw) per person per trip, 2010-2014.

Year	Lbs gw	Trips	Average number per trip			
			Crew	Lbs gw	Lbs gw/person	Days
2010	51,749	1,495	2.0	34.6	17.3	2.0
2011	52,679	1,468	2.0	35.9	17.9	2.0
2012	61,943	1,410	2.1	43.9	20.9	1.9
2013	57,471	1,415	2.2	40.6	18.5	2.2
2014	59,683	1,729	2.1	34.5	16.4	1.8
Average	56,705	1,503	2.1	37.9	18.2	2.0

Source: SEFSC Economic Query System, October 21, 2016.

The average weight of a commercially landed mutton snapper was estimated to be 7.68 lbs ww (6.92 lbs gw) in the most recent stock assessment (SEDAR 15A update 2015). That indicates the average vessel landed approximately 6 mutton snapper and approximately 3 mutton snapper per person per trip.

3.3.1.2 Economic Description of the Recreational Sector

In 2014, there were approximately 11 million recreational saltwater anglers across the U.S. who took 68 million saltwater fishing trips around the country. These anglers spent \$4.9 billion on fishing trips and \$28 billion on durable fishing-related equipment, supporting approximately 370,000 full- and part-time jobs and generating \$52.4 billion in sales, \$17.9 billion in income, and \$29 billion in value added impacts nationwide (NMFS 2015). The top two of the ten key species and species groups are Atlantic croaker and spot (approximately 33.8 million caught) and seatrouts (approximately 24.5 million caught). None of the national key species or species groups are within the South Atlantic snapper grouper fishery. The ten key species and species groups in the South Atlantic Region include one species from the snapper grouper fishery: black sea bass (NMFS 2015).

Approximately 2.7 million saltwater anglers made approximately 17.6 million saltwater trips in the South Atlantic in 2014 (**Table 3.3.15**). Approximately 47% of the trips were by anglers from shore, 2% by anglers on for-hire fishing vessels, and 51% by those on private/rental vessels. Over half of these trips (approximately 9 million) were out of East Florida.

The approximately 9.6 million trips out of East Florida were made by approximately 1.8 million anglers and generated 36,557 jobs, approximately \$4.0 million in sales, \$1.6 million in income, and \$2.5 million in value added (**Table 3.3.16**). The number of anglers, trips and the economic impacts of those trips for the other states in the region are included in **Table 3.3.16**.

Table 3.3.15. Angler trips in the South Atlantic region by area, 2014.

State	Shore	For-hire vessel	Private/rental vessel	Total	Percent by shore	Percent by for-hire	Percent by private
East FL	4,500,293	192,504	4,950,765	9,643,562	46.7%	2.0%	51.3%
GA	455,962	30,773	339,842	826,577	55.2%	3.7%	41.1%
NC	3,150,123	96,620	1,707,330	4,954,073	63.6%	2.0%	34.5%
SC	1,288,538	94,374	838,376	2,221,288	58.0%	4.2%	37.7%
Total	9,394,916	414,271	7,836,313	17,645,500	53.2%	2.4%	44.4%

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division July 27, 2016.

Table 3.3.16. Anglers, angler trips, and economic impacts of trips in the South Atlantic.

State	Anglers	Trips	Thousands			
			Jobs	Sales	Income	Value added
East FL	2,141,096	9,643,562	44,789	\$4,782,488	\$2,022,279	\$3,122,289
GA	309,884	826,577	2,145	\$189,737	\$88,010	\$135,562
NC	1,655,544	4,954,073	16,007	\$1,529,378	\$636,034	\$989,793
SC	863,940	2,221,288	6,224	\$545,375	\$219,815	\$344,307
Total	4,970,464	17,645,500				

Sources: For anglers and trips, Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division July 27, 2016 and for impacts, FEUS 2014.

Anglers in the South Atlantic region caught approximately 100 million fish in 2014 (Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division July 27, 2016). Approximately 35 million of these fish were harvested and 65 million released (**Table 3.3.17**). Drums, herrings, mullets, jacks, and porgies are among the top five species groups by numbers of fish harvested in 2014. Porgies and jacks are among the species groups in the snapper grouper fishery.

Table 3.3.17. Species groups caught by anglers in the South Atlantic Region, 2013.

NOTE: Species groups denoted in italics contain species that belong to the snapper grouper fishery management unit.

Species Group	Number of Fish			Rank Harvested	Rank Released	In snapper-grouper fishery
	Harvested	Released	Total			
Barracudas	111,796	118,032	229,828	15	19	No
Bluefish	1,802,306	3,412,354	5,214,660	6	6	No
Cartilaginous Fish	101,144	4,038,608	4,39,752	16	5	No
Catfishes	98,662	2,520,979	2,619,641	17	9	No
Cods and Hakes	43	12,844	12,887	23	24	No
Dolphins	574,701	243,676	818,377	12	17	No
Drums	12,212,773	19,270,522	31,483,295	1	1	No
Eels	3,097	25,690	28,787	22	23	No
Flounders	584,816	1,654,715	2,239,531	11	13	No
<i>Grunts</i>	<i>1,029,766</i>	<i>1,990,468</i>	<i>3,020,234</i>	<i>10</i>	<i>11</i>	<i>Yes</i>
Herrings	5,136,521	2,280,837	7,417,358	2	10	No
<i>Jacks</i>	<i>2,341,180</i>	<i>4,522,740</i>	<i>6,863,920</i>	<i>4</i>	<i>4</i>	<i>Yes</i>
Mullets	4,390,734	1,924,485	6,315,219	3	12	No
<i>Porgies</i>	<i>1,866,688</i>	<i>8,324,149</i>	<i>10,190,837</i>	<i>5</i>	<i>2</i>	<i>Yes</i>
Puffers	92,411	711,833	804,244	18	15	No
<i>Sea Basses</i>	<i>397,412</i>	<i>5,240,033</i>	<i>5,637,445</i>	<i>13</i>	<i>3</i>	<i>Yes</i>
Searobins	0	95,747	95,747	24	21	No
<i>Snappers</i>	<i>1,483,017</i>	<i>3,403,685</i>	<i>4,886,702</i>	<i>8</i>	<i>7</i>	<i>Yes</i>
Temperate Basses	11,073	107,805	118,878	21	20	No
Toadfishes	11,434	486,591	498,025	20	16	No

Table 3.3.17. Continued.

Species Group	Number of Fish			Rank Harvested	Rank Released	In snapper-grouper fishery
	Harvested	Released	Total			
<i>Triggerfishes/Filefishes</i>	184,065	152,341	336,406	14	18	Yes
Tunas and Mackerel	1,284,981	961,422	2,246,403	9	14	No
<i>Wrasses</i>	69,249	26,028	95,277	19	22	Yes
Other Fishes	1,566,061	3,244,014	4,810,075	7	8	No
Total	35,353,930	64,769,598	100,123,528			

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, July 26, 2016.

Private or rented recreational fishing vessels are not required to have a federal permit to harvest snapper grouper species from the EEZ. Anglers aboard these vessels, however, must either be federally registered or licensed in states that have a system to provide complete information on the states' saltwater anglers to the national registry.

Any for-hire fishing vessel that takes anglers into the South Atlantic EEZ where anglers harvest snapper grouper species must have a charter/headboat permit that is specifically assigned to that vessel. As of March 24, 2016, there were 1,440 vessels with the permit. Approximately 60% (869) of these permitted for-hire fishing vessels had mailing recipients in Florida (**Table 3.3.18**).

Table 3.3.18. Number and percentages of vessels with South Atlantic charter/headboat snapper grouper permit by state of mailing recipient as of March 24, 2014.

State	Number of permitted vessels	Percent of permitted vessels
FL	869	60.3%
GA	36	2.5%
NC	249	17.3%
SC	139	9.7%
Other	147	10.2%
Total	1,440	100.0%

Source: PIMS.

The actions proposed in this amendment concern fishing for mutton snapper only. Consequently, the remainder of this section focuses exclusively on recreational fishing for mutton snapper in the South Atlantic Region.

Additional information on recreational landings and fishing for the snapper grouper fishery as a whole or the other species or complexes within it can be found in previous amendments, such as Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Regulatory Amendment 9 (SAFMC 2011a), and Comprehensive ACL Amendment (SAFMC 2011c), and is incorporated herein by reference.

Mutton Snapper

The recreational fishing year (season) for mutton snapper and most species or species groups within the snapper grouper fishery runs from January 1 to December 31 every year. If recreational landings reach or are projected to reach or exceed the recreational ACL, the season is closed (unless NMFS determines that a closure is unnecessary). Prior to 2012, there was no ACL and since 2012, the recreational ACL for mutton snapper has been at 768,857 lbs ww. No season to date has closed early. From 2012 through 2014, no more than 85.9% of the ACL was landed (**Table 3.3.19**). The annual average from 2010 through 2014 is approximately 63% of the recreational ACL. Preliminary data for 2015 indicate approximately 85% of the recreational ACL was landed by anglers from January through October.

Table 3.3.19. Recreational landings (lbs ww) and ACL for mutton snapper, 2010-2014.

Year	Landings	Baseline ACL	Percent ACL
2010	477,647		
2011	251,446		
2012	505,583	768,857	65.8%
2013	660,449	768,857	85.9%
2014	538,122	768,857	70.0%
Average	486,649	768,857	63.3%

Source: NMFS SERO ACL.

Like the commercial sector, the largest percentage of recreational landings in the region tends to be in May and June, which is when spawning tends to peak (**Figure 3.3.6**). From 2012 through 2015, May and June landings (lbs ww) of mutton snapper represented, on average, approximately 31% of the year's recreational landings.

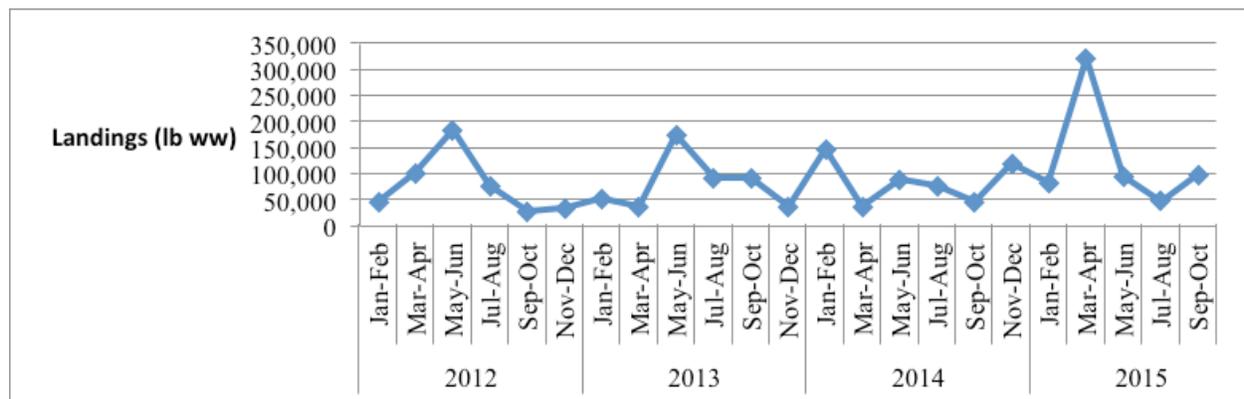


Figure 3.3.6. Recreational landings (lbs gw) of mutton snapper in South Atlantic Region by wave, 2012-2015.

Source: NMFS SERO Historical South Atlantic Recreational Landings

(http://sero.nmfs.noaa.gov/sustainable_fisheries/acl_monitoring/recreational_sa/historical/index.html)

From 2010 through 2014, almost all of the mutton snapper caught by anglers in the South Atlantic Region were caught in East Florida, and all of those harvested were by anglers out of East Florida; none were caught by anglers on trips out of the Carolinas (**Table 3.3.20**). All of the 52 mutton snapper caught and released by anglers out of Georgia were by anglers fishing in state

waters aboard for-hire fishing vessels. Because most to all of mutton snapper are caught by anglers during Florida trips, the following description of recreational catch and harvest will focus on the East Florida catch. Here harvested numbers of mutton snapper refers to the combination of those landed whole (and available for identification and enumeration by the interviewers) and those caught and filleted, released dead, given away, or disposed of in some way other than being landed or released alive.

Table 3.3.20. Estimates of recreational catch of mutton snapper (numbers of fish) in the South Atlantic region by state, 2010-2014.

Year	State	Harvested	Released alive	Total caught	Percent harvested
2010	East FL	97,886	51,193	149,079	65.7%
2011	East FL	38,557	15,817	54,374	70.9%
2012	East FL	43,133	94,228	137,361	31.4%
	GA	0	52	52	0.0%
2013	East FL	64,317	120,825	185,142	34.7%
2014	East FL	90,882	189,399	280,281	32.4%

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division March 28, 2016.

The most popular mode to catch mutton snapper is private/rental vessels. From 2010 through 2014, anglers on private/rental vessels caught an estimated 76% of mutton snapper caught annually in East Florida. Anglers on shore accounted for approximately 15% of the catch (**Table 3.3.21**). The majority (86%) of mutton snapper caught by anglers on shore were released alive (**Table 3.3.22**). A mutton snapper caught by an angler onboard a for-hire vessel is more likely to be harvested than a fish caught by an angler fishing onboard a private/rental vessel or from shore.

Table 3.3.21. Estimates of recreational catch (numbers of fish) of mutton snapper in East Florida by mode, 2010-2014.

Year	Mode	Number of fish			Percent caught
		Harvested	Released	Total caught	
2010	Shore	8,754	6,607	15,361	10.3%
	For-Hire	12,584	6,394	18,978	12.7%
	Private/Rental	76,549	38,191	114,740	77.0%
	All	97,887	51,192	149,079	100.0%
2011	Shore	3,728	964	4,692	8.6%
	For-Hire	10,639	1,558	12,197	22.4%
	Private/Rental	24,189	13,295	37,484	68.9%
	All	38,556	15,817	54,373	100.0%
2012	Shore	763	63,383	64,146	46.7%
	For-Hire	7,616	1,217	8,833	6.4%
	Private/Rental	34,753	29,628	64,381	46.9%
	All	43,132	94,228	137,360	100.0%
2013	Shore	3,564	20,002	23,566	12.7%
	For-Hire	8,081	7,547	15,628	8.4%
	Private/Rental	52,672	93,276	145,948	78.8%
	All	64,317	120,825	185,142	100.0%
2014	Shore	781	14,281	15,062	5.4%
	For-Hire	9,364	7,160	16,524	5.9%
	Private/Rental	80,736	167,958	248,694	88.7%
	All	90,881	189,399	280,280	100.0%
Average	Shore	3,518	21,047	24,565	15.2%
	For-Hire	9,657	4,775	14,432	9.0%
	Private/Rental	53,780	68,470	122,249	75.8%
	All	66,955	94,292	161,247	100.0%

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division March 28, 2016.

Table 3.3.22. Estimates of average annual catch (numbers of fish) of mutton snapper and percent harvested by anglers in East Florida by mode, 2010-2014.

Mode	Average annual number of fish			Harvested/caught*100
	Harvested	Released	Total caught	
Shore	3,518	21,047	24,565	14.3%
For-Hire	9,657	4,775	14,432	66.9%
Private/Rental	53,780	68,470	122,249	44.0%

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division March 28, 2016.

The minimum size limit for mutton snapper in federal and Florida waters is 16 inches total length (TL). Because juvenile mutton snapper live in inshore areas, and adults are found in or near offshore reef and rock rubble habitats, it is expected that the largest percentage of released mutton snapper is attributed to anglers on shore.

Most mutton snapper that are caught and harvested by East Florida anglers are fished from state waters (**Tables 3.3.23**). Approximately 14% of the mutton snapper that are caught are from federal waters, and approximately 22% of those harvested are from federal waters. Mutton snapper caught in federal waters off East Florida are more likely to be harvested. It is estimated that approximately 70% of those caught in the EEZ are harvested compared to approximately 44% of those caught in state waters (**Table 3.3.23**). Preliminary data for 2015 suggest approximately 13% of the mutton snapper caught were fished for in federal waters and approximately 24% of the mutton snapper harvested were from federal waters.

Table 3.3.23. Estimates of number of mutton snapper caught and harvested by East Florida anglers by waters fished, 2010-2014.

Year	Number of fish					
	East FL (state) waters			Federal waters off East FL		
	Caught	Harvested	Percent harvested	Caught	Harvested	Percent harvested
2010	117,041	77,527	66.2%	32,038	20,360	63.5%
2011	46,109	32,550	70.6%	8,264	6,006	72.7%
2012	123,596	31,204	25.2%	13,764	11,929	86.7%
2013	164,880	48,687	29.5%	20,262	15,630	77.1%
2014	240,780	71,038	29.5%	39,501	19,844	50.2%
Average	138,481	52,201	44.2%	22,766	14,754	70.1%

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division March 28, 2016.

From 2010 through 2014, an average of 22,341 annual angler trips targeted mutton snapper (**Table 3.3.24**). All of these angler trips were in East Florida. Mutton snapper was the primary target of approximately 82% of those annual trips, and approximately 36% of the trips were in federal waters (**Table 3.3.25**). Private/rented vessels accounted for an annual average of approximately 89% of the targeted trips (both FL and federal waters) and approximately 97% of the targeted trips in federal waters. For-hire vessels accounted for an annual average of approximately 2% of all trips that targeted mutton snapper (in all waters) and approximately 3%

of the trips that targeted the species in federal waters. During these trips, mutton snapper are not necessarily caught. More trips that do not target the species catch the species.

Table 3.3.24. Estimates of number and percentage of angler trips that targeted mutton snapper in the South Atlantic region (off East Florida), 2010-2014.

Year	Number of targeted trips			Percentage	
	Primary	Secondary	Total	Primary	Secondary
2010	18,487	2,835	21,322	86.7%	13.3%
2011	22,508	3,568	26,076	86.3%	13.7%
2012	14,210	1,839	16,049	88.5%	11.5%
2013	20,096	7,970	28,066	71.6%	28.4%
2014	15,305	4,887	20,192	75.8%	24.2%
Average	18,121	4,220	22,341	81.8%	18.2%

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division March 31, 2016.

Table 3.3.25. Estimates of number and percentage of angler trips that targeted mutton snapper in the South Atlantic region by mode and waters fished, 2010-2014.

Year	Number of angler trips that targeted mutton snapper							
	East FL waters			EEZ off FL			Total	Percent EEZ
	Shore	For-Hire	Private/Rental	Shore	For-Hire	Private/Rental		
2010	1,553	0	12,405	0	786	6,578	21,322	34.5%
2011	0	0	22,381	0	0	3,694	26,075	14.2%
2012	1,993	453	7,552	0	60	5,991	16,049	37.7%
2013	6,055	39	11,596	0	0	10,376	28,066	37.0%
2014	913	271	7,741	0	255	11,014	20,194	55.8%
Average	2,103	153	12,335	0	220	7,531	22,341	35.8%

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division April 1, 2016.

The average annual 19,866 target trips for mutton snapper by private/rental vessels (12,335 plus 7,531) are estimated to generate 10 jobs and approximately \$410,000 in sales impacts in Florida (**Table 3.3.26**). The combined average of 22,341 trips in East Florida generated approximately 13 jobs, \$552,000 in sales impacts, \$891,000 in value-added impacts and \$1.44 million in sales impacts.

Table 3.3.26. Economic impacts of angler trips that targeted mutton snapper (2015 \$).

Mode	Average Annual Target Trips	Jobs	Impacts in thousands		
			Income	Value-Added	Sales
Private/Rented	19,866	10	\$410	\$677	\$1,092
For-Hire	373	2	\$114	\$167	\$274
Shore	2,103	1	\$28	\$47	\$75
Total	22,341	13	\$552	\$891	\$1,441

Source: Estimates of economic impacts calculated by NMFS SERO using model developed for NMFS (2016). Note: Averages are rounded to whole numbers and may not sum to total due to rounding error.

From 2010 through 2014, anglers made an annual average of 116,284 trips in East Florida that caught mutton snapper (harvested or released) (**Table 3.3.27**). Approximately 16% of these trips occurred in federal waters. The average annual 22,341 trips that targeted the species represent approximately 19% of the 116,284 average annual trips that caught mutton snapper. Approximately 74% of the trips that caught the species were by anglers on private/rental vessels.

Table 3.3.27. Estimates of number of East Florida angler trips that caught mutton snapper by mode and waters fished, 2010-2014.

Year	Number of angler trips that caught mutton snapper							Total	Percent EEZ
	East FL waters			EEZ					
	Shore	For-Hire	Private/Rental	Shore	For-Hire	Private/Rental			
2010	13,589	12,244	94,820	0	7,901	14,384	142,938	15.6%	
2011	4,502	9,857	33,005	0	1,983	4,585	53,932	12.2%	
2012	30,395	4,540	52,289	0	2,494	12,661	102,379	14.8%	
2013	8,372	16,698	88,084	0	2,372	19,823	135,349	16.4%	
2014	10,720	11,643	95,386	0	6,640	22,434	146,823	19.8%	
Average	13,516	10,996	72,717	0	4,278	14,777	116,284	15.8%	

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division April 4, 2016.

From 2010 through 2014, an annual average of 77,413 angler trips harvested mutton snapper (**Table 3.3.28**). Those 77,413 trips represent approximately 67% of the estimated average annual 116,284 trips that caught mutton snapper. Approximately 20% of the trips that harvested mutton snapper were in federal waters. It is estimated that for-hire fishing vessels accounted for approximately 19% of angler trips that harvested mutton snapper in all waters and 29% of the 15,665 average annual trips that harvested mutton snapper from the EEZ during that time.

Table 3.3.28. Estimates of number of East Florida angler trips that caught and harvested mutton snapper by mode and waters fished, 2010-2014.

Year	Number of angler trips that harvested mutton snapper							
	East FL waters			EEZ off FL			Total	Percent EEZ
	Shore	For-Hire	Private/Rental	Shore	For-Hire	Private/Rental		
2010	8,749	12,014	71,907	0	7,901	12,144	112,715	17.8%
2011	3,538	9,857	24,325	0	1,983	2,858	42,561	11.4%
2012	763	4,040	36,055	0	2,494	11,148	54,500	25.0%
2013	3,564	15,447	53,535	0	2,372	16,274	91,192	20.4%
2014	688	10,388	53,872	0	6,564	14,587	86,099	24.6%
Average	3,460	10,349	47,939	0	4,263	11,402	77,413	19.8%

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division April 4, 2016.

From 2010 through 2014, an annual average of 48,156 angler trips caught and released mutton snapper (**Table 3.3.29**). Those estimated 48,156 trips represent approximately 41% of the average annual trips that caught mutton snapper. Approximately 11% of the trips occurred in federal waters. For-hire vessels accounted for an average of approximately 7% of the catch-and-release trips in all waters and approximately 11% of the catch-and-release trips in the EEZ during that time.

Table 3.3.29. Estimates of number of East Florida angler trips that caught and released mutton snapper by mode and waters fished, 2010-2014.

Year	Number of angler trips that caught and released mutton snapper							
	East FL waters			EEZ			Total	Percent EEZ
	Shore	For-Hire	Private/Rental	Shore	For-Hire	Private/Rental		
2010	4,841	3,216	24,774	0	1,548	4,535	38,914	15.6%
2011	964	896	9,653	0	132	1,728	13,373	13.9%
2012	30,395	774	20,105	0	138	1,697	53,109	3.5%
2013	4,809	3,076	40,901	0	361	3,549	52,696	7.4%
2014	10,032	3,736	57,040	0	815	11,064	82,687	14.4%
Average	10,208	2,340	30,495	0	599	4,515	48,156	11.0%

The recreational bag limit for mutton snapper is included within the aggregate bag limit for snappers which is no more than 10 fish per person per day. Hence, an angler can land up to 10 mutton snapper if no other species within the aggregate limit is landed. From 2010 through 2014, an annual average of 77,413 trips (**Table 3.3.28**) landed an annual average of 66,955 mutton snapper with a collective weight of 201,160 pounds. The average trip harvested one mutton snapper, and the average weight per fish was about three pounds (**Table 3.3.30**). All of the harvest occurred in East Florida.

Table 3.3.30. Estimates of observed pounds and number of mutton snapper harvested in the South Atlantic Region, 2010-2014.

Year	Harvest		
	Pounds	Number of fish	Pounds per fish
2010	314,059	97,887	3.21
2011	130,388	38,557	3.38
2012	159,900	43,133	3.71
2013	205,214	64,317	3.19
2014	241,237	90,882	2.65
Average	210,160	66,955	3.23

Source: Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division March 28, 2016.

3.3.2 Social Environment

This amendment affects commercial and recreational management of mutton snapper in the South Atlantic. This section provides the background for the proposed actions, which will be evaluated in **Chapter 4**. Commercial and recreational mutton snapper landings are included by state to provide information on the geographic distribution of fishing involvement. Descriptions of the top fishing communities, including the top communities involved in commercial mutton snapper fishing in the South Atlantic, are included along with the top Florida recreational fishing communities based on recreational engagement. Community level data are presented in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Act, which requires the consideration of the importance of fishery resources to human communities when changes to fishing regulations are considered. Lastly, social vulnerability data are presented to assess the potential for environmental justice concerns. Additional information on the South Atlantic recreational and commercial mutton snapper fishery is provided in the Economic Environment in **Section 3.3.1**.

Landings by State

As described in **Section 3.3.1**, nearly all South Atlantic commercial and recreational mutton snapper landings come from waters adjacent to Florida and the majority of South Atlantic mutton snapper is landed by the recreational sector (over 86% on average for years 2010-2014, SERO and SEFSC ACL Files). From 2010 to 2014, recreational landings have ranged from 251,446 lbs ww to 660,449 lbs ww (**Table 3.3.19**) and commercial landings have ranged from 66,160 lbs ww to 91,173 lbs ww (**Table 3.3.6**). Almost all recreational mutton snapper is caught in Florida waters (**Table 3.3.20**). The majority of commercial mutton snapper is landed in Florida (average of 95% of commercial landings, **Figure 3.3.1**) and a small proportion is landed in South Carolina (range of 0.9% to 2.2% of commercial mutton snapper landings for years 2010-2014, NMFS SERO ACL Files) and Georgia and North Carolina (range of 2.0% to 4.6%). Data for North Carolina are combined with Georgia to maintain confidentiality, but the majority of the landings reported for the combined category occurred in North Carolina.

Fishing Communities

The descriptions of South Atlantic communities include information about the top communities based on a “regional quotient” (RQ) of commercial landings and value for mutton snapper. The RQ is the proportion of landings and value out of the total landings and value of that species for that region, and is a relative measure. These communities would be most likely to experience the effects of the proposed actions that could change the mutton snapper fishery and impact participants, associated businesses, and communities within the region. If a community is identified as a mutton snapper community based on the RQ, this does not necessarily mean that the community would experience significant impacts due to changes in the mutton snapper fishery if a different species or number of species were also important to the local community and economy. Additional detailed information about communities with the highest RQs, can be found for South Atlantic communities on the Southeast Regional Office’s Community Snapshots website at http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/.

In addition to examining the RQs to understand how communities are engaged and reliant on fishing, indices were created using secondary data from permit and landings information for the commercial sector (Jepson and Colburn 2013, Jacob et al. 2013). Fishing engagement is primarily the absolute numbers of permits, landings, and value for all species. 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 all species. Fishing reliance includes the same variables as fishing 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. Factor scores of both engagement and reliance were plotted for the communities with the highest RQs. Two thresholds of one and one-half standard deviation above the mean are plotted to help determine a threshold for significance. The factor scores are standardized; therefore, a score above a value of 1 is also above one standard deviation. A score above one-half standard deviation is considered engaged or reliant with anything above one standard deviation to be very engaged or reliant.

The reliance index uses factor scores that are normalized. The factor score is similar to a z-score in that the mean is always zero, positive scores are above the mean, and negative scores are below the mean. Comparisons between scores are relative; however, like a z-score, the factor score puts the community on a point in the distribution. Objectively, that community will have a score related to the percent of communities with similar attributes. For example, a score of 2.0 means the community is two standard deviations above the mean and is among the 2.27% most vulnerable places in the study (normal distribution curve). Reliance score comparisons between communities are relative; however, if the community scores greater than two standard deviations above the mean, this indicates that the community is dependent on fishing. Examining the component variables on the reliance index and how they are weighted by factor score provides a measurement of commercial reliance. The reliance index provides a way to gauge change over time in these communities and also provides a comparison of one community with another.

Landings for the recreational sector are not available by species at the community level; therefore, it is not possible with available information to identify communities as dependent on recreational fishing for mutton snapper. However, nearly all of the recreational catch of mutton snapper is caught in Florida (**Table 3.3.20**). Because limited data are available concerning how recreational fishing communities are engaged and reliant on specific species, indices were created using secondary data from permit and infrastructure information for the southeast recreational fishing sector at the community level (Jepson and Colburn 2013, Jacob et al. 2013). Recreational fishing engagement is represented by the number of recreational permits and vessels designated as “recreational” by homeport and owners address. Fishing reliance includes the same variables as fishing engagement, divided by population. Factor scores of both engagement and reliance were plotted. Florida communities in the South Atlantic were included in the analysis because the majority of recreational mutton snapper fishing occurs off the coast of Florida. Communities were analyzed in ranked order by recreational fishing engagement. The top 15 recreational communities located in East Florida are presented.

Commercial Fishing Communities

As described in **Section 3.3.1.1**, three locations where mutton snapper are known to aggregate during spawning season are located off Monroe County, in the Florida Keys and from 2010 to 2014, the most commercial landings were landed in Monroe County (average of 65% of mutton snapper commercial landings, **Table 3.3.7**). The second ranked county is Duval County, which landed an average of 13.4% of commercial landings (**Table 3.3.7**). Other top counties include Palm Beach (7% of commercial landings), Miami-Dade (4%), Volusia (2.4%), and Martin (2.1%, **Table 3.3.7**).

All of the top mutton snapper communities are located in Florida (**Figure 3.3.7**). About 57% of mutton snapper is landed in the top four communities (Key West, Mayport, Miami, and Key Largo, Florida), representing about 56% of the South Atlantic-wide ex-vessel value for the species. The top community of Key West contributed about 17% of landings and about 16% of ex-vessel value of mutton snapper in 2014. Several Florida Keys communities (Key West, Key Largo, Islamorada, and Marathon) are included in the top communities and collectively represent about 42% of landings and 42% of ex-vessel value.

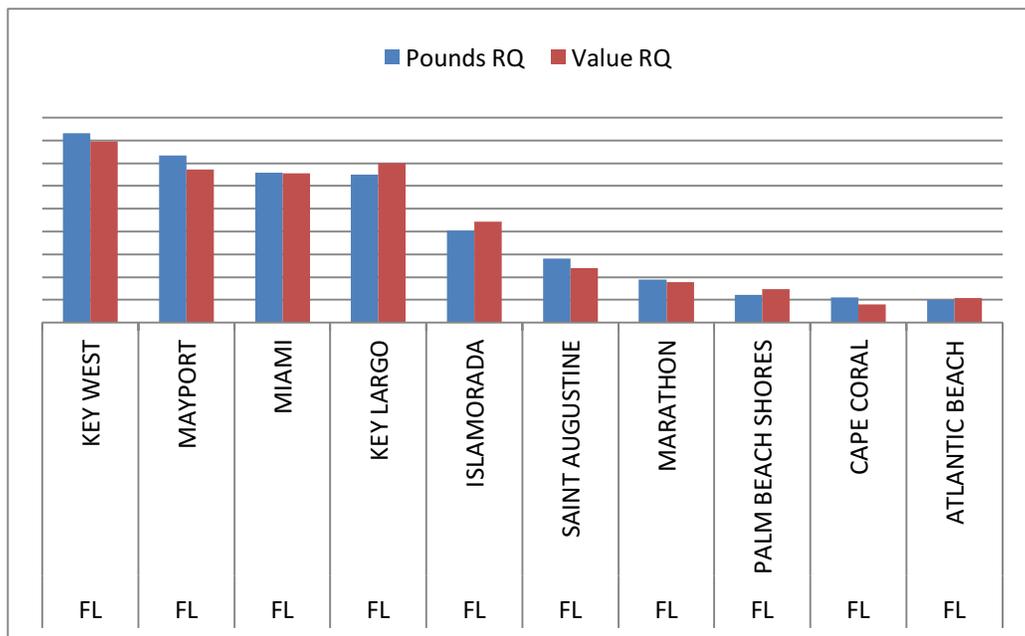


Figure 3.3.7. Top ten South Atlantic communities ranked by pounds and value of regional of quotient (RQ) of mutton snapper.

The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.

Source: SERO, Community ALS 2014.

The commercial engagement and reliance indices of the top commercial mutton snapper communities are included in **Figure 3.3.8**. The details of how these indices are generated are explained at the beginning of the Fishing Communities section. Two thresholds of one and one-half standard deviation above the mean were plotted to help determine a threshold for significance. The primary communities that demonstrate high levels of commercial fishing engagement include Key West, Miami, Key Largo, Islamorada, St. Augustine, and Marathon, Florida. Communities with substantial commercial reliance include Key West and Marathon, Florida.

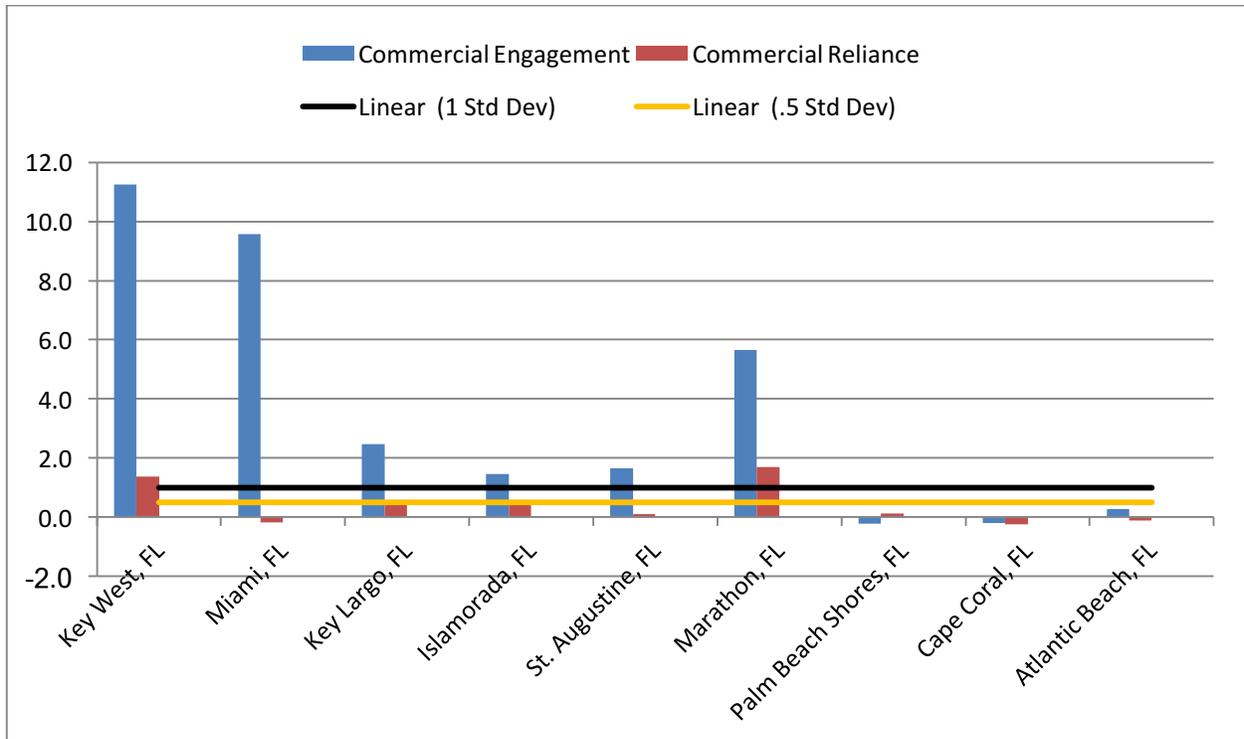


Figure 3.3.8. Commercial engagement and reliance for South Atlantic mutton snapper fishing communities.

Source: SERO, Social Indicators Database (2012).

Recreational Fishing Communities

Figure 3.3.9 identifies the Florida communities that are the most engaged and reliant on recreational fishing. Two thresholds of one and one-half standard deviation above the mean were plotted to help determine a threshold for significance. Communities are presented in ranked order by fishing engagement and all 15 included communities demonstrate high levels of recreational engagement. Five communities (Key West, Marathon, Islamorada, Ponce Inlet, and Big Pine Key) demonstrate high levels of recreational reliance.

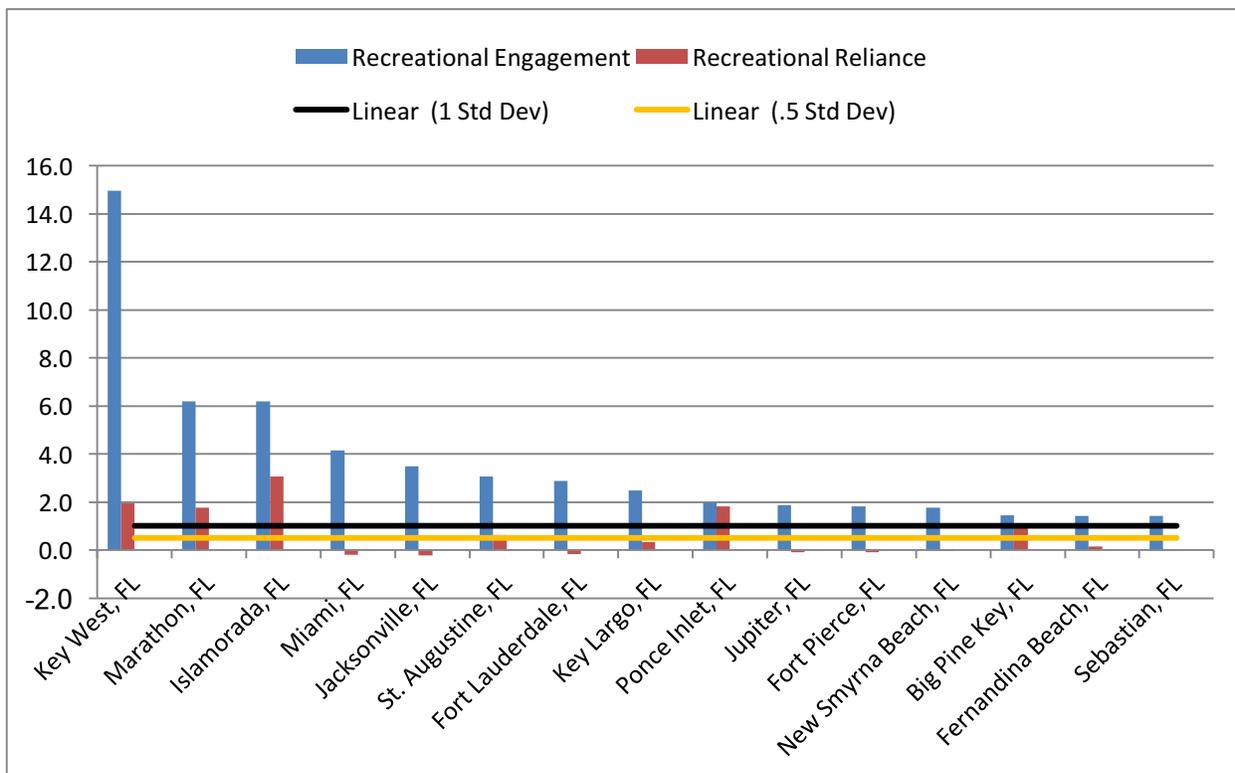


Figure 3.3.9. Top 15 Florida recreational fishing communities' engagement and reliance. Source: SERO, Social Indicators Database (2012).

3.3.3 Environmental Justice Considerations

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. The main focus of Executive Order 12898 is to consider “the 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...” This executive order is generally referred to as environmental justice (EJ).

Commercial and recreational fishermen and associated industries could be impacted by the proposed actions. However, information on the race and income status for groups at the different participation levels (individual fishermen and crew) is not available. Although information is available concerning communities overall status with regard to minorities and poverty (e.g., census data), such information is not available specific to fishermen and those involved in the industries and activities themselves. To help assess whether any environmental justice concerns arise from the actions in this amendment, a suite of indices were created to examine the social vulnerability of coastal communities. 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 and households with children under the age of five, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of populations experiencing vulnerabilities. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Figure 3.3.10 provides the social vulnerability of the top commercial and recreational communities. Several South Atlantic communities exceed the threshold of 0.5 standard deviation for at least one of the social vulnerability indices: Fernandina Beach, Fort Lauderdale, Fort Pierce, Jacksonville, and Miami, Florida. The communities of Fort Lauderdale, Fort Pierce, and Miami, Florida exceed the threshold for all three social vulnerability indices. These communities have substantial vulnerabilities and may be susceptible to further effects from any regulatory changes depending upon the direction and extent of that change.

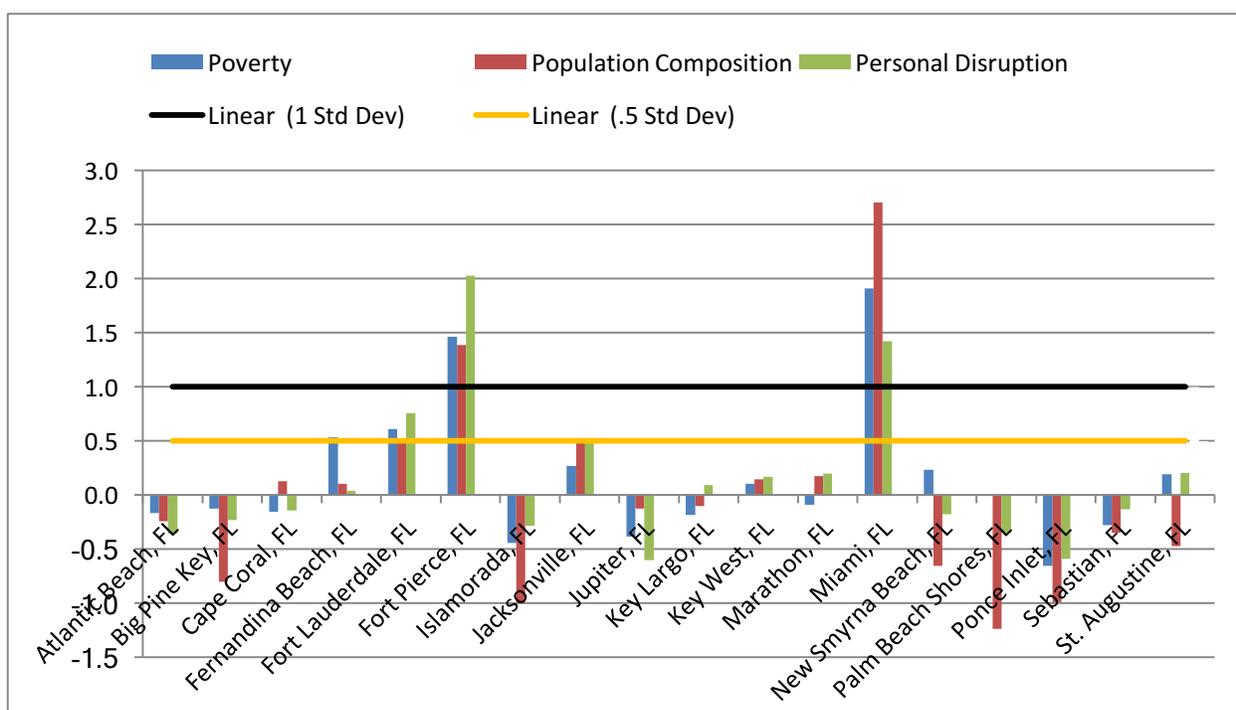


Figure 3.3.10. Social vulnerability indices for top commercial and recreational communities. Source: SERO, Social Indicators Database (2012).

People in these communities may be affected by fishing regulations in two ways: participation and employment. Although these communities may have the greatest potential for EJ concerns, no data are available on the race and income status for those involved in the local fishing industry (employment), or for their dependence on mutton snapper specifically (participation). Although no EJ issues have been identified, the absence of potential EJ concerns cannot be assumed.

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 Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the 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. The South Atlantic Council also established two voting seats for the Mid-Atlantic Council on the South Atlantic Mackerel Committee. 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 and legal 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 Environmental Quality. 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’s 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 NMFS 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 Schedule is available online at <http://www.gc.noaa.gov/enforce-office3.html>.

Chapter 4. Environmental Effects and Comparison of Alternatives

4.1 Action 1. Specify maximum sustainable yield (MSY) for mutton snapper in the South Atlantic Region

4.1.1 Biological Effects

The MSY is a reference point used by managers to assess fishery performance over the long term. Defining MSY for mutton snapper under **Preferred Alternative 2** would not alter the current harvest or use of the mutton snapper resource. Specification of MSY merely establishes a benchmark for resource evaluation on which additional management actions would be based, if necessary. MSY in **Alternative 1 (No Action)** is defined as the yield produced by F_{MSY} where $F_{30\%SPR}$ is used as a substitute, or proxy, for F_{MSY} and represents the overfishing level defined in Amendment 11 to the Snapper Grouper FMP (SAFMC 1998) for the mutton snapper stock in the South Atlantic and Gulf of Mexico.

Under **Alternative 1 (No Action)**, a yield (poundage) for MSY is not specified since one was not specified in Amendment 11 (SAFMC 1998). **Alternative 2 (Preferred)** would allow for periodic adjustments of F_{MSY} and MSY values based on estimates from new assessments without the need for a plan amendment.

As neither alternative under this action would have direct effects on resource harvest or use, biological effects would be neutral. However, **Alternative 2 (Preferred)**, which is recommended in the most recent stock assessment (SEDAR 15A Update 2015) and by the South Atlantic Fishery Management Council's (South Atlantic Council) Scientific and Statistical Committee (SSC), has a better scientific basis and thus provides a more solid ground for management actions that have economic and social implications. Bycatch and discards would not increase or decrease as a result of this action. For more information, see **Appendix D** (BPA).

The alternatives and sub-alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types used. Therefore,

*Alternatives**

1. No Action. MSY for mutton snapper in the South Atlantic equals the yield produced by F_{MSY} . $F_{30\%SPR}$ is used as the F_{MSY} proxy. The value is not specified.

2. MSY equals the yield produced by F_{MSY} or the F_{MSY} proxy. MSY and F_{MSY} are recommended by the most recent SEDAR/SSC.

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

there are no additional impacts on Endangered Species Act (ESA)-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on essential fish habitat (EFH) or EFH-habitat areas of particular concern (HAPCs) are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.1.2 Economic Effects

Defining the MSY for mutton snapper does not alter the current harvest or use of the resource. Specification of this measure merely establishes a benchmark for fishery and resource evaluation from which additional management actions for the species would be based, should comparison of the species and resource with the benchmark indicate that management adjustments are necessary. The impacts of these management adjustments would be evaluated at the time they are proposed. As a benchmark, MSY would not limit how, when, where, or with what frequency participants in the snapper grouper fishery engage in harvesting mutton snapper. This includes participants who directly utilize the resource (principally commercial vessels, for-hire operations, and recreational anglers), as well as participants associated with peripheral and support industries.

Since there would be no direct effects on resource harvest or use, **Alternative 1 (No Action)** and **Preferred Alternative 2** would have no direct economic effects on fishery participants, associated industries or communities. Any indirect economic effects are dependent on subsequent regulatory action.

4.1.3 Social Effects

Social effects of management specifications such as MSY for a stock would be associated with both the biological and economic effects of the MSY value. A MSY level that reflects the best available information (**Preferred Alternative 2**) is expected to contribute to achieving management goals and minimizing risk of overfishing for mutton snapper, resulting in greater expected long-term benefits to the commercial fleet and recreational fishermen who target mutton snapper than under **Alternative 1 (No Action)**.

4.1.4 Administrative Effects

The potential administrative effects of these alternatives differ in terms of the implied restrictions required to constrain the mutton snapper stock to recommended benchmarks. Defining a MSY value establishes a harvest goal for the mutton snapper portion of the snapper grouper fishery, for which management measures would be implemented. Those management measures would directly impact the administrative environment according to the level of conservativeness associated with the chosen MSY and subsequent restrictions placed on the fishery to constrain harvest levels. **Alternative 2 (Preferred)** differs from **Alternative 1 (No Action)** in that it would allow for periodic adjustments of F_{MSY} and MSY values based on

estimates from new assessments without the need for a fishery management plan amendment. As such, **Alternative 2 (Preferred)** would reduce the administrative burden from current levels. No significant changes in administrative effects are expected from **Alternative 2 (Preferred)** compared to **Alternative 1 (No Action)**.

4.2 Action 2. Specify minimum stock size threshold (MSST) for mutton snapper in the South Atlantic Region

4.2.1 Biological Effects

The MSST corresponds to the level of biomass below which a stock is considered overfished. If it is determined that a stock's biomass is below the MSST, the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires a rebuilding plan, which could result in harvest reductions.

SEDAR 15A Update (2015) estimated natural mortality for mutton snapper at 0.17. For species with such low natural mortality, such as mutton snapper, the biomass threshold for determining if the stock is overfished (MSST) under the current definition (**Alternatives 1 (No Action) and 2**) is very close to the biomass level when the stock is not considered overfished (SSB_{MSY}). Since **Alternative 1 (No Action)** nearly eliminates the buffer between MSST and SSB_{MSY} for stocks with low natural mortality rates, a stock would never be permitted to fall below SSB_{MSY} without triggering an "overfished" determination and mandatory development of a rebuilding plan. The most biologically conservative alternative is **Alternative 1 (No Action)**; however, under this alternative, development of a rebuilding plan may be required when it is not biologically necessary. The biological benefits of **Alternative 1 (No Action)** would take the form of increased harvest restrictions that would be implemented with the intent to rebuild the stock according to the current MSST threshold criterion. **Alternative 2** would be the least biologically beneficial since it would allow biomass to decrease by 50% before triggering the rebuilding plan requirement. **Preferred Alternative 3** would still require the development of a rebuilding plan if mutton snapper was deemed overfished, but would reduce the risk of requiring a rebuilding plan when decreased biomass was due to natural variations in recruitment.

Additionally, if the same management measures are used to rebuild a stock under all the alternatives considered, the stock would be expected to rebuild fastest under **Alternative 1 (No Action)** because the overfished threshold (MSST) would be closest to the rebuilt threshold SSB_{MSY} . Therefore, **Alternative 1 (No Action)** could be considered to have the greatest biological benefit among alternatives considered in this action. The tradeoff associated with the assurance provided by this conservative definition of MSST is that natural variation in recruitment could cause stock biomass to frequently alternate between an overfished and rebuilt condition (biomass at SSB_{MSY}), even if the fishing mortality rate applied to the stock was within the limits specified by the maximum fishing mortality threshold (MFMT). If realized, this situation could result in administrative and socio-economic burdens related to developing and implementing multiple rebuilding plans that may not be biologically necessary. However,

*Alternatives**

1 (No Action). MSST for mutton snapper is $MSST = SSB_{MSY} ((1-M) \text{ or } 0.5, \text{ whichever is greater})$. The value is not specified.

2. $MSST = 50\%$ of SSB_{MSY}

3. $MSST = 75\%$ of SSB_{MSY}

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

simulations on a wide variety of species by Restrepo et al. (1998) indicated that stocks at biomass levels approximating 75%SSB_{MSY} can rebuild to SSB_{MSY} fairly quickly with little constraint on fishing mortality. Therefore, it is not biologically necessary to have extremely small buffers between overfished and rebuilt thresholds.

Preferred Alternative 3, which would set MSST equal to 75%SSB_{MSY}, is consistent with how the South Atlantic Council has approached defining MSST for other snapper grouper stocks with low natural mortality estimates. The South Atlantic Council changed the MSST definition to 75%SSB_{MSY} for snowy grouper (SAFMC 2008a), golden tilefish (SAFMC 2008b), red grouper (SAFMC 2011d) and, more recently, other snapper grouper species (red snapper, blueline tilefish, gag, black grouper, yellowtail snapper, vermilion snapper, red porgy, and greater amberjack) (SAFMC 2014a). These species have low estimates of natural mortality, and the overfished threshold from the status quo MSST definition is very close to the biomass threshold when stocks are not considered overfished. The biological benefits of **Preferred Alternative 3**, which would trigger a rebuilding plan when biomass is at 75% of SSB_{MSY}, would be expected to be greater than **Alternative 2**, which would have a lower biomass threshold for an overfished determination (50%SSB_{MSY}). At their October 2013 meeting, the South Atlantic Council's SSC acknowledged that the 75%SSB_{MSY} approach is an acceptable choice for MSST, and they voiced no concern regarding the adoption of this management reference point for South Atlantic Council managed species. Bycatch and discards would not increase or decrease as a result of this action. For more information, see **Appendix D** (BPA).

The alternatives and sub-alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.2.2 Economic Effects

Like MSY, MSST does not alter the current harvest or use of the resource, and thus **Alternative 1 (No Action)**, **Alternative 2**, and **Preferred Alternative 3** would have no direct economic effects on fishery participants and associated industries or communities.

In general, a high MSST level is susceptible to triggering rebuilding actions that could limit harvest or fishing opportunities, thereby affecting the economic status of fishery participants, particularly in the short-term. A low MSST level would be associated with lower probability of enacting rebuilding actions that would alter the economic environment. To the extent that rebuilding actions necessitated by a chosen MSST would tend to have economic effects, it is possible to provide some general implications of the MSST alternatives.

With rebuilding taking place over a number of years, management actions and their economic consequences could change over time depending on a variety of factors, including the status of the stock and fishing conditions. **Alternative 2** would appear to be best from an economic standpoint in the short-term, because it is less likely to trigger restrictive rebuilding actions. One possible downside of this alternative is that once the stock is considered overfished, the required rebuilding actions could be more restrictive and potentially remain for a longer time, thereby increasing the severity of negative economic consequences for fishery participants. Additionally, allowing a stock to reach lower levels of abundance can have negative implications on both sectors through increased search or harvest costs and may impact effort. **Alternative 1 (No Action)** lies on the high end of the continuum for potential negative economic effects because it has the highest probability of triggering restrictive rebuilding actions. A likely mitigating factor with **Alternative 1 (No Action)** is the possibility that the required management actions would have adverse economic effects that would not last as long or not be as severe. However, a frequently varying regulatory regime would tend to de-stabilize business planning and fishing decisions, which could have potentially worse economic consequences. The economic implications of **Preferred Alternative 3** and its sub-alternatives may be characterized as falling between **Alternative 1 (No Action)** and **Alternative 2**.

4.2.3 Social Effects

Social effects of revised biological parameters such as MSST for a stock would be associated with both the biological and economic effects of the modified MSST value. The estimated SSB as compared to MSST serves as a reference point for designating a stock as overfished. If the reference point is not accurately representing the stock status, the outcomes of the ‘overfished’ designation when a stock is not overfished can have negative long and short-term social effects associated with restricted or no access to the fish. Conversely, if an inaccurate proxy results in a stock designated as not overfished when it *is* overfished, the fishing fleets, associated businesses and communities could be negatively impacted in the long term due to decline in the stock and negative broader biological impacts of overfishing. Lastly, an inaccurate proxy that causes a stock to fluctuate between overfished and not overfished would likely have negative effects on fishermen by requiring changes in regulations on harvest too often. This could negatively affect stability and planning for fishing businesses, in addition to fishing opportunities for recreational anglers, due to inconsistent access to the resource. Although for some fishermen, any access to a stock would be beneficial, the positive effects of consistency in regulations (even if access is restricted) and stability in the fishery would also be expected from a more fixed designation as overfished or not overfished.

Under all alternatives, fishermen could be affected by future restricted access to mutton snapper due to an overfished designation, which could have negative effects on associated fishing businesses and communities. Although **Preferred Alternative 3** is the more restrictive approach to set the MSST than under **Alternatives 1 (No Action)** and **2**, it would also be the most likely to trigger an overfished status, which may avoid more severe biological impacts to the stock.

4.2.4 Administrative Effects

The MSST is the level of biomass below which a species would be considered overfished and is thus tied to implementation of management measures. Those management measures would directly impact the administrative environment according to the level of conservativeness associated with the chosen MSST and subsequent restrictions placed on the species to constrain harvest levels. The larger the buffer between MSST and SSB_{MSY} , the lower the probability that mutton snapper would be considered overfished and require a rebuilding plan. Therefore, administrative effects would be lowest for **Alternative 3 (Preferred)**, followed by **Alternative 2** and **Alternative 1 (No Action)**.

4.3 Action 3. Revise annual catch limits (ACLs) and optimum yield (OY) for mutton snapper in the South Atlantic Region

4.3.1 Biological Effects

Average commercial landings of mutton snapper in the South Atlantic from 2010 to 2014 were 76,684 lbs ww (**Table 4.3.1**). This is below the commercial ACLs proposed in **Sub-alternatives 2a (Preferred), 2b, and 2c**, which range from 111,354 lbs ww to 90,014 lbs ww, respectively (**Table 4.3.2**). If commercial catch rates in 2017 are similar to those in 2010-2014, it is not expected that the commercial ACL would be met under any of the proposed alternatives.

Table 4.3.1. Commercial and recreational landings of mutton snapper, by sector, for the South Atlantic region, 2010-2014.

Year	Recreational		Commercial	Total
	number	lbs ww	lbs ww	lbs ww
2010	130,249	477,647	74,737	552,384
2011	60,151	251,446	66,158	317,604
2012	86,108	505,583	77,122	582,705
2013	126,241	660,449	74,229	734,678
2014	157,501	538,122	91,173	629,295
Mean	112,050	486,650	76,684	563,333

Proposed recreational ACLs (in numbers of fish) for 2017 are 116,127 fish under **Preferred Sub-alternative 2a**, 110,321 fish under **Sub-alternative 2b**, and 104,514 fish under **Sub-alternative 2c (Table 4.3.2)**. The average of mutton snapper recreational landings from 2010-2014 is 112,050 fish (**Table 4.3.1**). Hence, it is possible that the recreational ACL would be harvested once Amendment 41 is implemented if harvest rates are comparable to those in 2010-2014. The South Atlantic Council is considering changes to the recreational bag limit (**Action 7**) partly to spread out the harvest and prevent a recreational closure.

Sub-alternatives 2b and 2c would have a greater long-term positive biological effect than **Preferred Sub-alternative 2a** because they would create a buffer between the ACL/OY and ABC, with **Sub-alternative 2c** setting the most conservative ACL at 90% of the ABC (**Table 4.3.2**). Creating a buffer between the ACL/OY and ABC, as proposed under **Sub-alternatives**

Alternatives*

1 (No Action). The current ABC for mutton snapper is 926,600 lbs ww based on a jurisdictional allocation for the South Atlantic of 82% of the ABC and is set equal to OY and the total ACL. The commercial ACL is 157,743 lbs ww (17.02%) and the recreational ACL is 768,857 lbs ww (82.98%).

2. Specify ACLs and OY for the South Atlantic using the existing sector allocations (17.02% commercial and 82.98% recreational) and specify the recreational ACL in numbers of fish. The ACLs specified for 2020 would remain in place until modified.

Sub-alternative 2a. ACL = OY = ABC.

Sub-alternative 2b. ACL = OY = 95% ABC.

Sub-alternative 2c. ACL = OY = 90% ABC.

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

2b and **2c**, would provide greater assurance that overfishing is prevented, and the long-term average biomass is near or above SSB_{MSY} . **Preferred Sub-alternative 2a** would set the ACL equal to the ABC (and OY) leaving no buffer between the two harvest parameters, which may increase risk that harvest could exceed the ABC. As such, **Preferred Sub-alternative 2a** is the least biologically beneficial of the sub-alternatives considered under this action. However, the South Atlantic Council’s ABC control rule takes into account scientific uncertainty. The Magnuson-Stevens Act National Standard 1 (NS 1) guidelines indicate an ACL may typically be set very close to the ABC. Setting a buffer between the ACL and ABC would be appropriate in situations where there is uncertainty in whether or not management measures are constraining fishing mortality to target levels. An annual catch target (ACT), which is not required, can also be set below the ACL to account for management uncertainty and provide greater assurance overfishing does not occur (see **Section 1.5**). **Alternative 1 (No Action)** no longer represents the best scientific information available since it would ignore the recent update to the mutton snapper stock assessment (SEDAR 15A Update 2015) and, therefore, is not a reasonable alternative.

Table 4.3.2. Proposed acceptable biological catch values and annual catch limits for mutton snapper in the South Atlantic based on **Sub-alternatives 2a (Preferred)-2c**.

Preferred Sub-alt 2a - ACL = OY = ABC						
Year	Total ABC (SA + Gulf) num	SA ABC num	Yield ABC lbs	Comm ACL (lbs)	Comm ACL (num)	Rec ACL (num)
2017	157,500	129,150	587,633	100,015	13,023	116,127
2018	164,500	134,890	612,401	104,231	13,572	121,318
2019	169,300	138,826	634,435	107,981	14,060	124,766
2020	172,700	141,614	654,257	111,354	14,499	127,115

Sub-alt 2b - ACL = OY = 95% ABC						
Year	Total ABC (SA + Gulf) num	SA ABC num	Yield ABC lbs	Comm ACL (lbs)	Comm ACL (num)	Rec ACL (num)
2017	157,500	122,693	558,251	95,014	12,372	110,321
2018	164,500	128,146	581,781	99,019	12,893	115,252
2019	169,300	131,885	602,713	102,582	13,357	118,528
2020	172,700	134,533	621,544	105,787	13,774	120,759

Sub-alt 2c - ACL = OY = 90% ABC						
Year	Total ABC (SA + Gulf) num	SA ABC num	Yield ABC lbs	Comm ACL (lbs)	Comm ACL (num)	Rec ACL (num)
2017	157,500	116,235	528,869	90,014	11,721	104,514
2018	164,500	121,401	551,161	93,808	12,215	109,186
2019	169,300	124,943	570,991	97,183	12,654	112,289
2020	172,700	127,453	588,831	100,219	13,049	114,403

Preferred Sub-alternative 2a, Sub-alternative 2b, and Sub-alternative 2c would set OY equal to the ACL. The South Atlantic Council and their SSC have established an ABC control rule that takes into consideration scientific and management uncertainty to ensure catches are maintained below OFL. The South Atlantic Council considered alternatives in the Comprehensive ACL Amendment (SAFMC 2011c) and Amendment 24 to the Snapper Grouper FMP (SAFMC 2011d) that would set the ACL below the ABC but selected ACL=OY=ABC as their preferred alternative. More recently, the South Atlantic Council has frequently set ACLs for snapper grouper species at the same level as the ABC. However, accountability measures (AMs) and ACLs are in place to ensure overfishing of mutton snapper does not occur. Therefore, there is a low risk of exceeding the commercial and recreational ACLs, and **Preferred Alternative 2** and its sub-alternatives can be used as part of a successful harvest management system for mutton snapper with little risk of overfishing.

The South Atlantic Council prefers specifying the recreational ACL in numbers of fish and the commercial ACL in pounds. The rationale is that recreational landings are already tracked in numbers of fish while commercial landings are tracked in pounds. Issues develop, however, when different size limits are considered for management and the commercial and recreational ACLs are in different units. If the minimum size limit is increased, the average size, and therefore weight, of fish harvested would also increase. If the method for converting between an ACL in pounds and an ACL in numbers does not address the change in average weight, the expected increase in the average weight of landed fish could lead to the poundage associated with the ACL specified in numbers exceeding the ACL expressed in pounds. This could also result in a perceived shift in allocations when they are compared in the original units across sectors, and if the change in weight landed is great enough, the ABC and overfishing limit (OFL) in pounds could be exceeded. To avoid these issues, the method described in **Appendix J** was used to specify the ABC (and OY) and recreational ACL for mutton snapper in numbers of fish. This method is designed to keep the numbers of fish harvested constant while allowing the yield to vary based on the possible change in selectivity due to changes in the minimum size limit. Specifying the ABC (and OY) and recreational ACL in numbers results in a lower risk of exceeding the recreational ACL due to an increase in the minimum size limit.

When compared to **Alternative 1 (No Action)**, lowering the ACL under the each of the sub-alternatives for **Preferred Alternative 2** could result in more discards; however, other actions are considered in this amendment that could help prevent the ACL from being exceeded (**Actions 5 through 8**). Additionally the new Commercial Landings Monitoring System and actions in the Joint Generic Dealer and Generic For-Hire Reporting amendments are expected to provide more timely and accurate data reporting and would thus reduce the incidence of quota overages. See **Appendix D** (BPA) for information on bycatch and discards.

The alternatives and sub-alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types used. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs

are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.3.2 Economic Effects

In general, ACLs that allow for more fish to be landed can result in increased positive economic effects if harvest increases. The ACL does not directly impact a species or species complex unless harvest increases or the ACL is exceeded, thereby triggering AMs such as closures or other restrictive measure. As such, ACLs that are set above the observed landings of a species or species complex do not have realized economic effects. For the commercial sector, even though ACLs under all of the sub-alternatives of **Preferred Alternative 2** are lower than the ACL for **Alternative 1 (No Action)**, it is unlikely that the commercial sector would close due to reaching its mutton snapper ACL, assuming future commercial landings reflect average landings from 2010-2014 (**Tables 4.3.1** and **4.3.2**). Therefore, there are no expected differences for the commercial sector in terms of realized economic effects among the actions and sub-alternatives. Over the long term, all of the sub-alternatives would allow for some expansion of the commercial sector and increased economic benefits for the sector, with **Preferred Sub-alternative 2a** offering the greatest potential increase; however, it is not expected based on previous commercial landings.

The recreational sector experiences more variability in mutton snapper landings from year to year than the commercial sector. Using average recreational landings from 2010-2014 and associated consumer surplus estimates (CS) as a baseline (**Table 4.3.3**), the estimated short-term (2017) changes in CS resulting from the ACLs specified in **Alternative 1 (No Action)** and **Preferred Alternative 2** are presented in **Table 4.3.4**. These estimates are calculated using two proxy values of CS for recreationally caught mutton snapper. Haab et al. (2012) estimated the CS (willingness to pay (WTP) for one additional fish caught and kept) for snappers and groupers in the southeastern U.S. using four separate econometric modeling techniques. It is assumed that snapper is a better proxy for mutton snapper than grouper; however, any CS estimates derived for mutton snapper using “snapper” as a proxy should be viewed as ballpark estimates only. The finite mixture model, which takes into account variation in the preferences of fishermen, had the best prediction rates of the four models. The WTP for an additional snapper (excluding red snapper) estimated by this model was \$12.38 (2015 dollars) with a 95% confidence interval (CI) of \$8.26 to \$17.89. The WTP for an additional snapper from the mixed-logit model was higher at \$30.29 (2015 dollars) with a 95% CI of \$20.64 to \$39.92. Due to the variation in proxy values, both are shown to provide an upper and lower estimates of CS and the changes in CS.

Table 4.3.3. Estimated consumer surplus (2015 \$) for recreational mutton snapper landings, 2010-2014.

Year	Recreational Landings (numbers)	Rec CS- Snapper (Finite Mixture Model)	Rec CS- Snapper (Mixed Logit Model)
2010	130,249	\$1,612,483	\$3,945,242
2011	60,151	\$744,669	\$1,821,974
2012	86,108	\$1,066,017	\$2,608,211
2013	126,241	\$1,562,864	\$3,823,840
2014	157,501	\$1,949,862	\$4,770,705
Average	112,050	\$1,387,179	\$3,393,995

Table 4.3.4. Estimated change in recreational landings and associated change in consumer surplus (CS) (in 2015 \$) under **Preferred Alternative 2** based on average recreational landings of mutton snapper from 2010-2014.

	Estimated Reduction in Landings (number of fish)	Decrease in Consumer Surplus(Finite Mixture Model: \$12.38 per fish)	Decrease in Consumer Surplus (Mixed Logit Model: \$30.29 per fish)
Alternative 1 (No Action)	0	\$0	\$0
Sub-alternative 2a	0	\$0	\$0
Sub-alternative 2b	1,729	\$21,405	\$52,371
Sub-alternative 2c	7,536	\$93,296	\$228,265

Since the ACLs specified for 2017 in **Alternative 1 (No Action)** and **Preferred Sub-alternative 2a** (Table 4.3.2) are higher than the average recreational landings over the 2010-2014 time series (Table 4.3.1), there are no anticipated economic effects that would be realized by the recreational sector. **Sub-alternative 2c** has the largest anticipated negative economic effect, as it has the lowest recreational ACL and is estimated to decrease CS by \$93,296 to \$228,265 (2015 dollars) compared to the baseline. **Sub-alternative 2b** has less potential for negative economic effects compared to **Sub-alternative 2c**, but is still estimated to decrease CS by \$21,405 to \$52,371 (2015 dollars) (Table 4.3.4). For all sub-alternatives of **Preferred Alternative 2**, the ACL is projected to increase in years following 2017, therefore the loss of CS is expected to be smaller in these years and the economic effects may even be neutral or turn to a net gain in CS, depending on the observed landings of mutton snapper and the sub-alternative that is chosen.

4.3.3 Social Effects

The ACL for any stock does not directly affect resource users unless the ACL is met or exceeded, in which case AMs that restrict or close harvest could negatively impact the commercial fleet, for-hire fleet, and private anglers. AMs can have significant direct and indirect

social effects because, when triggered, they can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects, such as increased pressure on another species, or fishermen having to stop fishing all together due to regulatory closures. However, restrictions on harvest contribute to sustainable management goals, and are expected to be beneficial to fishermen and communities in the long-term.

Section 3.3.2 describes communities that could be affected by changes to mutton snapper management, particularly in the Florida Keys. Mutton snapper is an important species for the recreational sector in south Florida. Changes in access to mutton snapper could also affect fish houses and restaurants that depend on a steady supply of the fish.

Under **Preferred Alternative 2**, the ACL for mutton snapper would be based on the most recent stock assessment. Additionally, the proposed ACLs are higher than recent recreational and commercial landings, and would not be expected to have negative effects on fishermen by restricting access if an AM was triggered. However, growth in the mutton snapper portion of the snapper grouper fishery in the future is possible and could be due to switching target species if harvest for other species close or other factors increase effort. If there is a growth in effort and catch for mutton snapper, this could result in early closures, paybacks, or other management measures that could restrict access to the mutton snapper resource. **Sub-alternative 2c** could result in the lowest ACLs, followed by **Sub-alternative 2b** and **Preferred Sub-alternative 2a**. However, under current conditions, the effects on fishermen of all sub-alternatives are expected to be the same.

Alternative 1 (No Action), although it is not based on the most recent stock assessment, would allow the most access to the mutton snapper because of the larger ACL, and be the most beneficial to commercial and recreational fishermen who target mutton snapper if there is growth in this portion of the snapper grouper fishery in the future. However, under current conditions, the ACL under **Alternative 1 (No Action)** would have the same effects on fishermen as **Preferred Alternative 2**. Additionally, if the ACL is not updated based on the most recent information from the stock assessment and this results in negative biological effects on the stock under **Alternative 1 (No Action)**, fishermen and associated communities and businesses could be negatively affected in the future.

4.3.4 Administrative Effects

Modifying the ACLs and OY for mutton snapper would not have direct impacts on the administrative environment. Annual catch limits are already in place for mutton snapper and therefore, negative administrative impacts of this action are likely to be minimal. **Alternative 1 (No Action)**, **Sub-alternatives 2a (Preferred)**, **2b**, and **2c** would not result in significant administrative cost or time burdens other than notifying fishery participants of the change in the sector ACLs and continued monitoring of the sector ACLs. The burden on law enforcement

would not change under either alternative since commercial quota closures and bag limits implemented are currently enforced.

4.4 Action 4. Revise recreational annual catch target (ACT) for mutton snapper in the South Atlantic Region

4.4.1 Biological Effects

As explained in Sections 1.5 and 2.4, ACTs can be used to prevent ACLs from being exceeded. In managing the snapper grouper fishery, however, the South Atlantic Council has chosen not to use ACTs to trigger AMs because it is anticipated that improvements in reporting will significantly reduce management uncertainty. Since the ACT is typically set lower and would be reached sooner than the ACL, using an ACT rather than the ACL as a trigger for AMs in the recreational sector may prevent an ACL overage. This more conservative approach, would likely help to ensure that recreational data uncertainties do not cause or contribute to excessive ACL overages for vulnerable species. Using recreational ACTs rather than the ACLs to trigger recreational AMs may not eliminate ACL overages completely; however, using such a strategy for the recreational sector may reduce the need to compensate for very large overages.

Table 4.4.1 shows recreational ACTs (in numbers of fish) for mutton snapper under each of the proposed ACL alternatives from Action 3.

*Alternatives**

1 (No Action). The current ACT is 668,906 lbs ww and applies to mutton snapper throughout the South Atlantic Council's jurisdiction. The ACT = recreational $ACL \times (1 - PSE)$ or $ACL \times 0.5$, whichever is greater, and where Percent Standard Error (PSE) = 13% = average PSE 2005-2009 (for South Atlantic only).

2. Revise the ACT for mutton snapper for the recreational sector and specify in numbers of fish. The ACT for 2020 would remain in place until modified.

Sub-alternative 2a. ACT = recreational $ACL \times (1 - PSE)$ or $ACL \times 0.5$, whichever is greater.

Sub-alternative 2b. ACT = 85% recreational ACL.

Sub-alternative 2c. ACT = 75% recreational ACL.

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

Table 4.4.1. Proposed recreational annual catch targets (ACTs) in numbers of fish for each of the proposed annual catch limit alternatives under **Action 3**.

Preferred Sub-alternative 2a (Action 3): ACL = OY = ABC				
Year	Rec ACL (num)	Sub-alt 2a	Pref Sub-alt 2b	Sub-alt 2c
2017	116,127	97,663	98,708	87,095
2018	121,318	102,029	103,121	90,989
2019	124,766	104,928	106,051	93,574
2020 onwards	127,115	106,903	108,048	95,336
Sub-alternative 2b (Action 3): ACL = OY = 95%ABC				
2017	110,321	92,780	93,773	82,741
2018	115,252	96,927	97,965	86,439
2019	118,528	99,682	100,749	88,896
2020 onwards	120,759	101,558	102,645	90,569
Sub-alternative 2c (Action 3): ACL = OY = 90%ABC				
2017	104,514	87,897	88,837	78,386
2018	109,186	91,826	92,809	81,890
2019	112,289	94,435	95,446	84,217
2020 onwards	114,403	96,213	97,243	85,802

The current recreational ACT (**Alternative 1 (No Action)**) for mutton snapper in the South Atlantic Council’s area of jurisdiction is 668,906 lbs ww. Since the South Atlantic Council proposes to specify the recreational ACL for mutton snapper in numbers of fish (**Action 3**), **Alternative 1 (No Action)** is not a reasonable alternative as there would be no consistency in the units. In addition, retaining the current ACT would ignore the results of the recent update to the mutton snapper stock assessment (SEDAR 15A Update 2015). Because the South Atlantic Council has not employed ACTs in its management strategy for the snapper grouper fishery, the biological effects of **Preferred Alternative 2** and its sub-alternatives would be neutral. Of the sub-alternatives under **Preferred Alternative 2**, **Preferred Sub-alternative 2b** proposes the highest values. That is, if AMs were tied to the recreational ACT, they would be triggered less frequently than under **Sub-alternative 2a** or **2c**. However, as stated previously, recreational ACTs are currently not an active part of the management strategy for snapper grouper species and accountability measures are in place to ensure that ACLs are not exceeded.

This action would not be expected to affect discards and/or bycatch, since the only consequence of reaching the ACT would be to continue to monitor the landings, which the Marine Recreational Information Program does continually. For more information on bycatch and discards, see **Appendix D** (BPA).

The alternatives and sub-alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types used. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.4.2 Economic Effects

The purpose of establishing ACTs is to help prevent a sector from exceeding its ACLs due to management uncertainty. Exceeding an ACL would have direct negative economic effects on all sectors potentially due to a reduced stock size. While not currently overfished, should mutton snapper become overfished, the sector that exceeded its ACL would have its future ACL reduced by the amount of the overage. Without being able to predict exactly how much precaution is needed in setting the ACL, it is difficult to compare alternatives. However, if a species were closed too early for a sector based on the ACT, there would be direct negative economic effects as well because the sector would be prohibited from harvesting fish. The ACT being established by this action only applies to the recreational sector and is not tied to the AMs; therefore, the realized economic effects of **Action 4** are expected to be minimal. There are no commercial ACTs being proposed as commercial reporting requirements allow for the commercial sector to be closed comparatively more quickly when the commercial sector ACL is met or projected to be met.

While there currently are no AMs triggered by the ACT for mutton snapper, there is the potential for AMs to be tied to the ACT in the future, thereby creating economic effects. **Sub-alternative 2c** provides the largest step-down from the ACL to the ACT and would create the largest potential negative economic effect if set as trigger for the AMs, while **Preferred Sub-alternative 2b** provides the smallest step-down from the ACL to the ACT, thereby leading to the smallest potential negative economic effect. **Sub-alternative 2a** falls in between the other two sub-alternatives. **Alternative 1 (No Action)** is not a viable alternative but the economic effects would be most comparable to **Sub-alternative 2a**, as it uses similar methodology in setting the recreational ACT for mutton snapper.

4.4.3 Social Effects

Establishment of a recreational ACT for mutton snapper would likely have little effects on recreational fishermen targeting mutton snapper, unless the South Atlantic Council decides to set the ACT as a trigger for AMs at a later time. A higher ACT could be more beneficial for fishermen, depending on the levels specified in **Preferred Alternative 2**, and it would be expected that **Preferred Sub-alternative 2b** would be the most beneficial, followed by **Sub-alternative 2a** and then **Sub-alternative 2c (Table 2.4.1.)**. Because the ACT is used for monitoring only, it is expected that the social effects of **Alternative 1 (No Action)** and the sub-alternatives under **Preferred Alternative 2** would be the similar.

4.4.4 Administrative Effects

Under this action, it is important to note that recreational data collection can be more administratively burdensome due to time delays and lengthy reviews. Specifying an ACT alone would not increase the administrative burden over the status quo, other than adding an additional layer of precautionary monitoring to the system of AMs. In-season monitoring needed for tracking how much of the ACT has been harvested throughout a particular fishing season can potentially result in a need for additional cost and personnel resources if a monitoring

mechanism is not already in place. However, because the ACT alternatives as they are presented here do not trigger any corrective or preventative action, no additional in-season monitoring is required regardless of where the ACT level is set. Therefore, there is no difference in the potential administrative impacts associated with **Sub-alternatives 2a, 2b (Preferred), and 2c** when compared with **Alternative 1 (No Action)**.

4.5 Action 5. Modify the commercial and recreational minimum size limit for mutton snapper in the South Atlantic Region

4.5.1 Biological Effects

According to the report for the SEDAR 15A (2008) assessment of the mutton snapper stock, 50% of females achieved sexual maturity at 353 mm TL (14 inches TL) and 2.07 years of age. However, Claro (1981) reported a size at 50% maturity (L50) for this species at 520 mm fork length (FL; ca. 574 mm TL; 20 inches) and 5-6 years of age. Similarly, Figuerola and Torres (2001), using histological criteria, reported a length at 50% maturity of 414 mm FL (ca. 459 mm TL; 18 inches TL) for mutton snapper in Puerto Rico. The SEDAR 15A (2008) report further states: “A shift in cohort-specific maturity schedules over time is consistent with a genetic change at the population level, and a change towards smaller size at maturity is consistent with the expected life-history response to high rates of selective exploitation (Marshall and Browman 2007). If the data of prior estimates from Caribbean populations is indicative of fishes inhabiting Florida waters in the past, then current estimates of size-at-maturity are comparatively small and may indicate growth overfishing in the Florida population.”

More recently, Sadovy de Mitchesen and Colin (2011) report that male mutton snapper reach sexual maturity at 16 inches FL and females at 18 inches FL. Therefore, **Alternative 1 (No Action)** would not be as biologically beneficial as the alternatives considered under this action because it allows harvest of some reproductively immature individuals. **Alternatives 2-5** would impart biological benefits to the mutton snapper population by allowing more individuals to reach reproductive activity before being harvested. Of these, **Alternatives 4 and 5** would be more biologically beneficial than **Preferred Alternative 3** or **Alternative 2** as they would presumably encompass all the reproductively active individuals in the population. Hence, biological benefits would be greatest under **Alternative 5** and decrease with each subsequent alternative in diminishing order.

Table 4.5.1 presents projected landings for the different minimum size limit alternatives being considered. The table also presents predicted percent reductions in landings from the status quo. Under the South Atlantic Council’s **Preferred Alternative 3** (18 inches TL), recreational landings of mutton snapper at the current 10-fish bag limit are expected to decrease by about 55%. Minimum size limits of 19 and 20 inches TL (**Alternatives 4 and 5**, respectively), would each further reduce recreational landings by 58% and 61%, respectively. Overall, all of the minimum size limits alternatives being considered result in substantial decreases in projected landings.

*Alternatives**

1 (No Action). The minimum size limit (MSL) for mutton snapper in the South Atlantic region is 16 inches total length (TL).

2. Increase to 17 inches TL.

3. Increase to 18 inches TL.

4. Increase to 19 inches TL.

5. Increase to 20 inches TL.

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

Table 4.5.1. Projected recreational landings of mutton snapper (numbers of fish) and closure dates for each of the three proposed ACLs, under the current bag limit (10 mutton snapper within the aggregate), and with no further restrictions during May and June. Preferred minimum size limit alternative in bold.

Size Limit	Bag Limit	Estimated Landings	% Reduction	Projected Closure Date		
				ACL=ABC	ACL=95%ABC	ACL=90%ABC
16	10	111,966	0.0%	No	27-Dec	9-Dec
17	10	56,284	49.7%	No	No	No
18 (Pref)	10	50,597	54.8%	No	No	No
19	10	46,907	58.1%	No	No	No
20	10	44,173	60.6%	No	No	No

Source: SAFMC

The size composition of mutton snapper reported through MRIP from 2010 through 2014 (**Figure 4.5.1**) shows that a large proportion of the landed fish are at or below the current 16 inch minimum size in most years and for areas north of the Florida Keys (**Figure 4.5.2**). Similarly, the headboat sector, on average, has reported catching mutton snapper at the 16-inch minimum size limit. Therefore, if the minimum size limit were to increase as proposed under **Alternatives 2** through **5**, regulatory discards would be expected to increase for some time as the population “grows into” the new minimum size limit. However, according to the SEDAR 15A Update (2015), there have been few instances of mutton snapper being discarded dead since the recreational landings survey was initiated in 1979 (initially the Marine Recreational Statistical Survey and later Marine Recreational Information Program) and recreational fishermen have reported high release survival of mutton snapper. The SEDAR 15A Update (2015) used a 15% discard mortality rate to estimate levels of dead discards. Hence, biological effects from the expected increase in dead discards under **Preferred Alternative 3** are expected to be minimal and similar across the minimum size limit alternatives considered under this action. **Alternative 1 (No Action)** would not result in an increase in regulatory discards and, therefore, would be the most beneficial among the alternatives considered in terms of reducing discards.

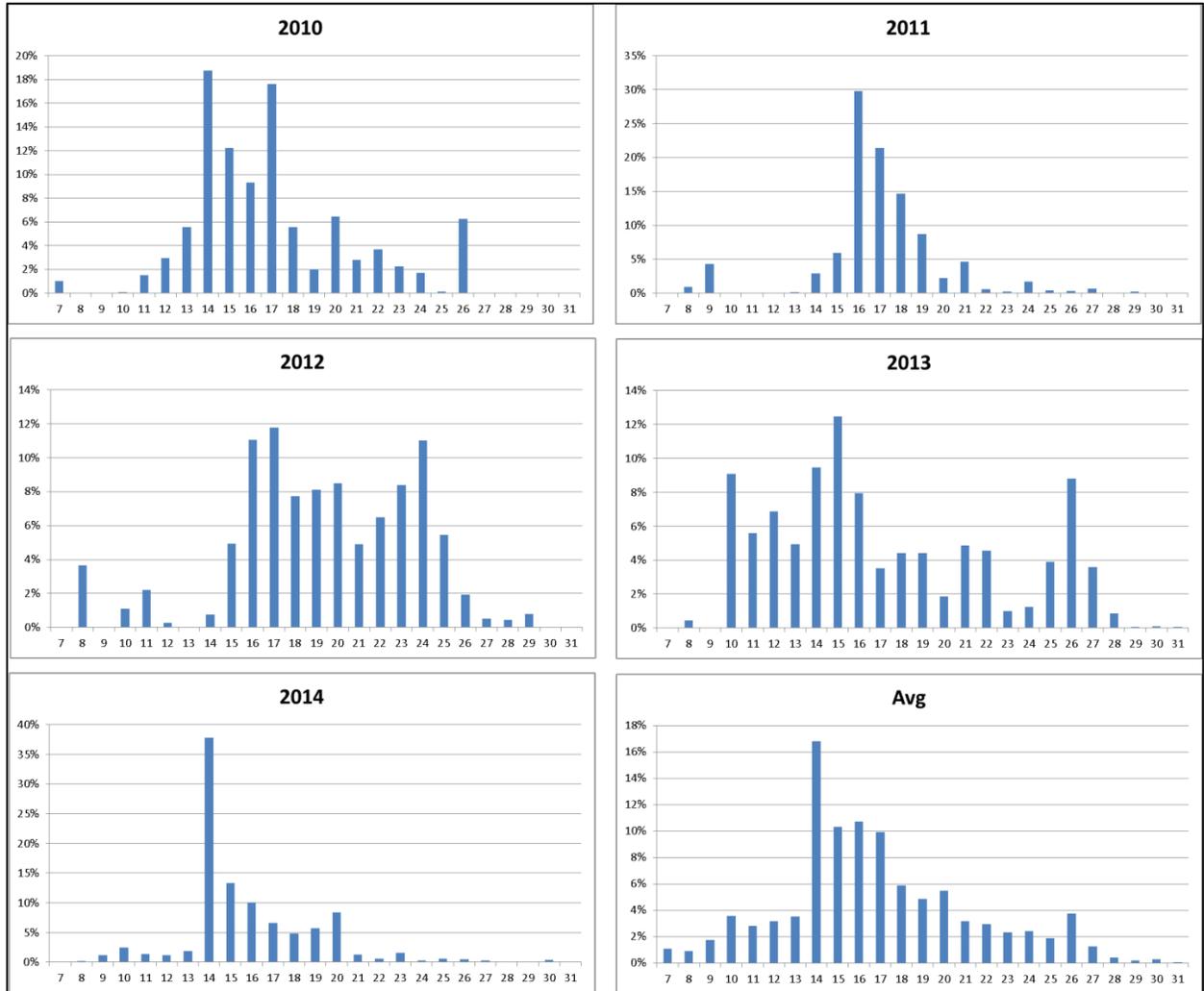


Figure 4.5.1. Size composition (inches total length) of recreational mutton snapper landings in the South Atlantic, 2010-2014 as estimated by the Marine Recreational Information Program.
 Source: Marine Recreational Information Program.

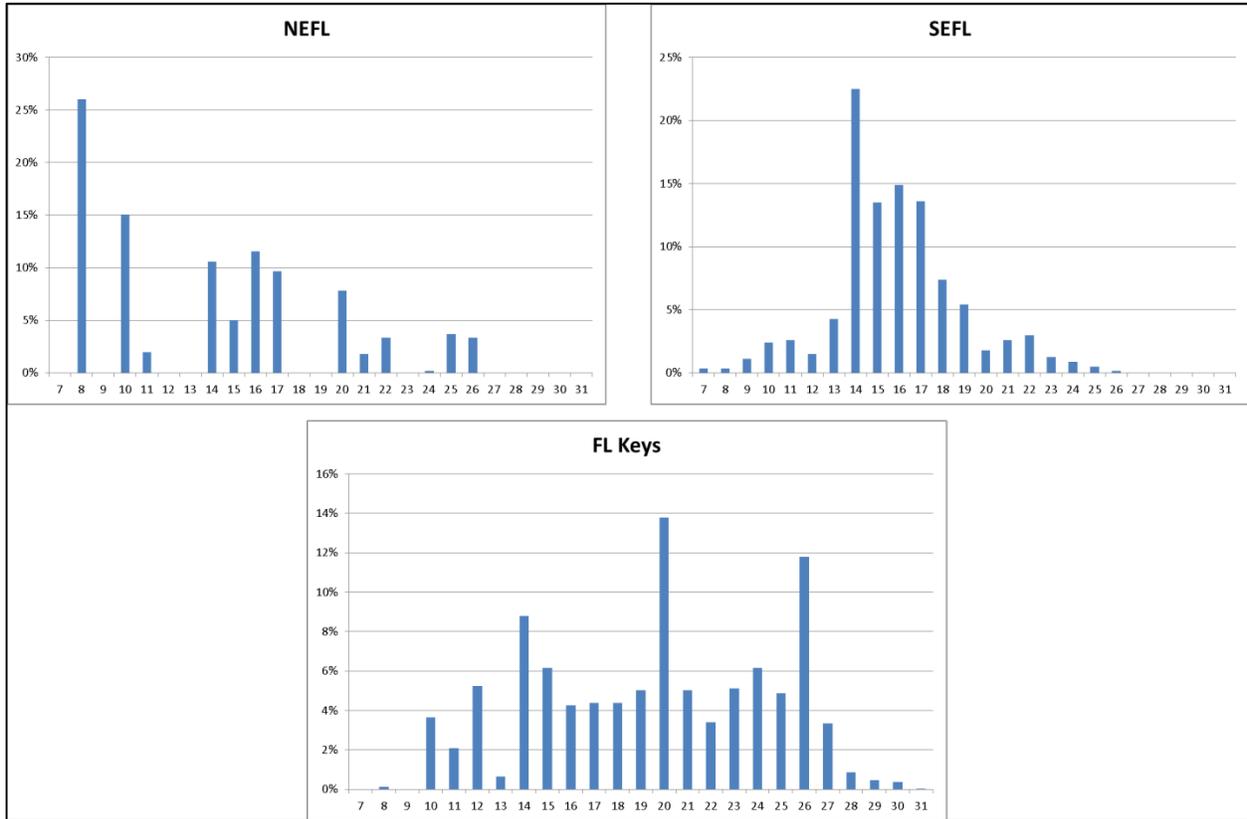


Figure 4.5.2. Size composition (inches total length) of recreational mutton snapper landings by area, 2010-2014. NEFL = Northeast Florida; SEFL=southeast Florida
 Source: Marine Recreational Information Program

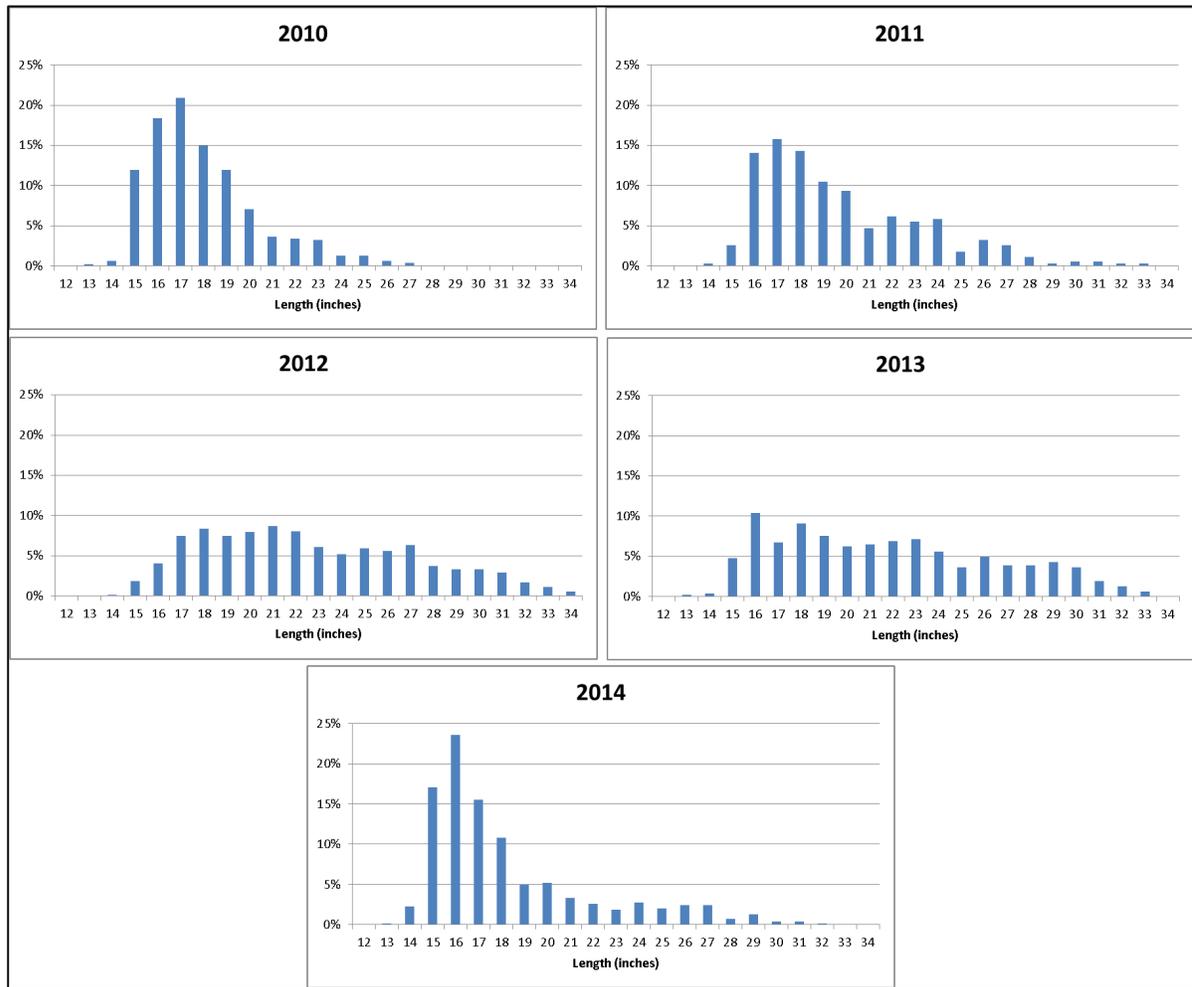


Figure 4.5.3. Size composition (inches total length) of recreational mutton snapper landings in the Southeast Headboat Survey, 2010-2014.
Source: Southeast Headboat Survey

Figure 4.5.4 provides the South Atlantic mutton snapper length distribution for the commercial sector in 1-inch increments from 2010 through 2014. In the commercial sector, the majority of the mutton snapper are harvested well above any of the minimum size limits being considered under **Alternatives 2** through **5**. In fact, 63% of the lengths are above the largest minimum size (20 inches TL) being considered in the amendment. Therefore, the level of regulatory discards in the commercial fishery as a result of any of the alternatives considered under this action is not expected to change. Biological impacts, therefore, would be neutral for **Alternative 1 (No Action)** and **Alternatives 2-5**. See **Appendix D (BPA)** for more information on bycatch and discards.

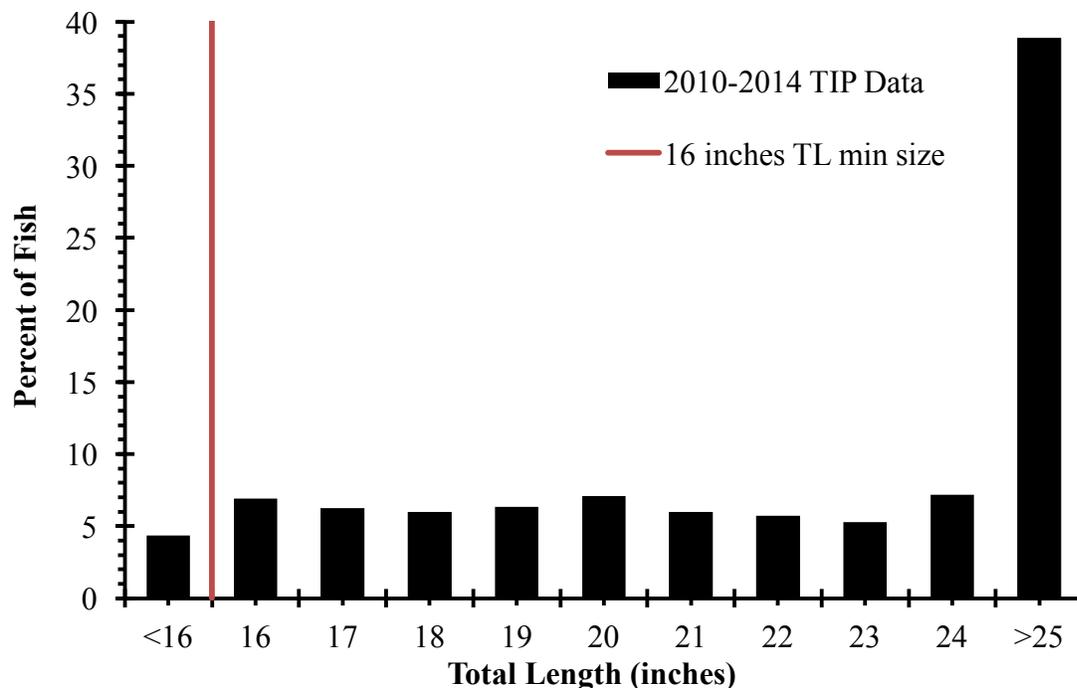


Figure 4.5.4. South Atlantic mutton snapper total length distribution (inches total length) generated from commercial dockside intercepts (TIP data) from 2010 to 2014 (N=1,101 mutton snapper). The red line denotes the current commercial minimum size limit of 16 inches TL. Source: NMFS SERO

Reductions in landings in weight were calculated for minimum size limits at 1-inch intervals between 16-20 inches TL following methodology presented in **Appendix K**. Percent reductions associated with minimum size limits were normalized to a 0% reduction at the commercial status quo minimum size limit of 16 inches total length. Due to concerns about low sample sizes, output was pooled for 2010-2014 data. All of the weights used in the analysis are in pounds whole weight. Release mortality was incorporated into the analysis, and was determined to be 15% following SEDAR 15A Update (2015).

Table 4.5.2. Estimated percent reductions in mutton snapper commercial landings for the minimum size limits being considered in Amendment 41. The reduction was generated with TIP data from 2010-2014 and a sample of 1,101 fish.

Minimum Size Limit (inches TL)	Percent Reduction
16	0
17	1.9
18 (Pref)	3.8
19	6.1
20	9.0

Source: NMFS SERO

The reliability of this analysis is dependent upon the accuracy of the underlying data and input assumptions. This analysis assumes that the commercial harvest of mutton snapper size distribution from 2010-2014 will reflect the size distribution of mutton snapper commercial harvest in the future.

The alternatives and sub-alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types used. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.5.2 Economic Effects

Size limits that result in more spawning and/or higher fecundity would result in more long-term positive economic effects presumably through the availability of increased numbers of fish in the future. However, there could be some direct, short-term, negative economic effects as fewer fish would be available to harvest until the current population grows into the new minimum size and/or the biomass of harvestable fish increases. In the commercial sector, size limits can increase the number of discarded fish and trip costs if a vessel takes longer or more trips to mitigate the reduced landings per trip. This could negatively affect the profitability of a fishing trip and/or the overall annual profitability of a commercial fishing business. In the recreational sector, the initial decrease in fish available for harvest could negatively affect consumer surplus for a fishery. Net operating revenue for charter and head boat trips may be negatively affected as well if overall fishing effort decrease or trips become more costly due to higher search costs. The greater the increase in the minimum size limit from **Alternative 1 (No Action)**, the greater the probability for short-term negative economic effects. However, an increase in the minimum size limit above 16 inches (**Alternative 1 (No Action)**) could also result in greater long-term positive economic effects as long as increased size limits translate into a larger spawning stock biomass and overall biomass increasing above the minimum limit.

Haab et al. (2012) estimated the CS (willingness to pay (WTP) for one additional fish caught and kept) for snappers and groupers in the southeastern U.S. using four separate econometric modeling techniques. It is assumed that snapper is a better proxy for mutton snapper than grouper; however, any CS estimates derived for mutton snapper using “snapper” as a proxy should be viewed as ballpark estimates only. The finite mixture model, which takes into account variation in the preferences of fishermen, had the best prediction rates of the four models. The WTP for an additional snapper (excluding red snapper) estimated by this model was \$12.38 (2015 dollars) with a 95% confidence interval (CI) of \$8.26 to \$17.89. The WTP for an additional snapper from the mixed-logit model was higher at \$30.29 (2015 dollars) with a 95% CI of \$20.64 to \$39.92. Due to the variation in proxy values, both are shown to provide an upper and lower estimate of CS. **Table 4.5.3** shows the expected number of fish landed for the

recreational sector under each alternative along with the decrease in CS using **Alternative 1 (No Action)** as a baseline. The estimate of recreational landings under **Alternative 1 (No Action)** is 111,966 fish (**Table 4.5.1**) that would result in a CS ranging from \$1,386,139 to \$3,391,450 depending on the CS proxy value used (2015 dollars) (Finite Mixture Model: \$12.38 per fish or Mixed Logit Model: \$30.29 per fish). Depending on the alternative that is examined and the CS estimate that is used, the potential decrease in CS ranges from \$0 to approximately \$2.05 million (2015 dollars). For **Preferred Alternative 3**, the expected range of reductions in CS is approximately \$760,000 to \$1.86 million (2015 dollars).

Alternative 1 (No Action) affords the lowest negative, direct, short-term economic effect compared to **Alternatives 2** through **5**. However, **Alternative 1 (No Action)** could result in a more compressed stock size and presumably lower fecundity in the future, leading to fewer fish available to harvest when compared to the other alternatives. The economic benefit of establishing a larger minimum size limit would presumably be an increased stock size that may allow for future economic benefits associated with increased harvest and recreational opportunities.

Table 4.5.3. Estimated change in consumer surplus (2015 \$) for the recreational mutton snapper fishery in the first year of implementation.

	Size Limit	Estimated Recreational Landings (number of fish)	Estimated Reduction in Landings (number of fish)	Decrease in Consumer Surplus(Finite Mixture Model: \$12.38 per fish)	Decrease in Consumer Surplus (Mixed Logit Model: \$30.29 per fish)
Alternative 1 (No Action)	16" TL	111,966	0	\$0	\$0
Alternative 2	17" TL	56,284	55,682	\$689,343	\$1,686,608
Preferred Alternative 3	18" TL	50,597	61,369	\$759,748	\$1,858,867
Alternative 4	19" TL	46,907	65,059	\$805,430	\$1,970,637
Alternative 5	20" TL	44,173	67,793	\$839,277	\$2,053,450

Increasing the size limit would also affect commercial mutton snapper landings. **Table 4.5.4** shows the expected change in revenue that fishermen receive for mutton snapper based on observed landings in the commercial fishery (**Table 3.1.10**) and projected reductions found in **Table 4.5.2**. Under the alternatives, the expected range of reductions in the ex-vessel value of commercial mutton snapper landings is \$0 to \$15,596 (2015 dollars). The expected decrease in ex-vessel value under **Preferred Alternative 3** is \$6,585 (2015 dollars).

Table 4.5.4. Estimated change in the ex-vessel value (2015 dollars) of commercial mutton snapper landings in the first year of implementation.

Sub-alternative	Size Limit	Estimated Reduction in Ex-vessel Value
Alternative 1	16" TL	0
Alternative 2	17" TL	\$3,292
Preferred Alternative 3	18" TL	\$6,585
Alternative 4	19" TL	\$10,570
Alternative 5	20" TL	\$15,595

When examining the estimated direct, short-term negative economic effects, **Alternative 1 (No Action)** has the lowest anticipated negative economic effect followed by **Alternative 2**, **Preferred Alternative 3**, **Alternative 4**, and **Alternative 5**. However, **Alternative 1 (No Action)** could result in a more compressed stock size and presumably lower fecundity in the future, leading to fewer fish available to harvest when compared to the other alternatives. The economic benefit of establishing a larger minimum size limit would presumably be an increased stock size that may allow for future economic benefits associated with increased harvest and recreational opportunities.

4.5.3 Social Effects

Some social effects of minimum size limits would be associated with the positive and negative biological effects of minimum size limits on the mutton snapper (**Section 4.5.1**). Positive effects of allowing only fish of a certain size that are caught in the South Atlantic exclusive economic zone to be landed could help maintain sustainability of harvest and the health of the mutton snapper stock, which would be beneficial to recreational and commercial fishermen in the long term. Negative effects of the potential increase in discard mortality due to higher minimum size limit could affect the stock and in turn, commercial and recreational fishing opportunities.

Recreational landings are expected to decrease as the minimum size limit increases (**Table 4.5.1**), which would likely result in negative short-term effects on fishermen targeting mutton snapper. If fishermen are not able to meet the bag limit because of the minimum size limit, this may reduce trip satisfaction for both private recreational trips and for-hire trips. The largest minimum size limit (**Alternative 5**) would be expected to have the highest level of short-term negative effects on the recreational sector and associated businesses, followed by **Alternative 4**, **Preferred Alternative 3**, and **Alternative 2**. Although **Alternative 1 (No Action)** would have

less negative effect on trip satisfaction, any minimum size limit may restrict the number of fish that can be landed.

There are also long-term benefits of reducing the rate of harvest to extend the fishing season and to contribute to long-term biological benefits when the minimum size limit is increased, as discussed in **Section 4.5.1**.

4.5.4 Administrative Effects

Beneficial administrative effects would be expected from **Alternative 2, Preferred Alternative 3, Alternative 4, and Alternative 5** when compared with **Alternative 1 (No Action)**. Alternatives that specify a consistent minimum size limit in state and federal waters throughout the South Atlantic Council's jurisdiction would help the public avoid confusion with regulations and aid law enforcement. Administrative impacts on the agency associated with the action alternatives would be incurred by rulemaking, outreach, education and enforcement. Because there is a minimum size limit already in place for mutton snapper in the South Atlantic Region under **Alternative 1 (No Action)**, changing the minimum size limit under **Alternatives 2 through 5** would not be unusually burdensome.

4.6 Action 6. Designate spawning months during which certain commercial and recreational management measures for mutton snapper should apply in the South Atlantic Region

4.6.1 Biological Effects

There is no “designated” spawning season for mutton snapper by the South Atlantic Council. However, under **Alternative 1 (No Action)**, May and June were recognized as the spawning months for mutton snapper throughout the South Atlantic Council’s area of jurisdiction for regulatory purposes in the commercial sector. Amendment 4 to the Snapper Grouper FMP (SAFMC 1991) designated May and June as the months during which stricter commercial regulations would be implemented to prevent overharvesting of spawning aggregations. No management measures were put in place to constrain recreational harvest during those months, however. Specifying the months during which specific management measures are to apply would not in itself result in any biological effects. However, alternatives that better align the timeframe of regulations with the biology of the species would indirectly result in beneficial biological effects.

Mutton snapper are known to form aggregations when they spawn (Figuerola et al. 1997). Burton et al. (2005 and references therein) indicate that mutton snapper spawning occurs from May through July at Riley’s Hump off Florida and peaks in June, as indicated by gonadosomatic indices (M. Burton, unpubl. data). Fish begin to aggregate for spawning around the full moon (Burton et al 2005). Individuals have been observed in spawning condition in the U.S. Caribbean from February through July (Erdman 1976). Some spawning occurs during February to June off Puerto Rico, but spawning peaks during the week following the full moon in April and May. Spawning aggregations are known to occur north of St. Thomas, USVI, and south of St. Croix, USVI, in March, April, and May (Rielinger 1999).

Graham et al. (2008) report evidence of a significant decline in catch-per-unit effort, mean landings and inter-annual median lengths of mutton snapper in Belize, due to overexploitation at a spawning aggregation in Gladden Spit. The authors suggest that “a precautionary approach to spawning aggregation management is warranted that provides full protection from fishing to enhance population persistence. The findings also highlight the need for substantially greater enforcement and long-term fisheries monitoring under a comprehensive regional management strategy.”

*Alternatives**

1 (No Action). Seasonal harvest limitations apply to the commercial sector during mutton snapper spawning in May and June each year. There are no comparable seasonal restrictions during May and June that apply to the recreational sector.

2. For regulatory purposes, designate the following as “spawning months.” The remainder of the year would be the “regular season.”

Sub-alternative 2a. April-June

Sub-alternative 2b. April-July

Sub-alternative 2c. May-July

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

In general, **Preferred Alternative 2** (and its sub-alternatives) would result in positive indirect biological effects if greater restrictions are applied to the “spawning months.” Of these, **Sub-alternative 2b** would indirectly provide the greatest biological benefit to mutton snapper in that it encompasses the longest amount of time (4 months) and has the greatest potential of capturing the bulk of mutton snapper spawning activity in the South Atlantic Council’s area of jurisdiction. **Preferred Sub-alternative 2a** and **Sub-alternative 2b** could result in the implementation of regulations one month earlier than under **Alternative 1 (No Action)** and **Sub-alternative 2c**, possibly imparting some indirect biological benefit in light of changing climate and its observed effect on species’ reproductive cycles. Establishing the annual timeframe during which potentially stricter management measures would apply is not expected to, in itself, affect bycatch or regulatory discards. In that respect, therefore, all of the alternatives considered under this action, including **Alternative 1 (No Action)**, would result in neutral biological effects.

The alternatives and sub-alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types used. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.6.2 Economic Effects

Currently, during May through June, the commercial sector is restricted to 10 mutton snapper per person per day or 10 per person per trip but regulations do not change for the recreational sector during this time period. Without a change in management measures during the designated “spawning months” there would be no expected direct economic effects to the recreational sector. If stricter measures were put in place, then both the recreational and commercial sector may experience short-term negative economic effects. The recreational sector may see a decrease in consumer surplus on trips targeting or landing mutton snapper during the designated spawning months if measures are put in place that restrict the harvest of mutton snapper. Net operating revenue of charter and head boats that target mutton snapper may also be negatively affected if customers take fewer trips during the designated spawning months due to increased restrictions. Commercial fishing operations could potentially see an expansion of the current spawning season restrictions that limits the number of mutton snapper that can be landed per trip, thereby possibly decreasing the profitability of these commercial trips. Presumably these short-term negative economic effects may be offset if the biomass of mutton snapper improves as a result of additional protection during the spawning period. Since the length of time during which stricter measures could potentially be placed on mutton snapper harvest is the same under **Preferred Sub-alternative 2a** and **Sub-alternative 2c**, the anticipated short-term negative economic effects are similar. Encompassing the longest time period, **Sub-alternative 2b** has the greatest potential for short-term economic effects. All of the sub-alternatives of **Preferred Alternative 2** are expected to have greater short-term negative effects than **Alternative 1 (No**

Action), since they will all extend the time period in which spawning season restrictions are in place.

4.6.3 Social Effects

The effects on commercial and recreational fishermen due to an establishment of a designated “season” during the year with more restrictive measures would be associated with the biological benefits of the season, and the negative social and economic effects of restricted access. Having a specified period each year with associated management measures to reduce harvest during spawning for mutton snapper (**Preferred Alternative 2**) would be expected to be beneficial to the stock. This could improve fishing opportunities in the long term by increasing spawning activity and the number of mutton snapper, but only if management measures are in place during the designated time of year.

There is no “designated” spawning season for mutton snapper by the South Atlantic Council. However, under **Alternative 1 (No Action)** May and June were recognized as the spawning months for mutton snapper throughout the South Atlantic Council’s area of jurisdiction for regulatory purposes in the commercial sector but not the recreational sector. However, assuming that there are associated management measures to reduce harvest during the designated periods, the long-term benefits to the mutton snapper stock would be lower than under **Preferred Alternative 2**. The effects of the designated time (**Sub-alternatives 2a (Preferred)-2c**) would depend on how the specified season lines up with actual spawning activity and how the season lines up with times of year with higher fishing activity. The longer designated period in **Sub-alternative 2b** would likely have more negative effects on recreational fishermen than three-month periods under **Preferred Sub-alternative 2a** and **Sub-alternative 2c**, if there are management measures in place to reduce harvest during the designated period.

4.6.4 Administrative Effects

The administrative effects of **Sub-alternatives 2a (Preferred), 2b, and 2c** would add to the administrative burden that already exists under **Alternative 1 (No Action)**. Designating a spawning season under **Sub-alternatives 2a (Preferred), 2b, and 2c**, that would be different from the other months of a calendar year (regular season) could be confusing to the public and add to the administrative burden in the form of cost, time, and law enforcement efforts compared to **Alternative 1 (No Action)**. Additionally, the public would have to be informed and educated on additional restrictions on harvest.

4.7 Action 7. Modify mutton snapper recreational bag limit in the South Atlantic Region

4.7.1 Biological Effects

Table 4.7.1 below shows landings of mutton snapper by recreational wave from 2010 through 2014. The peak of mutton snapper recreational landings occurred during the May-June spawning season (Wave 3) in the South Atlantic during 2010 through 2013. In 2014, however, landings were highest in Wave 6 (November/December) and Wave 1 (January/February). **Figure 4.7.1** shows the distribution of mutton snapper catch-per-angler for the private and for-hire modes (based on the Marine Recreational Information Program (MRIP) survey and Southeast Headboat Survey, respectively) of mutton snapper for various time periods. From 2010 through 2014, most anglers caught three or fewer mutton snapper.

*Alternatives**

1 (No Action). Mutton snapper is part of the aggregate 10 snapper bag limit in the South Atlantic that applies throughout the fishing year.

2. Retain mutton snapper within the 10-snapper aggregate bag limit, but specify a bag limit for mutton snapper during the “regular season” (i.e., non-spawning months).

2a. 4 fish/person/day

2b. 5 fish/person/day

2c. 10 fish/person/day

3. Retain mutton snapper within the 10-snapper aggregate bag limit, but specify bag/vessel limits for mutton snapper during the “spawning months”

3a. 2 fish/person/day

3b. 3 fish/person/day

3c. 10 fish/vessel/day

3d. 12 fish/vessel/day

3e. No retention

4. Retain mutton snapper within the 10-snapper aggregate bag limit, but specify bag limits for mutton snapper within the aggregate bag limit year round.

4a. 2 fish/person/day

4b. 3 fish/person/day

4c. 5 fish/person/day

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

Table 4.7.1. South Atlantic recreational (private, charter, and headboat) mutton snapper landings (numbers of fish) by wave, 2010-2014.

Year	1 (J/F)	2 (M/A)	3 (M/J)	4 (J/A)	5 (S/O)	6 (N/D)	Total
2010	21,582	9,475	35,224	36,609	16,583	10,776	130,249
2011	12,253	9,758	20,427	4,020	7,113	6,579	60,151
2012	9,695	23,620	20,847	13,597	4,988	13,362	86,108
2013	12,009	8,415	38,296	29,946	24,702	12,873	126,241
2014	36,850	9,523	31,024	25,715	12,819	41,570	157,501
Mean	18,478	12,158	29,164	21,977	13,241	17,032	112,050

Source: http://sero.nmfs.noaa.gov/sustainable_fisheries/acl_monitoring/index.html.

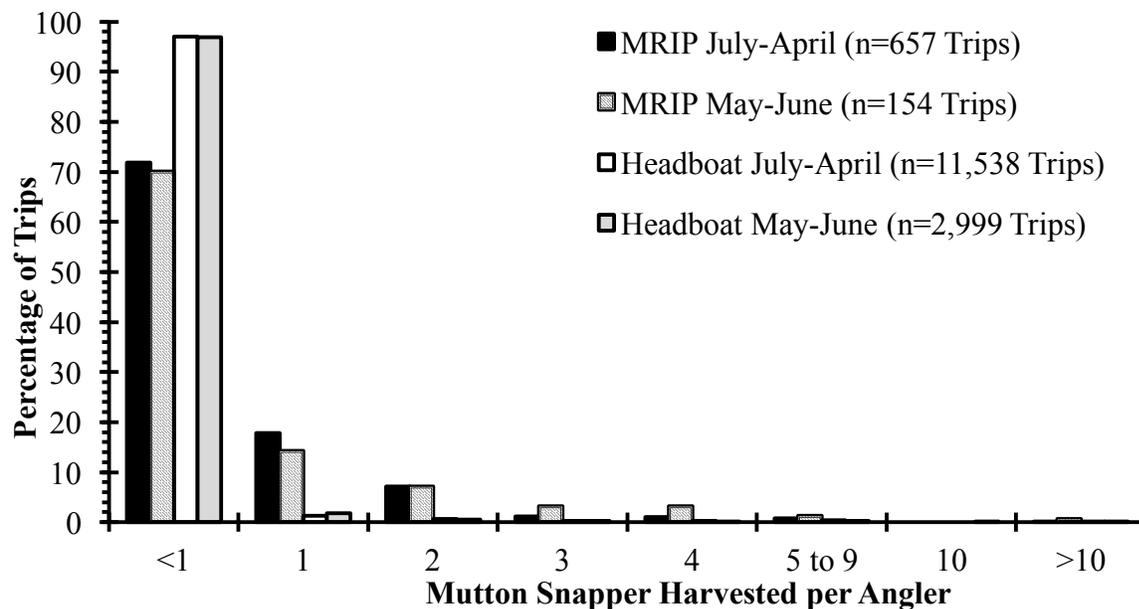


Figure 4.7.1. Distribution of South Atlantic mutton snapper landed per angler by season from the two recreational datasets (MRIP and Headboat) from 2010 through 2014.

In general, constraining recreational harvest by means of bag limits results in neutral biological effects because the ACL limits overall harvest to a level that is sustainable over the long-term. However, bag limits can be beneficial in managing harvest of species whose biology makes them particularly vulnerable to fishing mortality during part of their life cycle, such as when they are reproducing. As such, **Alternative 3** and its sub-alternatives would provide greater biological benefits over **Alternative 1 (No Action)**, **Alternative 2**, and **Preferred Alternative 4**. Among the **Alternative 3** sub-alternatives, **Sub-alternative 3e**, which would allow for no retention of mutton snapper, would provide the greatest biological benefit since fish would not be subject to fishing mortality while they are in spawning condition. Positive biological effects would be expected from **Sub-alternatives 3a, 3b, 3c, and 3d**, in that order, as these sub-alternatives would constrain recreational harvest during the spawning months. In terms of regulatory discards, **Sub-alternative 3e** has the potential to result in higher levels than the other sub-alternatives under **Alternative 3** as no retention would be allowed during the spawning months, a time when recreational landings have been highest (**Table 4.7.1**).

Table 4.7.2 presents projected recreational landings under the various “regular season” (**Alternative 2**) and “spawning months” (**Alternative 3**) bag limit combinations for the preferred minimum size limit (18 inches TL) and preferred “spawning months” of April through June (**Action 6**). As expected, landings would be lowest under a scenario including no retention of mutton snapper during the spawning months (**Sub-alternative 3e**). Landings would be highest under “per person” bag limits during and outside of the “spawning months.” Overall however, the differences in projected landings are not very large among the **Alternative 3** sub-alternatives, and extremely small among the **Alternative 2** sub-alternatives. This indicates that changes to the recreational bag limit would have very little effect in constraining recreational harvest.

Table 4.7.2. Projected mutton snapper recreational landings (in numbers of fish) under various bag limits at the preferred **18-inch minimum size limit** and an **April-June** spawning season. “pp” signifies “per person” and “pv” signifies “per vessel.”

Bag limit during spawning season	Bag limit outside of spawning season		
	2a - 4 pp	2b - 5 pp	2c - 10 pp
3a - 2 pp	50,502	50,502	50,503
3b - 3pp	50,561	50,568	50,571
3c - 10 pv	49,548	49,555	49,558
3d - 12 pv	49,653	49,660	49,663
3e - Closed	47,904	47,911	47,913

Preferred Alternative 4 and its sub-alternatives propose specifying a mutton snapper bag limit within the 10-snapper aggregate year-round. **Table 4.7.3** shows expected recreational landings under the **Preferred Alternative 4** sub-alternatives for the various minimum size limits considered under **Action 5**. As the majority of recreational anglers are catching less than three mutton snapper per day (**Figure 4.7.1**), **Preferred Sub-alternative 4c** would have little effect in constraining recreational harvest on its own and essentially be the same as **Alternative 1 (No Action)**. Similarly, the level of discards would not be expected to change from status quo. However, as evident in **Table 4.7.3**, imposing a minimum size limit above the status quo of 16 inches TL is expected to reduce recreational harvest by about 50% (also see **Table 4.5.1**). **Sub-alternatives 4a** and **4b** would impart a similar level of biological benefit to the mutton snapper stock as **Sub-alternatives 3a** and **3b** since they would also lower the level of fishing mortality during the spawning season.

Table 4.7.3. Projected recreational landings of mutton snapper (numbers of fish) for sub-alternatives under **Preferred Alternative 4** (year round bag limits) at the various minimum size limits considered under **Action 5** (preferred indicated in bold)

Bag limits	Minimum size limit (inches TL)				
	16 (current)	17	18	19	20
4a - 2pp	107,968	54,960	50,399	46,751	43,394
4b - 3pp	110,840	55,726	50,539	46,872	43,756
4c (Pref) - 5pp	111,796	56,121	50,594	46,905	44,016

The alternatives and sub-alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types used. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.7.2 Economic Effects

Currently, in the 10-fish snapper aggregate bag limit, up to 10 snappers landed could be mutton snapper. Generally, angler satisfaction increases with the number of fish that can be harvested and the size of the fish. The smaller the bag limit the greater the probability that the satisfaction from an angler trip could be affected. As shown in **Figure 4.7.1**, anglers tend to land three or less mutton snapper on a single trip. Therefore, setting the bag limit between 4 and 10 fish per person per day is expected to have minimal negative economic effects, while setting the bag limit at 1, 2, or 3 fish per person per day can be expected to have noticeably larger negative economic effects. During the regular season, **Sub-alternatives 2a** and **2b** would be more restrictive than the current bag limit of up to 10 mutton snapper per person/day within the snapper aggregate bag limit, therefore some negative economic impacts may be expected. **Sub-alternative 2c** allows the harvest of up to 10 mutton snapper per person/day, which is equivalent to the current bag limit; therefore, no economic effects are expected from this sub-alternative. Vessel limits in **Sub-alternative 3c** and **Sub-alternative 3d** would affect recreational participants only on trips where the vessel limit is more restrictive than the bag limit.

Table 4.7.4 shows the estimated decrease in recreational CS that may occur from projected mutton snapper landings under various bag and size limits in **Table 4.7.3** in comparison to a baseline projected landings of mutton snapper for the recreational sector and the associated CS estimates for these landings. Using projected baseline landings of 111,966 fish (**Table 4.5.1**) provides a lower bound total CS estimate of \$1,386,139 and an upper bound total CS estimate of \$3,391,450 (2015 dollars). The two estimates of marginal CS used in this analysis are \$12.38 per fish for a snapper derived from the finite mixture model and \$30.29 per fish for a snapper derived from the mixed-logit snapper model (2015 dollars) (See **Section 4.3.2**). The sub-alternatives of **Preferred Alternative 4** for **Action 7** would establish a recreational bag limit that would be more restrictive than the current 10 fish per person per day aggregate snapper limit (**Alternative 1 (No Action)**). These sub-alternatives are paired with minimum size limit options from **Action 5** to provide total CS estimates for the recreational sector (**Table 4.7.4**). In general, **Preferred Sub-Alternative 4c** has the smallest estimated short-term decrease in landings and CS followed by **Sub-alternative 4b**, with **Sub-alternative 4a** having the largest estimated short-term decrease in landings and CS. The estimated reductions in CS that are expected to occur from **Preferred Sub-alternative 4c** when combined with **Preferred Alternative 3** from **Action 5** range from \$759,785 to \$1,858,958 (2015 dollars). Since a 16-inch minimum size limit is the status quo, the reductions in recreational mutton snapper landings and resulting changes in CS solely due the bag limit reductions of **Sub-alternative 4a** through **Preferred Sub-alternative 4c** are represented in **Table 4.7.4** under the 16-inch size limit. Thus, the estimated reductions in CS that are expected to occur solely from a change in the bag limit in **Preferred Sub-alternative 4c** range from \$2,105 to \$5,149 (2015 dollars).

Table 4.7.4. Estimated short-term decrease in recreational landings and consumer surplus (2015 dollars) for the sub-alternatives of **Preferred Alternative 4** of **Action 7** and minimum size limit options in **Action 5**.

Size Limit	Decrease in Landings (Numbers)	Decrease in Recreational CS - Snapper (Finite Mixture Model: \$12.38/fish.)	Decrease in Recreational CS - Snapper (Mixed Logit Model: \$30.29/fish)
Sub-alt 4a- 2 fish/person/day			
16"	3,998	\$49,495	\$121,099
17"	57,006	\$705,734	\$1,726,712
18"	61,567	\$762,199	\$1,864,864
19"	65,215	\$807,362	\$1,975,362
20"	68,572	\$848,921	\$2,077,046
Sub-alt 4b: 3 fish/person/day			
16"	1,126	\$13,940	\$34,107
17"	56,240	\$696,251	\$1,703,510
18"	61,427	\$760,466	\$1,860,624
19"	65,094	\$805,864	\$1,971,697
20"	68,210	\$844,440	\$2,066,081
Preferred Sub-alt 4c: 5 fish/person/day			
16"	170	\$2,105	\$5,149
17"	55,845	\$691,361	\$1,691,545
18"	61,372	\$759,785	\$1,858,958
19"	65,061	\$805,455	\$1,970,698
20"	67,950	\$841,221	\$2,058,206

4.7.3 Social Effects

In general, the social effects of modifying the recreational harvest limits would be associated with the biological costs of each alternative (see **Section 4.7.1**), as well as the effects on current recreational fishing opportunities. While **Alternatives 2-4 (Preferred)** could restrict recreational fishing opportunities for mutton snapper, especially under the spawning season limits in **Alternative 3**, the harvest limits would also be expected to contribute to long-term benefits to the stock and for future recreational opportunities.

Different levels of recreational fishing opportunities under each alternative could affect recreational anglers and for-hire businesses targeting mutton snapper. The social effects of bag limits and vessel limits can be associated with how many and at what times of year the recreational catch may be retained. Additionally, any long-term negative biological effects on the stock due to recreational landings from higher recreational harvest limits, or dead discards due to lower harvest limits, would also likely result in negative effects on recreational fishing opportunities in future years.

In general, social benefits from improved recreational fishing opportunities would result from harvest limits that has the largest portion of the year open to recreational harvest, with the highest number of fish per person, as long as the recreational ACL is not exceeded. **Alternative 1 (No Action)** would be the most beneficial to recreational fishermen in the short-term but could detract from measures to protect the stock during spawning activity. The limits during the “regular season” [which depends on the potential spawning season designated in **Action 6**] under **Alternative 2** could have negative effects on opportunities to retain mutton snapper, with minimal or no effects under **Sub-alternative 2c**, and fewer potential effects under **Sub-alternative 2b**, followed by **Sub-alternative 2a**.

The potential vessel limits during the potential spawning season in **Alternative 3** could have negative effects on recreational fishing opportunities, specifically for headboat businesses with higher numbers of people on board, but would be expected to have long-term benefits to the stock. The most restrictive measure (no retention) under **Sub-alternative 3e** would be the most likely to have short-term negative effects on recreational fishermen and for-hire businesses, but would affect all levels of recreational participation (solo angler to headboats) at equal levels. The lower vessel limits would have more negative effects for vessels with more people on board, so (after no retention under **Sub-alternative 3e**) **Sub-alternative 3c** would likely have the most negative effects on recreational fishermen, followed by **Sub-alternative 3d**, **Sub-alternative 3a**, and **Sub-alternative 3b**.

Setting the recreational harvest limits year-round (**Preferred Alternative 4**) would reduce complexity of management measures, which would likely improve compliance. Negative short-term effects due to restrictions on retention of mutton snapper would increase with lower bag limits, so that the most negative effects would come from **Sub-alternative 4a**, followed by **Sub-alternative 4b**, and **Preferred Sub-alternative 4c**.

4.7.4 Administrative Effects

Under **Alternative 1 (No Action)**, mutton snapper would remain part of the aggregate snapper bag limit. **Alternatives 2, 3, and 4 (Preferred)** (including their sub-alternatives) would add to the administrative burden in the form of cost, time, law enforcement efforts to react to the changes, when compared with **Alternative 1 (No Action)**. However, since a bag limit is already in place, the effects to the administrative environment are not expected to be significant. Changing the bag limit may require more outreach to notify the public and more law enforcement efforts to enforce the regulations. **Alternatives 2 and 3** (including their sub-alternatives) would be the most burdensome since there would be a different bag limit during the “regular” season versus “spawning months”; followed by **Preferred Alternative 4** (including the sub-alternatives) which would specify bag limits within the aggregate bag limit year round, and **Alternative 1 (No Action)**.

4.8 Action 8. Modify mutton snapper commercial trip limit in the South Atlantic Region

4.8.1 Biological Effects

Table 4.8.1 shows commercial landings of mutton snapper by gear type from 2004-2014 in the South Atlantic. The predominant gear for harvesting mutton snapper in South Atlantic waters has been vertical line (Table 4.8.1). Trap gear was prohibited for snapper grouper species (except pots for black sea bass) in the South Atlantic in 1992, and was phased out in the Gulf of Mexico for reef fish in 2007. However, trap landings of mutton snapper are still reported in the South Atlantic and are likely bycatch from the spiny lobster fishery (Matthews et al. 2005).

Commercial landings of mutton snapper in the South Atlantic region are highest during the May-June peak spawning period (Figure 4.8.1) despite the current restriction on harvest. Overall, South Atlantic landings of mutton snapper were highest in 2004, decreased through 2011, and then had an overall increase through 2014 (Figure 4.8.2).

Alternatives*

1 (No Action). During May and June, each year, the possession of mutton snapper in or from the exclusive economic zone on board a vessel that has a commercial permit for South Atlantic snapper-grouper is limited to 10 per person per day or 10 per person per trip, whichever is more restrictive. There is no possession or trip limit for the commercial sector in the South Atlantic from January through April and July through December.

2. Establish a commercial trip limit for mutton snapper during the “regular season” (i.e., non-spawning months) in the South Atlantic.

2a. 300 pounds

2b. 400 pounds

2c. 500 pounds

3. Specify a commercial trip limit for mutton snapper during the “spawning months” in the South Atlantic.

3a. 2 fish/person/day or trip

3b. 3 fish/person/day or trip

3c. 10 fish/vessel/day

3d. 12 fish/vessel/day

3e. No retention

3f. 5 fish/person/day or trip

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

Table 4.8.1. Commercial landings of mutton snapper by gear in the South Atlantic for 2004-2013. Landings are reported in pounds whole weight. Confidential landings are labeled as “NA.”

Year	Vertical	Traps	Diving	Other
2004	98,513	6,225	3,805	709
2005	81,551	2,662	5,023	2,436
2006	59,071	3,427	2,959	608
2007	59,955	5,918	3,770	1,343
2008	61,836	2,296	3,052	829
2009	69,088	1,873	3,429	915
2010	66,464	4,048	2,759	822
2011	54,997	7,111	3,599	372
2012	66,912	3,875	6,156	NA
2013	60,586	3,321	8,865	NA
2014	83,811	3,410	3,701	251

Source: Commercial ACL dataset. South Atlantic vertical line includes: hook-and-line by hand, hook-and-line power assisted (bandit) and hook-and-line troll. “Other” includes landings from the following gear types: gill nets, lift nets, seine nets, and unclassified gear.

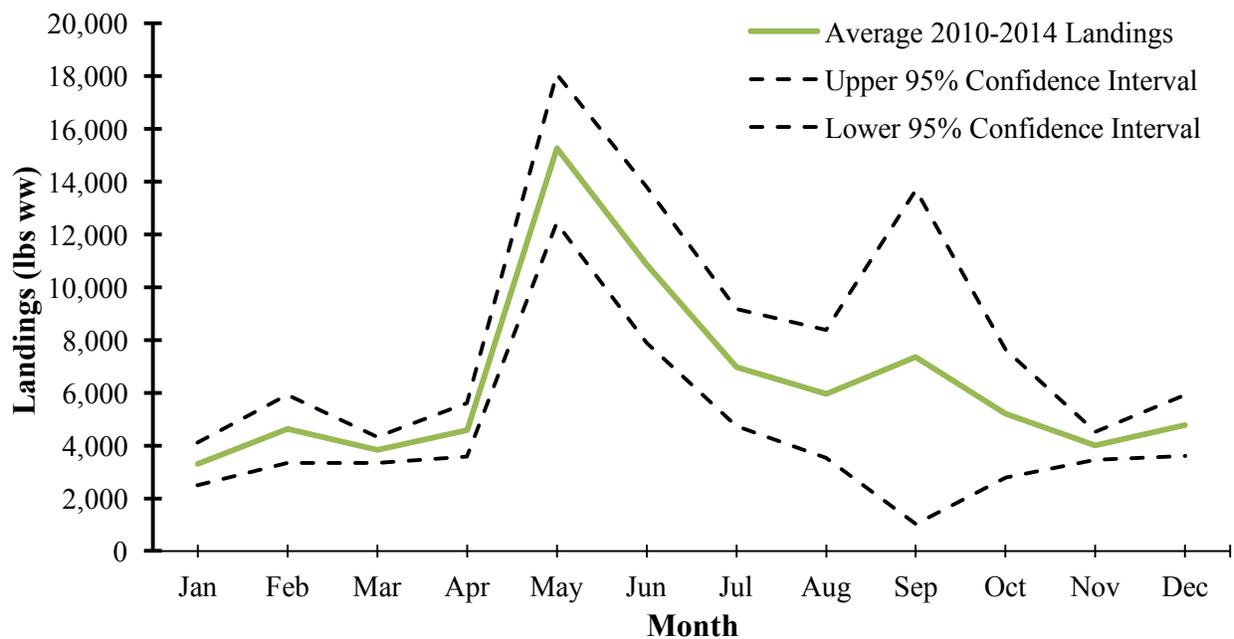


Figure 4.8.1. Average annual South Atlantic commercial mutton snapper landings by month from 2010-2014 and 95% confidence intervals.

Source: Commercial ACL dataset.

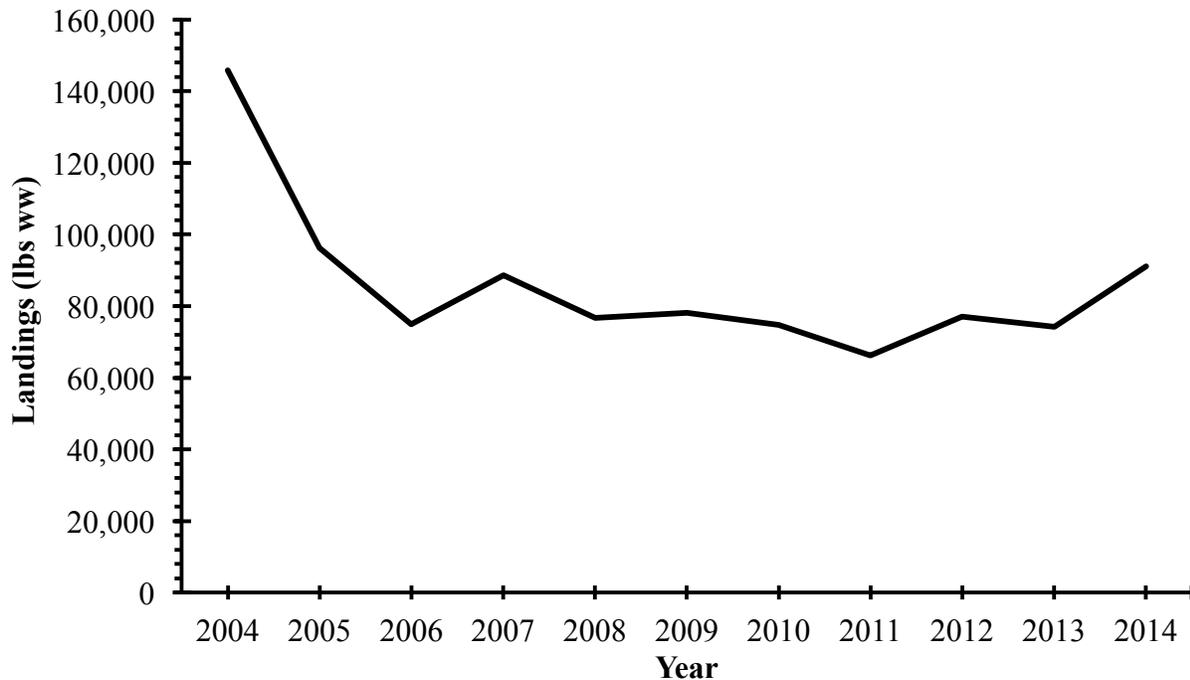


Figure 4.8.2. South Atlantic annual commercial landings (lbs ww) of mutton snapper. Source: Commercial ACL dataset.

Commercial logbook data (accessed September 3, 2015) were explored to determine trip-level harvest of mutton snapper. The most recent years of complete data (2012-2014) indicated 4,551 trips in the South Atlantic harvested mutton snapper.

Currently, restrictions on the commercial harvest of mutton snapper in the South Atlantic only apply to May-June when commercial harvest is restricted to 10 mutton snapper per person per day or 10 per person per trip, whichever is more restrictive. South Atlantic commercial trips that harvested mutton snapper during May-June were compared to those that took place outside those months (**Figure 4.8.3**). The mutton snapper landed per trip during May-June was relatively similar when compared to the rest of the year (July through April) (**Figure 4.8.3**). However, the number of trips per month was higher during May and June than during the rest of the year.

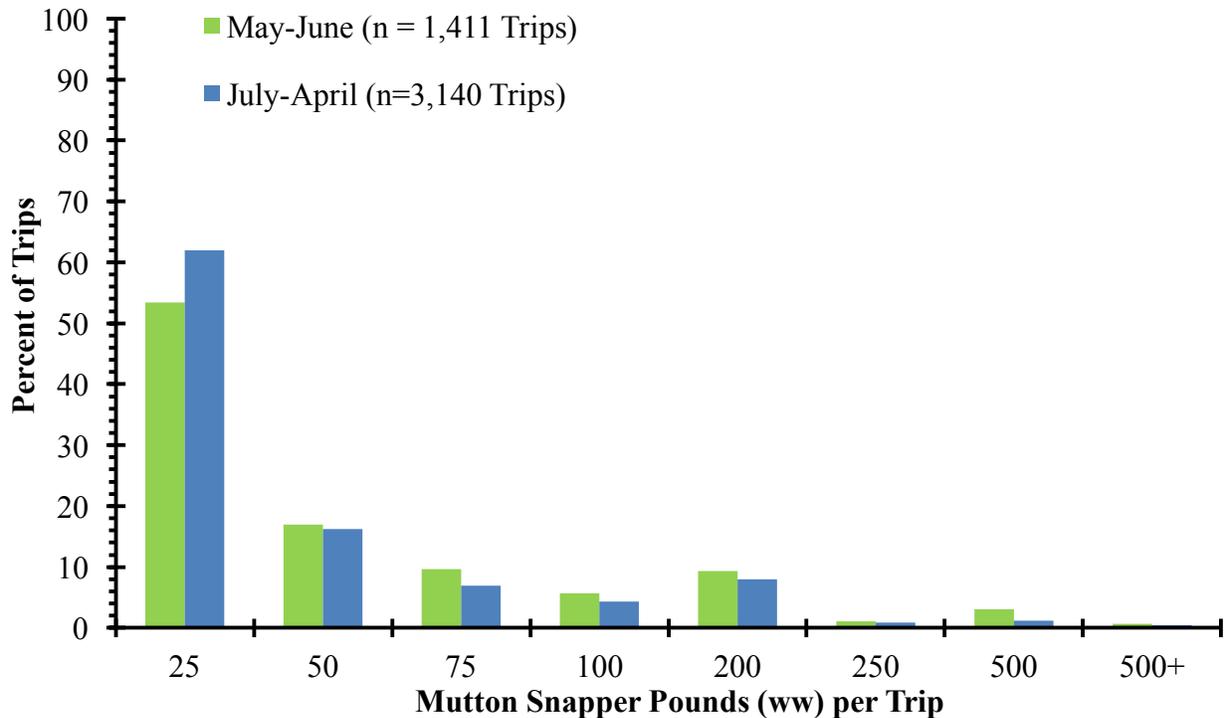


Figure 4.8.3. Distribution of mutton snapper harvested per trip (lbs ww) in the South Atlantic region from the commercial logbook dataset from 2012 to 2014. Commercial restrictions only apply to the commercial sector during May-June.

Preferred Alternative 2 and its sub-alternatives propose implementing a trip limit (defined in pounds whole weight) during the “regular season.” Based on **Preferred Sub-alternative 2a** under **Action 6**, the “regular season” would extend from July through March. Commercial logbook data were analyzed by imposing the **Preferred Alternative 2** proposed trip limits only during the “regular season.” Landings during the “spawning months” (April-June under **Preferred Sub-alternative 2a**, **Action 6**) were not modified. Predicted percent reductions in commercial landings are shown in **Table 4.8.2**. A commercial trip limit of 300 lbs ww (**Sub-alternative 2a**) outside of the designated spawning months (April through June according to **Preferred Sub-alternative 2a**, **Action 6**) is expected to result in a 6% decrease in commercial harvest of mutton snapper. Estimated percent reductions in commercial harvest as a result of the proposed trip limits under **Sub-alternative 2b** (400 lbs ww) and **Preferred Sub-alternative 2c** (500 lbs ww), are 4.5% and 3.7%, respectively.

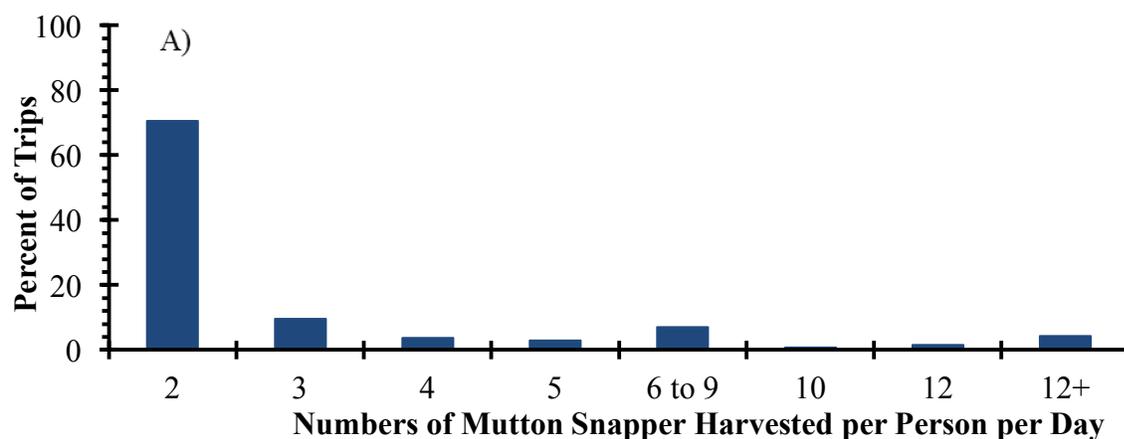
Table 4.8.2. Percent decreases in commercial landings for trip limits proposed under **Preferred Alternative 2** of **Action 8**. Preferred indicated in bold.

Regular Season	Trip Limit		
	300 lbs ww	400 lbs ww	500 lbs ww
July - April	-6.0%	-4.6%	-3.7%
July - March	-5.9%	-4.5%	-3.7%
August - March	-4.1%	-3.0%	-2.3%
August - April	-4.2%	-3.0%	-2.3%

Source: NMFS SERO.

NOTE: Estimates are from commercial logbook data from 2012 to 2014 and percent reductions were calculated for imposing a trip limit during the 'regular season'.

The commercial logbook data provide landings in pounds; however, the current South Atlantic mutton snapper commercial harvest restriction during May-June is specified in numbers of fish. As such, the commercial sector is restricted to 10 mutton snapper per person per day during May and June, or 10 per person per trip, whichever is more restrictive. **Preferred Alternative 3** of **Action 8** proposes trip limits for the commercial sector in numbers of fish during the “spawning months” designated under **Action 6**. Landings in pounds were converted to numbers of fish by dividing the harvest in pounds by the mutton snapper average weight. Average weight was determined to be 7.68 lbs ww in the commercial sector in the recent assessment (SEDAR 15A Update 2015). **Figure 4.8.4** shows the distribution of numbers of mutton snapper harvested per person per day (A) and per vessel per day (B) during May-June from 2012 through 2014. As mentioned previously, **Alternative 1 (No Action)** specifies a commercial trip limit of 10 fish per person per day or 10 fish per person per trip, whichever is more restrictive. There is the potential, therefore, for vessels to intentionally carry additional people on commercial trips during May and June to maximize harvest of mutton snapper. **Figure 4.8.4 (A)** shows that 5.8% of the trips that took place during May and June from 2012 through 2014 exceed the current 10 fish per person per day limit.



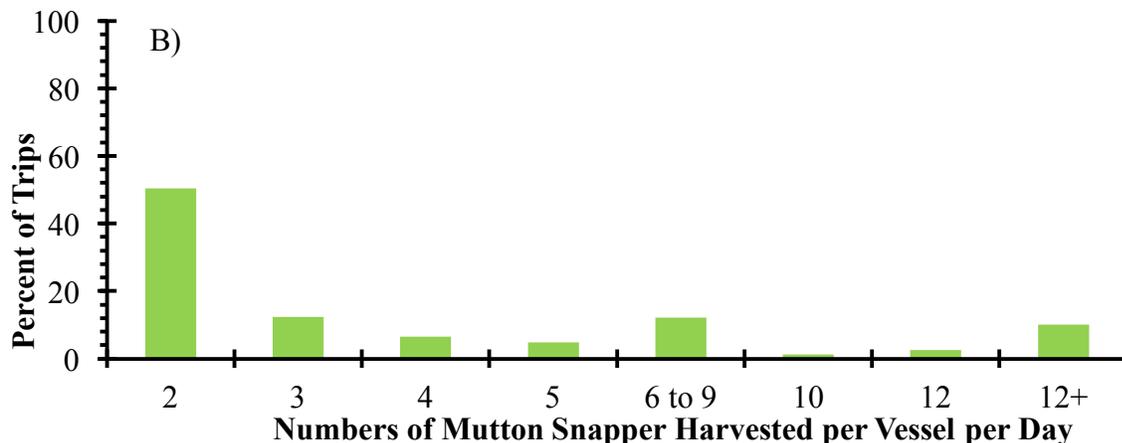


Figure 4.8.4. Distribution of the numbers of mutton snapper harvested per person per day (A) and per vessel per day (B) in the South Atlantic region during May and June. Data are from the commercial logbook dataset from 2012 through 2014 (n = 1,411 trips).

The analysis for **Preferred Alternative 3** examines trip limits in numbers of fish during the “spawning months” as defined under **Action 6**. Trips outside the “spawning months” were not analyzed and/or modified. Under the preferred alternative to designate April through June as the spawning months for regulatory purposes (**Preferred Sub-alternative 2a, Action 6**) and under the preferred commercial possession limit of 5 fish per person per day (**Preferred Sub-alternative 3f**), commercial harvest of mutton snapper is expected to decrease by 13.6% (**Table 4.8.3**). **Sub-alternatives 3c** (10 fish/vessel/day) and **3d** (12 fish/vessel/day), which would apply during the “spawning months”, would result in a decrease in commercial landings compared to **Alternative 1 (No Action)** because the current 10 fish limit is per person. Therefore, under current regulations, a one-day trip with two people could potentially land 20 mutton snapper. However, under **Sub-alternatives 3c** and **3d** a one-day trip could only result in 10 or 12 mutton snapper harvested, respectively, regardless of the number of people on the boat. **Sub-alternative 3c** (10 fish/vessel/day during April-June) would result in a slightly higher (5%) reduction in harvest than **Preferred Sub-alternative 2c** (500 lbs ww during the regular season), whereas **Sub-alternative 3d** (12 fish/vessel/day during April-June) would result in a similar expected reduction in harvest as under **Preferred Sub-alternative 2c** during the regular season. Overall, if the South Atlantic Council were to propose adoption of both preferred alternatives under this action, commercial landings of mutton snapper would be expected to decrease by about 17%.

Table 4.8.3. Projected percent decrease in commercial landings of mutton snapper for commercial trip limits proposed under Preferred Alternative 3 of Action 8. Preferred alternatives indicated in bold.

Spawning Season	Trip Limit					
	No Retention	2 fish/person/day	3 fish/person/day	5 fish/person/day	10 fish/vessel/day	12 fish/vessel/day
May-June	-35.8%	-20.0%	-16.3%	-8.6%	-4.1%	-2.8%
April-June	-41.7%	-23.5%	-19.3%	-13.6%	-5.0%	-3.5%
April-July	-52.6%	-29.6%	-24.2%	-17.1%	-6.9%	-5.1%
May-July	-46.6%	-29.6%	-21.3%	-14.9%	-6.0%	-4.5%

Source: NMFS SERO. Commercial logbook data 2012-2014

Trip limits do not generally result in biological effects, positive or negative, since harvest is constrained by the ACL to a level that is sustainable over the long-term. However, as with recreational bag limits, measures that reduce landings and limit fishing mortality when a species is most vulnerable to harvest, such as during formation of spawning aggregations, would be biologically beneficial. As such, **Preferred Alternative 3** and its sub-alternatives would be more biologically beneficial than **Preferred Alternative 2** and its sub-alternatives since they would result in a reduction in commercial harvest and diminish fishing pressure on spawning individuals. However, even though **Alternative 1 (No Action)** places some level of constraint on commercial harvest of mutton snapper during months of peak spawning in South Florida and the Florida Keys, commercial landings have been highest during this time of year (**Figure 4.8.1** and **Table 4.8.2**) indicating that current regulations are ineffective. Therefore, **Preferred Alternative 3** and its sub-alternatives would likely result in biological benefits relative to **Alternative 1 (No Action)**. Among the **Preferred Alternative 3** sub-alternatives, **Sub-alternative 3e** would be the most biologically beneficial to the mutton snapper stock as it would prohibit commercial harvest during the spawning months. In terms of discards, **Sub-alternative 3e** has the potential of resulting in increased levels since retention would be prohibited during the time of the year that commercial landings have been highest. However, mutton snapper have a low discard mortality rate (15%); hence, no additional negative biological effects would be expected from alternatives that allow some retention during the designated “spawning months.”

The alternatives and sub-alternatives under this action would not significantly modify the way in which the snapper grouper fishery is prosecuted in terms of gear types used. Therefore, there are no additional impacts on ESA-listed species or designated critical habitats anticipated as a result of this action (see **Section 3.2.5** for a detailed description of ESA-listed species and critical habitat in the action area). Furthermore, no additional impacts on EFH or EFH-HAPCs are expected to result from any of the alternatives considered for this action (see **Section 3.1.3** and **Appendix H** for detailed descriptions of EFH in the South Atlantic region).

4.8.2 Economic Effects

Generally, trip limits are not considered to be economically efficient because they require an increase in the number of trips and associated trip costs to land the same amount of fish. However, the negative economic effects of this inefficiency can be offset by price support resulting from the supply limitations and the lengthening of seasons. Given the fairly restrictive ACL of mutton snapper, the alternative with the fewest number of trips that have to stop targeting mutton snapper because the trip limit has been reached would result in the least amount of direct negative economic effects, assuming the season does not close. There are no specific trip costs available for trips landing mutton snapper; therefore, specific values associated with trip costs cannot be estimated.

The sub-alternatives of **Preferred Alternative 2** set trip limits during the “regular season.” The lower the trip limit, the more likely some commercial vessels will experience negative economic effects. Lower trip limits may reduce profitability for commercial vessels on some trips through a reduction in revenue and efficiency. Some permit holders are restricted to a 225-pound limit of snapper grouper species and would not be affected by the commercial trip limits in **Preferred Alternative 2**. For the remaining permit holders, negative economic effects may occur due to trip limits proposed in **Preferred Alternative 2**; however, these effects are expected to be minimal on most trips, as the vast majority of commercial trips land 300 lbs ww or less of mutton snapper per trip (**Figure 4.8.3**). Nevertheless, there are some negative economic effects expected to occur in comparison to **Alternative 1 (No Action)**. These effects are shown in **Table 4.8.4** and are based on the reductions specified in **Table 4.8.2** in relation to average mutton snapper landings from 2010-2014 (**Table 3.3.10**). **Sub-alternative 2a** sets the lowest trip limit and is expected to have the largest negative, short-term economic effect followed by **Sub-alternative 2b** and **Preferred Sub-alternative 2c**. The decrease in ex-vessel value of mutton snapper landings expected to occur due to **Preferred Sub-alternative 2c** is \$6,411 (2015 dollars).

Table 4.8.4. Estimated change in the ex-vessel value (2015 dollars) of commercial mutton snapper landings in the first year of implementation as a result of commercial trip limits during the “regular season”, as specified in **Preferred Alternative 2**.

Regular Season	Trip Limit		
	300 lbs ww	400 lbs ww	500 lbs ww
July - April	\$10,397	\$7,971	\$6,411
July - March	\$10,224	\$7,798	\$6,411
August - March	\$7,105	\$5,198	\$3,985
August - April	\$7,278	\$5,198	\$3,985

The sub-alternatives of **Preferred Alternative 3** set trip limits during the designated “spawning months” (**Action 5**). The realized severity of such impacts on a commercial trip would be based on the overall dependence a vessel has on mutton snapper, the ability of the vessel to exceed the current trip limit specified during May and June in **Alternative 1 (No Action)**, and the vessel’s ability to substitute other species to make up for loss of revenue from reduced mutton snapper landings. **Table 4.8.5** shows estimated short-term reductions in the ex-vessel value of mutton snapper landings under trip limits specified in **Preferred Alternative 3** based on reductions specified in **Table 4.8.3** in relation to average mutton snapper landings from 2010-2014 (**Table 3.3.10**). In comparison to **Alternative 1 (No Action)**, **Sub-alternative 3e** specifies no retention during the “spawning months” and is expected to have the largest negative, short-term economic effect followed by **Sub-alternative 3a**, **Sub-alternative 3b**, **Preferred Sub-alternative 3f**, **Sub-alternative 3c**, and **Sub-alternative 3d**. The decrease in ex-vessel value of mutton snapper landings expected to occur due to **Preferred Sub-alternative 3f** is \$23,567 (2015 dollars).

Table 4.8.5. Estimated change in the ex-vessel value (2015 dollars) of commercial mutton snapper landings in the first year of implementation as a result of commercial trip limits during the “spawning months”, as specified in **Preferred Alternative 3**.

Spawning Season	Trip Limit					
	No Retention	2 fish/ person/day	3 fish/ person/day	5 fish/ person/day	10 fish/ vessel/day	12 fish/ vessel/day
May-June	\$62,037	\$34,658	\$28,246	\$14,903	\$7,105	\$4,852
April-June	\$72,262	\$40,723	\$33,445	\$23,567	\$8,664	\$6,065
April-July	\$91,150	\$51,294	\$41,936	\$29,632	\$11,957	\$8,838
May-July	\$80,753	\$51,294	\$36,911	\$25,820	\$10,397	\$7,798

4.8.3 Social Effects

Commercial fishermen in the communities identified in **Section 3.3.2** would likely be those affected by a change in commercial harvest limits for mutton snapper. However, it is likely that fishermen who have targeted mutton snapper in recent years also target other species, and would be able to adjust their businesses to adapt to regulatory changes. In general, a commercial trip limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded, but trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Additionally, if the trip limit is too low, the commercial ACL may not be met.

The effects of establishing a trip limit for non-spawning season months (**Preferred Alternative 2**) would depend on the level of landings of mutton for commercial trips in recent years. In general, most trips land less than 300 lbs ww of mutton snapper, and a large proportion lands under 50 lbs ww per trip (**Figure 4.8.3**). This suggests that mutton snapper are part of a varied catch combination on commercial trips. The expected effects on commercial fishermen on trips targeting mutton snapper (likely along with several other species on the same trip) under

Sub-alternative 2a, Sub-alternative 2b, and Preferred Sub-alternative 2c are expected to be minimal to none.

The effects of the vessel limit for the spawning season (**Preferred Alternative 3**) would depend on if commercial vessels were reaching the limits in **Alternative 1 (No Action)** and the level of restriction relative to current commercial harvest. During the proposed “spawning months”, most commercial trips land low numbers of mutton snapper (**Figure 4.8.4**). Even with a possession limit proposed under **Sub-alternatives 3a-3d and 3f (Preferred)**, there would likely be minimal effects on commercial fishermen on trips targeting mutton snapper (likely as part of multi-species trips). **Sub-alternative 3e** would be the most restrictive and could have negative effects on commercial vessels if mutton snapper is a primary target species, but would not be expected to have more than minimal effects for most commercial fishermen because it is likely that these trips target other species as well, and landings of mutton snapper per trip are minimal. The lower vessel limits would have more negative effects for vessels with more people on board; so (after no retention under **Sub-alternative 3e**) **Sub-alternative 3a** could have the most negative effects due to restrictions on the number of fish that can be landed, followed by **Sub-alternative 3b, Preferred Sub-alternative 3f, Sub-alternative 3c, and Sub-alternative 3d**. However, under current fishery conditions, it is likely that only a limit that would result in 4 or less fish per vessel per trip (**Sub-alternatives 3a and 3b**) could have negative effects on commercial fishermen, and those would be minimal effects.

4.8.4 Administrative Effects

Alternative 1 (No Action) would have less administrative impacts than **Alternatives 2 (Preferred) and 3 (Preferred)**. Administrative impacts associated with **Alternatives 2 (Preferred) and 3 (Preferred)** may cause temporary administrative burdens in the form of rulemaking, outreach, education, monitoring, and enforcement. However, NMFS has implemented trip limits for other snapper grouper species and the impacts associated with **Alternative 2 (Preferred) and 3 (Preferred)** are expected to be minor.

Chapter 5. Council's Choice for the Preferred Alternatives

5.1 Action 1. Specify maximum sustainable yield (MSY) for mutton snapper in the South Atlantic Region

5.1.1 Snapper Grouper Advisory Panel (AP) Comments and Recommendations

The Snapper Grouper AP discussed Amendment 41 during their April 26-27, 2016, meeting. At that time, actions in Amendment 41 were numbered differently and revisions have been made to the language of actions and alternatives in the amendment. Hence, the AP's motions may not reflect the chronology of actions/alternatives or the current language. The Snapper Grouper AP had no comments or recommendations regarding specification of MSY for mutton snapper in the South Atlantic.

Alternatives*

1. No Action. MSY for mutton snapper in the South Atlantic equals the yield produced by F_{MSY} . $F_{30\%SPR}$ is used as the F_{MSY} proxy. The value is not specified.

2. MSY equals the yield produced by F_{MSY} or the F_{MSY} proxy. MSY and F_{MSY} are recommended by the most recent SEDAR/SSC.

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

5.1.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP received a briefing on Amendment 41 during their March 7-8, 2016, meeting. The Law Enforcement AP had no comments or recommendations.

5.1.3 Scientific and Statistical Committee (SSC) Comments and Recommendations

The SSC reviewed the SEDAR 15A update (2015) for mutton snapper at their April 28-30, 2015, meeting. An excerpt from the SSC's report for that meeting is below.

The SSC reviewed the mutton snapper SEDAR 15A assessment update conducted by Florida FWC. The Committee consensus was that the update represents the best scientific information available and can, therefore, be used to provide management advice.

Specific comments and discussion points brought up during the SSC meeting included:

- The SSC expressed concern that, despite improvements in the data streams and the fact that the analytical team tried to follow CIE reviewer recommendations from the previous assessment, a few problems either developed or worsened during the update:

- Patterns in residuals for some of the indices and the commercial discards.*
- Poor fit to the age composition.*
- Problems estimating selectivity for some of the fleets.*

- However, the change in magnitude of the MSY estimate between the prior and this assessment seems to reflect improvements in how the update model handles fishing mortality and selectivity (i.e., improved selectivity estimates prevent the assumption of a large cryptic biomass as observed in SEDAR 15A).

Since this assessment falls under Tier 1 of the SAFMC ABC control rule, ABC was obtained according to a P^* value. A summary of results from applying the ABC control rule is presented below:

1. Assessment Information: Tier 2 (-2.5%): an SPR-based proxy was used for MSY benchmarks.
 2. Uncertainty: Tier 3, medium (-5.0%): many of the uncertainties are well documented but did not seem to take into account problems with fitting the indices and the age comps.
 3. Stock Status: Tier 2, Not Overfished, No Overfishing is occurring but stock may be in close proximity to benchmark values (-2.5%).
 4. Productivity-Susceptibility Analysis: High Risk (-10%): based on the MRAG report.
- In total, these results provide for an adjustment score of 20%, and a P^* of 30%. The SSC recommends using 5-year projections at $P^*=50\%$ for OFL and at $P^*=30\%$ for ABC.

SSC Mutton Snapper Recommendations

Criteria	Deterministic	Probabilistic
Overfished evaluation	Not overfished: $SSB/SSB_{F_{30\%}}=1.13$	
Overfishing evaluation	Not overfishing: $F/F_{30\%SPR}=0.65$	
MFMT ($F_{30\%SPR}$)	0.18	
$SSB_{30\%SPR}$ (lbs females)	4,649,200	
MSST (lbs females)	4,137,700	
Y at $F_{30\%SPR}$ (MSY proxy, lbs)	912,500	
Y at $F_{40\%SPR}$ (lbs)	874,000	
ABC Control Rule Adjustment		20%
P-Star		30%

5.1.4 Public Comments and Recommendations

The South Atlantic Fishery Management Council (South Atlantic Council) held scoping meetings for Amendment 41 from January 25 to February 3, 2016. Meetings in Florida were held in conjunction with workshops conducted by the Florida Fish and Wildlife Conservation Commission (FWC). Public hearings were held via webinar on August 2, 2016, and in-person on August 15-17, 2016.

One member of the public supported the South Atlantic Council's preferred alternative to specify MSY for mutton snapper in the South Atlantic.

5.1.5 South Atlantic Council's Conclusion

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) establishes MSY as the basis for managing a fishery. Specification of the MSY for a stock does not in itself alter the current harvest or use of a fishery resource. This biological reference point establishes a benchmark for management of the mutton snapper stock in the South Atlantic; it

does not in itself entail a change to regulations unless a comparison of the status of the stock with the benchmark indicates that management adjustments are necessary. As a benchmark, MSY would not limit how, when, where, or with what frequency participants in the snapper grouper fishery engage in harvesting mutton snapper. The South Atlantic Council is revising MSY for mutton snapper because the 2008 stock assessment (SEDAR 15A) was updated in 2015 with data through 2013 (SEDAR 15A Update 2015). Prior to that, MSY for mutton snapper was defined as the yield produced by fishing at the fishing mortality rate that would produce MSY (F_{MSY}) or the F_{MSY} proxy (substitute), which was set at $F_{30\%SPR}$ but no actual value was specified. Hence, through this amendment, the South Atlantic Council is adopting the updated MSY for mutton snapper in the South Atlantic and changing the specification process such that adjustments to the MSY could be made automatically based on the latest stock assessment and recommendation from the SSC that is accepted by the South Atlantic Council, as opposed to modifications to maximum sustainable yield made through a Snapper Grouper FMP amendment or framework adjustment.

The South Atlantic Council concluded that **Preferred Alternative 2** best meets the purpose and need to implement measures expected to prevent overfishing and achieve optimum yield (OY) while minimizing, to the extent practicable, adverse social and economic effects. The preferred alternative also best meets the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.1.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The Vision Blueprint for the Snapper Grouper Fishery (Vision Blueprint) was approved in December 2015 and is intended to inform management of the snapper grouper fishery through 2020. As such, the Vision Blueprint serves as a “living document” to help guide future management, builds on stakeholder input and how the South Atlantic Council envisions future management of the fishery, guides the development of new amendments that address priority objectives and strategies, and illustrates actions that could be developed through the regular amendment process. The Vision Blueprint is organized into four strategic goal areas: (1) Science, (2) Management, (3) Communication, and (4) Governance. Each goal area has a set of objectives, strategies, and actions.

Action 1 to specify the maximum sustainable yield for mutton snapper in the South Atlantic does not directly respond to objectives outlined in the Vision Blueprint; however, it addresses the broad Science goal to ensure that “*management decisions for the snapper grouper fishery are based upon robust, defensible science that considers qualitative and quantitative data analyzed in a timely, clear, and transparent manner that builds stakeholder confidence.*” **Action 1** ensures that the mutton snapper resource is managed in accordance with the latest scientific information and, therefore, addresses long-term sustainable management of mutton snapper in the South Atlantic Region.

5.2 Action 2. Specify minimum stock size threshold (MSST) for mutton snapper in the South Atlantic Region

5.2.1 Snapper Grouper AP Comments and Recommendations

The Snapper Grouper AP discussed Amendment 41 during their April 26-27, 2016, meeting. At that time, actions in Amendment 41 were numbered differently and revisions have been made to the language of actions and alternatives in the amendment. Hence, the AP's motions may not reflect the chronology of actions/alternatives or the current language. The Snapper Grouper AP had no comments or recommendations regarding specification of MSST for mutton snapper in the South Atlantic.

*Alternatives**

1 (No Action). MSST for mutton snapper is $MSST = SSB_{MSY} ((1-M) \text{ or } 0.5, \text{ whichever is greater})$. The value is not specified.

2. MSST = 50% of SSB_{MSY}

3. MSST = 75% of SSB_{MSY}

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

5.2.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP received a briefing on Amendment 41 during their March 7-8, 2016, meeting. The Law Enforcement AP had no comments or recommendations.

5.2.3 SSC Comments and Recommendations

The SSC reviewed the SEDAR 15A update (2015) for mutton snapper at their April 28-30, 2015 meeting. An excerpt from the SSC's report for that meeting is below.

The SSC reviewed the mutton snapper SEDAR 15A assessment update conducted by Florida FWC. The Committee consensus was that the update represents the best scientific information available and can, therefore, be used to provide management advice.

Specific comments and discussion points brought up during the SSC meeting included:

- The SSC expressed concern that, despite improvements in the data streams and the fact that the analytical team tried to follow CIE reviewer recommendations from the previous assessment, a few problems either developed or worsened during the update:

- Patterns in residuals for some of the indices and the commercial discards.*
- Poor fit to the age composition.*
- Problems estimating selectivity for some of the fleets.*

- However, the change in magnitude of the MSY estimate between the prior and this assessment seems to reflect improvements in how the update model handles fishing mortality and selectivity (i.e., improved selectivity estimates prevent the assumption of a large cryptic biomass as observed in SEDAR 15A).

Since this assessment falls under Tier 1 of the SAFMC ABC control rule, ABC was obtained according to a P^* value. A summary of results from applying the ABC control rule is presented below:

1. *Assessment Information: Tier 2 (-2.5%): an SPR-based proxy was used for MSY benchmarks.*
 2. *Uncertainty: Tier 3, medium (-5.0%): many of the uncertainties are well documented but did not seem to take into account problems with fitting the indices and the age comps.*
 3. *Stock Status: Tier 2, Not Overfished, No Overfishing is occurring but stock may be in close proximity to benchmark values (-2.5%).*
 4. *Productivity-Susceptibility Analysis: High Risk (-10%): based on the MRAG report.*
- In total, these results provide for an adjustment score of 20%, and a P^* of 30%. The SSC recommends using 5-year projections at $P^*=50%$ for OFL and at $P^*=30%$ for ABC.*

SSC Mutton Snapper Recommendations

Criteria	Deterministic	Probabilistic
Overfished evaluation	Not overfished: $SSB/SSB_{F30\%}=1.13$	
Overfishing evaluation	Not overfishing: $F/F_{30\%SPR}=0.65$	
MFMT ($F_{30\%SPR}$)	0.18	
$SSB_{30\%SPR}$ (lbs females)	4,649,200	
MSST (lbs females)	4,137,700	
Y at $F_{30\%SPR}$ (MSY proxy, lbs)	912,500	
Y at $F_{40\%SPR}$ (lbs)	874,000	
ABC Control Rule Adjustment		20%
P-Star		30%

5.2.4 Public Comments and Recommendations

The South Atlantic Council held scoping meetings for Amendment 41 from January 25 to February 3, 2016. Meetings in Florida were held in conjunction with workshops conducted by the FWC. Public hearings were held via webinar on August 2, 2016, and in-person on August 15-17, 2016.

One member of the public supported the South Atlantic Council's preferred alternative to specify MSST for mutton snapper in the South Atlantic.

5.2.5 South Atlantic Council's Conclusion

The South Atlantic Council has typically set the minimum stock size threshold level at one minus the natural mortality (M) (or 0.5, whichever is greater) times the spawning stock biomass at the maximum sustainable yield (SSB_{MSY}). However, when natural mortality is relatively small (i.e., less than 0.25), the current definition of the MSST would trigger a rebuilding plan if biomass fell slightly below SSB_{MSY} . In this situation, natural variation in recruitment could cause stock biomass to frequently alternate between an overfished and rebuilt condition. This may lead to administrative and potentially adverse economic impacts, as the occurrence of unnecessary rebuilding plans coupled with their correspondingly restrictive management plans

would increase. To avoid this, the South Atlantic Council is redefining the minimum stock size threshold level in this amendment for mutton snapper. **Preferred Alternative 3** would set the MSST minimum stock size threshold at 75% of SSB_{MSY} and thus provide a larger buffer than the current one between the levels at which the stock is considered to be at equilibrium (SSB_{MSY}) and the overfished level (minimum stock size threshold).

Other regions in the U.S. have set MSSTs at 50% of SSB_{MSY} , and **Alternative 2** considers setting the minimum stock size threshold at this level. However, if the minimum stock size threshold is set at 50% of SSB_{MSY} , by the time a stock is found to be overfished, significant management measures may be required to rebuild the stock due to the low biomass levels. **Preferred Alternative 3**, which would trigger a rebuilding plan when biomass is at 75% of SSB_{MSY} , would be expected to result in greater biological benefits than **Alternative 2**, which would have a lower biomass threshold for an overfished determination. At their October 2013 meeting, the South Atlantic Council's SSC acknowledged that the 75% SSB_{MSY} approach is an acceptable choice for setting the MSST, and they voiced no concern regarding the adoption of this management reference point for South Atlantic Council managed species.

The change in minimum stock size threshold definition could result in some stocks being declared "not overfished" that would otherwise be declared "overfished" without this change. However, as noted previously, the requirement to prevent overfishing ensures that even these stocks would be subjected to fishing mortality rates that would increase biomass to levels above SSB_{MSY} , even without a formal rebuilding plan. Therefore, little risk to long-term sustainability can be expected from this change.

The South Atlantic Council understands the importance of incorporating the impacts of environmental variability on fish populations and the uncertainty around stock assessment estimates in the management process. The South Atlantic Council's choice of **Preferred Alternative 3** reflects this commitment. Further, **Preferred Alternative 3** best meets the purpose of updating the minimum stock size threshold based on the results of the most recent stock assessment. **Preferred Alternative 3** also best meets the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.2.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The Vision Blueprint was approved in December 2015 and is intended to inform management of the snapper grouper fishery through 2020. As such, the Vision Blueprint serves as a "living document" to help guide future management, builds on stakeholder input and how the South Atlantic Council envisions future management of the fishery, guides the development of new amendments that address priority objectives and strategies, and illustrates actions that could be developed through the regular amendment process. The Vision Blueprint is organized into four strategic goal areas: (1) Science, (2) Management, (3) Communication, and (4) Governance. Each goal area has a set of objectives, strategies, and actions.

Action 2 to specify the minimum stock size threshold for mutton snapper in the South Atlantic does not directly respond to objectives outlined in the Vision Blueprint; however, it addresses the broad Science goal to ensure that “*management decisions for the snapper grouper fishery are based upon robust, defensible science that considers qualitative and quantitative data analyzed in a timely, clear, and transparent manner that builds stakeholder confidence.*” **Action 2** ensures that the mutton snapper resource is managed in accordance with the latest scientific information and, therefore, addresses long-term sustainable management of mutton snapper in the South Atlantic Region.

5.3 Action 3. Revise annual catch limits (ACLs) and optimum yield (OY) for mutton snapper in the South Atlantic Region

5.3.1 Snapper Grouper AP Comments and Recommendations

The Snapper Grouper AP discussed Amendment 41 during their April 26-27, 2016, meeting. At that time, actions in Amendment 41 were numbered differently and revisions have been made to the language of actions and alternatives in the amendment. Hence, the AP's motions may not reflect the chronology of actions/alternatives or the current language. The Snapper Grouper AP had no comments or recommendations regarding specification of the ACL and OY for mutton snapper in the South Atlantic.

5.3.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP received a briefing on Amendment 41 during their March 7-8, 2016, meeting. The Law Enforcement AP had no comments or recommendations.

5.3.3 SSC Comments and Recommendations

The SSC reviewed the SEDAR 15A update (2015) for mutton snapper at their April 28-30, 2015, meeting. An excerpt from the SSC's report for that meeting pertaining to ABC is below.

Since this assessment falls under Tier 1 of the SAFMC ABC control rule, ABC was obtained according to a P value. A summary of results from applying the ABC control rule is presented below:*

- 1. Assessment Information: Tier 2 (-2.5%): an SPR-based proxy was used for MSY benchmarks.*
 - 2. Uncertainty: Tier 3, medium (-5.0%): many of the uncertainties are well documented but did not seem to take into account problems with fitting the indices and the age comps.*
 - 3. Stock Status: Tier 2, Not Overfished, No Overfishing is occurring but stock may be in close proximity to benchmark values (-2.5%).*
 - 4. Productivity-Susceptibility Analysis: High Risk (-10%): based on the MRAG report.*
- In total, these results provide for an adjustment score of 20%, and a P* of 30%. The SSC recommends using 5-year projections at P*=50% for OFL and at P*=30% for ABC.*

*Alternatives**

1 (No Action). The current ABC for mutton snapper is 926,600 lbs ww based on a jurisdictional allocation for the South Atlantic of 82% of the ABC and is set equal to OY and the total ACL. The commercial ACL is 157,743 lbs ww (17.02%) and the recreational ACL is 768,857 lbs ww (82.98%).

2. Specify ACLs and OY for the South Atlantic using the existing sector allocations (17.02% commercial and 82.98% recreational) and specify the recreational ACL in numbers of fish. The ACLs specified for 2020 would remain in place until modified.

Sub-alternative 2a. ACL = OY = ABC.

Sub-alternative 2b. ACL = OY = 95% ABC.

Sub-alternative 2c. ACL = OY = 90% ABC.

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

5.3.4 Public Comments and Recommendations

The South Atlantic Council held scoping meetings for Amendment 41 from January 25 to February 3, 2016. Meetings in Florida were held in conjunction with workshops conducted by the FWC. Public hearings were held via webinar on August 2, 2016, and in-person on August 15-17, 2016.

Members of the public stated that the annual catch limit should be set below the acceptable biological catch and the South Atlantic Council should consider the level of discards when setting annual catch limits.

5.3.5 South Atlantic Council's Conclusion

The OY is a long-term average amount of desired yield from a stock, stock complex, or fishery that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems. The Magnuson-Stevens Act does not preclude OY from being equal to the acceptable biological catch or the total annual catch limit. The Magnuson-Stevens Act indicates that optimum yield “is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor.” The South Atlantic Council has been frequently setting optimum yield equal to the acceptable biological catch and below the maximum sustainable yield to provide greater assurance that overfishing is prevented, the long-term average biomass is near or above the biomass that would produce the maximum sustainable yield (B_{MSY}), and overfished stocks are rebuilt within the allotted timeframe for the species in question. Since mutton snapper are neither overfished nor undergoing overfishing, the South Atlantic Council opted to forego a precautionary buffer between the ACL (and OY) and the acceptable biological catch (ABC).

In general, an ACL cannot exceed the ABC and may be set annually or on a multiyear plan basis. Annual catch limits in coordination with accountability measures (AMs) must prevent overfishing. The National Standard 1 guidelines specify that Councils can choose to account for management uncertainty by setting the ACL below the ABC but states that annual catch limits may typically be set very close to the ABC. The Commercial Landings Monitoring System came online in June 2012 and is now being used to track commercial landings of federally managed fish species. This system is able to track individual dealer reports, track compliance with reporting requirements, project harvest closures using five different methods, and analyze why annual catch limits are exceeded. The improved commercial monitoring mechanisms now in place in the South Atlantic Region are expected to reduce the likelihood of commercial ACL overages. Additionally, a Joint Dealer Reporting Amendment, which was implemented on August 7, 2014, has increased the required reporting frequency for dealers to once per week, and requires a single dealer permit for all finfish dealers in the Southeast Region. On January 27, 2014, the Generic For-Hire Reporting Amendment was implemented (78 FR 78779), which required all federally permitted headboats in the South Atlantic to report landings information electronically and on a weekly basis. The new Commercial Landings Monitoring System and actions in the Joint Generic Dealer and Generic For-Hire Reporting amendments are expected to

provide more timely and accurate data reporting and would thus reduce the incidence of quota overages.

The South Atlantic Council concluded that **Preferred Alternative 2, Preferred Sub-alternative 2a**, best meets the purpose to update the ABC and ACL for the mutton snapper component of the snapper grouper fishery based on the results of the most recent stock assessment. The preferred alternatives also best meet the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.3.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The Vision Blueprint was approved in December 2015 and is intended to inform management of the snapper grouper fishery through 2020. As such, the Vision Blueprint serves as a “living document” to help guide future management, builds on stakeholder input and how the South Atlantic Council envisions future management of the fishery, guides the development of new amendments that address priority objectives and strategies, and illustrates actions that could be developed through the regular amendment process. The Vision Blueprint is organized into four strategic goal areas: (1) Science, (2) Management, (3) Communication, and (4) Governance. Each goal area has a set of objectives, strategies, and actions.

Action 3 to specify the ACL and OY for mutton snapper in the South Atlantic does not directly respond to objectives outlined in the Vision Blueprint; however, it addresses the broad Science goal to ensure that “*management decisions for the snapper grouper fishery are based upon robust, defensible science that considers qualitative and quantitative data analyzed in a timely, clear, and transparent manner that builds stakeholder confidence.*” **Action 3** ensures that utilization of the mutton snapper resource can continue in a manner that responds to the best scientific information available, promotes achieving OY, and addresses management uncertainty.

5.4 Revise recreational annual catch target (ACT) for mutton snapper in the South Atlantic Region

5.4.1 Snapper Grouper AP Comments and Recommendations

The Snapper Grouper AP discussed Amendment 41 during their April 26-27, 2016, meeting. At that time, actions in Amendment 41 were numbered differently and revisions have been made to the language of actions and alternatives in the amendment. Hence, the AP's motions may not reflect the chronology of actions/alternatives or the current language. The Snapper Grouper AP had no comments or recommendations regarding revising of the recreational ACT for mutton snapper in the South Atlantic.

5.4.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP received a briefing on Amendment 41 during their March 7-8, 2016, meeting. The Law Enforcement AP had no comments or recommendations.

5.4.3 SSC Comments and Recommendations

During their May 3-5, 2016, meeting, the SSC received a summary document detailing actions and alternatives in Amendment 41 as well as preliminary analyses. Due to lack of time, the SSC did not discuss the amendment at that meeting. During their October 18-20, 2016, meeting, the SSC received a briefing on the analyses used to support management actions in Amendment 41. The SSC did not have any comments or recommendations.

5.4.4 Public Comments and Recommendations

The South Atlantic Council held scoping meetings for Amendment 41 from January 25 to February 3, 2016. Meetings in Florida were held in conjunction with workshops conducted by the FWC. Public hearings were held via webinar on August 2, 2016, and in-person on August 15-17, 2016.

*Alternatives**

1 (No Action). The current ACT is 668,906 lbs ww and applies to mutton snapper throughout the South Atlantic Council's jurisdiction. The ACT = recreational $ACL \cdot (1 - PSE)$ or $ACL \cdot 0.5$, whichever is greater, and where Percent Standard Error (PSE) = 13% = average PSE 2005-2009 (for South Atlantic only).

2. Revise the ACT for mutton snapper for the recreational sector and specify in numbers of fish. The ACT for 2020 would remain in place until modified.

Sub-alternative 2a. ACT = recreational $ACL \cdot (1 - PSE)$ or $ACL \cdot 0.5$, whichever is greater.

Sub-alternative 2b. ACT = 85% recreational ACL.

Sub-alternative 2c. ACT = 75% recreational ACL.

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

One member of the public stated that the proposed recreational ACT is acceptable for now; however, the South Atlantic Council should consider stepping down further from the ABC so that specifying a recreational ACT would not be necessary in the future.

5.4.5 South Atlantic Council's Conclusion

The South Atlantic Council reasoned that the level of management uncertainty for the recreational component of the mutton snapper fishery is currently high enough to warrant specification of a recreational ACT. Specification of a recreational ACT is precautionary since the South Atlantic Council has not used ACTs to trigger accountability measures because it is anticipated that improvements in reporting would significantly reduce management uncertainty. Should the South Atlantic Council, in the future, utilize ACTs to manage recreational harvest, these values would already have been specified and become part of the regulations. The current ACT incorporates the percent standard error for the recreational catch estimates into the formula and applies to the South Atlantic mutton snapper stock. Percent standard errors are incorporated into the current formula to add a larger buffer for species that are not so common in the recreational catch. For such species the percent standard errors are large, indicating higher uncertainty in the recreational estimates. Hence, using the percent standard error in the formula to set the annual catch target further accounts for uncertainty. On the other hand, when recreational landings estimates for a species are precise, the percent standard errors are small, and consequently the buffer to account for uncertainty is reduced accordingly. For mutton snapper, percent standard errors for recreational estimates are relatively low, indicating a moderate level of uncertainty in those estimates. However, rather than continuing to use the current formula to specify the recreational ACT for mutton snapper, the South Atlantic Council selected to specify the recreational ACT at 85% of the recreational ACL (**Preferred Sub-alternative 2b**). This results in slightly higher recreational ACTs than under the status quo.

The South Atlantic Council concluded that **Preferred Sub-alternative 2b** best meets the purpose to update the recreational ACT for the mutton snapper component of the snapper grouper fishery based on the results of the most recent stock assessment. The preferred alternative also best meets the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.4.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The Vision Blueprint was approved in December 2015 and is intended to inform management of the snapper grouper fishery through 2020. As such, the Vision Blueprint serves as a “living document” to help guide future management, builds on stakeholder input and how the South Atlantic Council envisions future management of the fishery, guides the development of new amendments that address priority objectives and strategies, and illustrates actions that could be developed through the regular amendment process. The Vision Blueprint is organized into four strategic goal areas: (1) Science, (2) Management, (3) Communication, and (4) Governance. Each goal area has a set of objectives, strategies, and actions.

Action 4 to specify recreational ACTs for the mutton snapper stock in the South Atlantic does not directly respond to objectives outlined in the Vision Blueprint; however, it addresses the broad Science goal to ensure that “*management decisions for the snapper grouper fishery are based upon robust, defensible science that considers qualitative and quantitative data analyzed in a timely, clear, and transparent manner that builds stakeholder confidence.*” **Action 4** ensures that utilization of the mutton snapper resource can continue in a manner that responds to the best scientific information available and addresses management uncertainty.

5.5 Action 5. Modify the commercial and recreational minimum size limit for mutton snapper in the South Atlantic Region

5.5.1 Snapper Grouper AP Comments and Recommendations

The Snapper Grouper AP discussed Amendment 41 during their April 26-27, 2016, meeting. At that time, actions in Amendment 41 were numbered differently and revisions have been made to the language of actions and alternatives in the amendment. Hence, the AP's motions may not reflect the chronology of actions/alternatives or the current language. The AP approved the following motion regarding modification of the commercial and recreational minimum size limit for mutton snapper in the South Atlantic.

MOTION: RECOMMEND ALTERNATIVE 3 AS PREFERRED UNDER ACTION 8

Action 8. Modify mutton snapper minimum size limit in the South Atlantic region

Alternative 3. Increase the minimum size limit for mutton snapper in the South Atlantic region to 18 inches TL.

*Alternatives**

1 (No Action). The minimum size limit (MSL) for mutton snapper in the South Atlantic region is 16 inches total length (TL).

2. Increase to 17 inches TL.

3. Increase to 18 inches TL.

4. Increase to 19 inches TL.

5. Increase to 20 inches TL.

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

5.5.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP received a briefing on Amendment 41 during their March 7-8, 2016, meeting. The Law Enforcement AP had no comments or recommendations.

5.5.3 SSC Comments and Recommendations

During their May 3-5, 2016, meeting, the SSC received a summary document detailing actions and alternatives in Amendment 41 as well as preliminary analyses. Due to lack of time, the SSC did not discuss the amendment at that meeting. During their October 18-20, 2016, meeting, the SSC received a briefing on the analyses used to support management actions in Amendment 41. The SSC did not have any comments or recommendations.

5.5.4 Public Comments and Recommendations

The South Atlantic Council held scoping meetings for Amendment 41 from January 25 to February 3, 2016. Meetings in Florida were held in conjunction with workshops conducted by the FWC. Public hearings were held via webinar on August 2, 2016, and in-person on August 15-17, 2016.

Summary of scoping comments:

- Suggestions to consider increasing the minimum size limit to 18 inches, 20 inches, and 24 inches total length (TL).
- Consider a larger size limit for “on the water” vs. “from shore” to also give shore fishermen access to the resource.
- Suggestion to remove minimum size limit but set bag limit at 2 per person per day year round, and allow only one fish over 25 inches TL.
- Some stakeholders were not in favor of increasing the minimum size limit because of subsequent increase in regulatory discards and suggested considering regulations where a percentage of the catch can be undersize.

Summary of public hearing comments:

- Three commenters spoke in support for Alternative 1 (No Action).
- Twenty four commenters spoke in support of increasing the minimum size limit to 18 inches TL.
- Several people expressed concern about a possible increase in discard mortality problem with an increase in the minimum size limit.
- Three commenters supported an increase in the minimum size limit to 20 inches TL.
- Several commenters stated support for an increase in the minimum size limit as long as the bag limit remains at 10 fish/person/day within the snapper aggregate.
- Consider increasing the minimum size limit for the commercial sector only as recreational fishermen, especially shore anglers, do not have access to fish larger than 14-15 inches TL.

5.5.5 South Atlantic Council’s Conclusion

At their March 2016 meeting, the South Atlantic Council approved a motion to add an action to Amendment 41 to consider increasing the minimum size limit of mutton snapper. During scoping meetings held in early 2016, stakeholders consistently suggested an increase in the minimum size limit for mutton snapper, particularly in the Florida Keys. The Florida Fish and Wildlife Conservation Commission (FWC) also held workshops during the same time and the FWC representative on the South Atlantic Council reported much public interest in increasing the mutton snapper minimum size limit for both the commercial and recreational sectors. Not only does recent scientific research support such an increase based on the reproductive biology of mutton snapper, it is also the single most effective change to current management measures (based on projected landings) to achieve the necessary reduction in harvest to keep landings below the proposed ACL (see **Section 4.5.1**). Hence, the South Atlantic Council concluded that **Preferred Alternative 3** best meets the purpose to revise management measures for the mutton snapper component of the snapper grouper fishery based on the results of the most recent stock assessment and base management on the best scientific information available to achieve and maintain OY and to prevent overfishing while minimizing adverse social and economic effects. The preferred alternative also best meets the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.5.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The Vision Blueprint was approved in December 2015 and is intended to inform management of the snapper grouper fishery through 2020. As such, the Vision Blueprint serves as a “living document” to help guide future management, builds on stakeholder input and how the South Atlantic Council envisions future management of the fishery, guides the development of new amendments that address priority objectives and strategies, and illustrates actions that could be developed through the regular amendment process. The Vision Blueprint is organized into four strategic goal areas: (1) Science, (2) Management, (3) Communication, and (4) Governance. Each goal area has a set of objectives, strategies, and actions.

Action 5 to modify the minimum size limit for mutton snapper in the South Atlantic does not directly respond to objectives outlined in the Vision Blueprint; however, it addresses the broad Science goal to ensure that “*management decisions for the snapper grouper fishery are based upon robust, defensible science that considers qualitative and quantitative data analyzed in a timely, clear, and transparent manner that builds stakeholder confidence.*” As explained in **Section 4.5.1**, recent scientific evidence suggests that the current minimum size limit of 16 inches TL is below the size at which mutton snapper reach sexual maturity. Allowing harvest of immature individuals might lead to negative impacts at the population level, affect the health of the mutton snapper resource, and ultimately have negative socio-economic repercussions. **Action 5** also addresses the broad Management goal to “*adopt management strategies for the snapper grouper fishery that rebuild and maintain fishery resources, adapt to regional differences in the fishery, and consider the social and economic needs of fishing communities.*” **Action 5** responds to the latest scientific information available while ensuring that utilization of the mutton snapper resource can continue in a sustainable and biologically responsible manner. Furthermore, under the broad Management goal, **Action 5** responds to Objective 2, Strategy 2.5 to *consider measures to simplify regulations for both sectors* since the South Atlantic Council worked closely with the FWC to consider regulations that would be compatible in state and federal waters to simplify the regulatory environment to benefit resource users as well as law enforcement.

5.6 Action 6. Designate spawning months during which certain commercial and recreational management measures for mutton snapper should apply in the South Atlantic Region

5.6.1 Snapper Grouper AP Comments and Recommendations

The Snapper Grouper AP discussed Amendment 41 during their April 26-27, 2016, meeting. At that time, actions in Amendment 41 were numbered differently and revisions have been made to the language of actions and alternatives in the amendment. Hence, the AP's motions may not reflect the chronology of actions/alternatives or the current language. The AP approved the following motion regarding designation of "spawning months" for mutton snapper during which certain commercial and recreational management measures would apply in the South Atlantic.

MOTION: RECOMMEND NO ACTION FOR ACTION 5

Action 5. Designate spawning season during which commercial and recreational management measures for mutton snapper should apply

Alternative 1 (No Action). The spawning season for mutton snapper is designated as May-June).

5.6.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP received a briefing on Amendment 41 during their March 7-8, 2016, meeting. The Law Enforcement AP had no comments or recommendations.

5.6.3 SSC Comments and Recommendations

During their May 3-5, 2016, meeting, the SSC received a summary document detailing actions and alternatives in Amendment 41 as well as preliminary analyses. Due to lack of time, the SSC did not discuss the amendment at that meeting. During their October 18-20, 2016, meeting, the SSC received a briefing on the analyses used to support management actions in Amendment 41. The SSC did not have any comments or recommendations.

*Alternatives**

1 (No Action). Seasonal harvest limitations apply to the commercial sector during mutton snapper spawning in May and June each year. There are no comparable seasonal restrictions during May and June that apply to the recreational sector.

2. For regulatory purposes, designate the following as "spawning months." The remainder of the year would be the "regular season."

Sub-alternative 2a. April-June

Sub-alternative 2b. April-July

Sub-alternative 2c. May-July

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

5.6.4 Public Comments and Recommendations

The South Atlantic Council held scoping meetings for Amendment 41 from January 25 to February 3, 2016. Meetings in Florida were held in conjunction with workshops conducted by the FWC. Public hearings were held via webinar on August 2, 2016, and in-person on August 15-17, 2016.

Summary of scoping comments:

- Some support for prohibiting all fishing during the spawning months (May, June, July) or reducing bag limit to 2 per person.
- Close harvest in April and May. This would allow most fish to spawn at least once. If possible, close April through June.
- Fishermen who opposed a spawning season closure stated that they dive for grouper in May and expect to be able to also catch mutton snapper at that time. If mutton snapper were to be closed in May, those fishermen would be impacted.
- Concern that if too many older mutton snapper are harvested, the species may eventually follow the path of red snapper.
- Consider not specifying a “spawning season” because mutton snapper is dynamic and timing of spawning may shift.

Summary of public hearing comments:

- Some stakeholders were expressed support for Alternative 1 (No Action).
- Need better information on spawning periodicity or supply more rationale.
- Some support for preferred April-June spawning months.

5.6.5 South Atlantic Council’s Conclusion

Regulations to limit commercial harvest of mutton snapper during peak spawning months were initially implemented through Amendment 4 (SAFMC 1991). Stricter regulations on commercial harvest were implemented annually during May and June; however, no further restrictions were placed on the recreational sector during this time. When the South Atlantic Council began development of Amendment 41, the Florida Fish and Wildlife Conservation Commission (FWC) expressed interest in better defining the time of year during which possibly stricter regulations could be placed on mutton snapper harvest with the intent of protecting spawning fish. This was in response to widespread stakeholder concern about heavy exploitation of mutton snapper during the time the species is known to form large spawning aggregations in South Florida. Therefore, the South Atlantic Council included an action in Amendment 41 to designate “spawning months” during which management agencies could consider further restrictions on harvest. Based on extensive public input through South Atlantic Council meetings and FWC workshops, the months of April, May and June were selected as the “spawning months” for mutton snapper for regulatory purposes. Indeed, scientific evidence since Amendment 4 was implemented indicates that spawning activity begins during the April full moon and may extend through July. Hence, the South Atlantic Council reasoned that **Preferred Sub-alternative 2a** best meets the purpose to revise management measures for the mutton snapper component of the snapper grouper fishery based on the best scientific information available. The preferred alternative also best meets the objectives of the Snapper

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

5.6.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The Vision Blueprint was approved in December 2015 and is intended to inform management of the snapper grouper fishery through 2020. As such, the Vision Blueprint serves as a “living document” to help guide future management, builds on stakeholder input and how the South Atlantic Council envisions future management of the fishery, guides the development of new amendments that address priority objectives and strategies, and illustrates actions that could be developed through the regular amendment process. The Vision Blueprint is organized into four strategic goal areas: (1) Science, (2) Management, (3) Communication, and (4) Governance. Each goal area has a set of objectives, strategies, and actions.

Action 6 to designate the “spawning months” for mutton snapper during which certain commercial and recreational management measures should apply in the South Atlantic does not directly respond to objectives outlined in the Vision Blueprint; however, it addresses the broad Management goal to “*adopt management strategies for the snapper grouper fishery that rebuild and maintain fishery resources, adapt to regional differences in the fishery, and consider the social and economic needs of fishing communities.*” **Action 6** responds to the latest scientific information available while ensuring that utilization of the mutton snapper resource can continue in a sustainable and biologically responsible manner. Furthermore, under the broad Management goal, **Action 6** responds to Objective 2, Strategy 2.5 to *consider measures to simplify regulations for both sectors* since the South Atlantic Council worked closely with the FWC to consider regulations that would be compatible in state and federal waters to simplify the regulatory environment to benefit resource users as well as law enforcement.

5.7 Action 7. Modify mutton snapper recreational bag limit in the South Atlantic Region

5.7.1 Snapper Grouper AP Comments and Recommendations

The Snapper Grouper AP discussed Amendment 41 during their April 26-27, 2016, meeting. At that time, actions in Amendment 41 were numbered differently and revisions have been made to the language of actions and alternatives in the amendment. Hence, the AP's motions may not reflect the chronology of actions/alternatives or the current language. The AP approved the following motion regarding changes to the recreational bag limit for mutton snapper in the South Atlantic.

MOTION: RECOMMEND SUB-ALTERNATIVE 4B AS PREFERRED UNDER ACTION 6:

Action 6. Modify Mutton Snapper Recreational Bag Limit in the South Atlantic region

Alternative 4. Retain mutton snapper within the recreational 10 snapper aggregate bag limit in the South Atlantic, but specify bag limits for mutton snapper within the aggregate bag limit year round.
Sub-alternative 4b. 3 fish/person/day.

5.7.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP received a briefing on Amendment 41 during their March 7-8, 2016, meeting. The Law Enforcement AP had no comments or recommendations.

5.7.3 SSC Comments and Recommendations

During their May 3-5, 2016, meeting, the SSC received a summary document detailing actions and alternatives in Amendment 41 as well as preliminary analyses. Due to lack of time, the SSC did not discuss the amendment at that meeting. During their October 18-20, 2016, meeting, the SSC received a briefing on the analyses used to support management actions in Amendment 41. The SSC did not have any comments or recommendations.

*Alternatives**

1 (No Action). Mutton snapper is part of the aggregate 10 snapper bag limit in the South Atlantic that applies throughout the fishing year.

2. Retain mutton snapper within the 10-snapper aggregate bag limit, but specify a bag limit for mutton snapper during the "regular season" (i.e., non-spawning months).

- 2a. 4 fish/person/day
- 2b. 5 fish/person/day
- 2c. 10 fish/person/day

3. Retain mutton snapper within the 10-snapper aggregate bag limit, but specify bag/vessel limits for mutton snapper during the "spawning months"

- 3a. 2 fish/person/day
- 3b. 3 fish/person/day
- 3c. 10 fish/vessel/day
- 3d. 12 fish/vessel/day
- 3e. No retention

4. Retain mutton snapper within the 10-snapper aggregate bag limit, but specify bag limits for mutton snapper within the aggregate bag limit year round.

- 4a. 2 fish/person/day
- 4b. 3 fish/person/day
- 4c. 5 fish/person/day**

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

5.7.4 Public Comments and Recommendations

The South Atlantic Council held scoping meetings for Amendment 41 from January 25 to February 3, 2016. Meetings in Florida were held in conjunction with workshops conducted by the FWC. Public hearings were held via webinar on August 2, 2016, and in-person on August 15-17, 2016.

Summary of scoping comments:

- In general, the public felt that the current bag limit for mutton snapper (up to 10 within the snapper aggregate) is too high and favored a decrease in the bag limit. Opinions differed; however, as to how much of a decrease and whether it should be implemented year-round or only during the spawning season.
- Most people supported a decrease in the bag limit anywhere from 5 to 2 fish per person per day year round. Several supported 5 fish per person per day during regular season and 2 fish per person per day during spawning season but agreed that 3 fish per person per day year round would be simpler for fishermen and enforcement.
- There was some support for per vessel limits (10-12 per boat during spawning season) but the majority of commenters preferred per person limits.
- Suggestion of slot size in addition to the bag limit decrease. For instance, allow one fish over thirty-inches TL within the bag limit.
- Suggestion to remove mutton snapper from the 10 snapper aggregate.
- Some for-hire captains not in favor of reducing bag limit.

Summary of public hearing comments:

- Six commenters directly supported the 3 fish per person per day year-round bag limit
- Eleven commenters supported a decrease in the bag limit to 5 fish per person per day year round.
- There was some support for no retention during the spawning season.
- Commenters also expressed support for Alternative 1 (No Action) because, according to analyses, a change in the bag limit has no effect on restricting harvest.
- Some commenters supported a reduction in the bag limit as long as the size limit remains at 16 inches TL.
- Some support for a decrease in the bag limit to 2 fish per person per day year round
- Concern about recreational sales being very high under the current bag limit. A decrease in the bag limit would serve to curb this.
- Year-round bag limits are better for Florida because there are lots of vacationers and seasonal limits could affect their vacation plans.

5.7.5 South Atlantic Council's Conclusion

Stakeholders in the South Atlantic Region, particularly in South Florida, had requested that management agencies (state and federal) consider modifying the recreational bag limit for mutton snapper citing concerns about overexploitation of spawning aggregations each year during spring months. Indeed, during South Atlantic Council public input meetings and during workshops held by the Florida Fish and Wildlife Conservation Commission (FWC), there was strong support for a reduction in the bag limit. Although the immediate stated need was to protect spawning fish, the majority of stakeholders supported a reduction in the bag limit year-round instead of stricter measures during the spawning months. Since analyses conducted in support of this amendment indicated that the majority of recreational anglers are catching less than 5 mutton snapper per person and the FWC and stakeholders supported this alternative, the South Atlantic Council reasoned **Preferred Sub-alternative 4c** best meets the purpose to revise management measures for the mutton snapper component of the snapper grouper fishery based on the best scientific information available to achieve and maintain OY and to prevent overfishing while minimizing adverse social and economic effects. The preferred alternative also best meets the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.7.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The Vision Blueprint was approved in December 2015 and is intended to inform management of the snapper grouper fishery through 2020. As such, the Vision Blueprint serves as a “living document” to help guide future management, builds on stakeholder input and how the South Atlantic Council envisions future management of the fishery, guides the development of new amendments that address priority objectives and strategies, and illustrates actions that could be developed through the regular amendment process. The Vision Blueprint is organized into four strategic goal areas: (1) Science, (2) Management, (3) Communication, and (4) Governance. Each goal area has a set of objectives, strategies, and actions.

Action 7 to modify the recreational bag limits for mutton snapper in the South Atlantic Region responds to **Objective 2** under the broad Management goal to “*adopt management strategies for the snapper grouper fishery that rebuild and maintain fishery resources, adapt to regional differences in the fishery, and consider the social and economic needs of fishing communities.*” **Objective 2** aims to “*develop innovative management measures that allow consistent access to the fishery for all sectors*”. While bag limits do not constitute an innovative management approach, they continue to be an effective means to keep recreational landings within biologically acceptable limits and can be used to “spread out” the harvest over time to allow more consistent access to the resource. **Action 7** also addresses a priority action under **Strategy 2.1** (Support development of management approaches that address retention of snapper grouper species) to “*consider bag limit and trip limit adjustments.* Furthermore, under the broad Management goal, **Action 7** responds to Objective 2, Strategy 2.5 to *consider measures to simplify regulations for both sectors* since the South Atlantic Council worked closely with the

FWC to consider regulations that would be compatible in state and federal waters to simplify the regulatory environment to benefit resource users as well as law enforcement.

5.8 Action 8. Modify mutton snapper commercial trip limit in the South Atlantic Region

5.8.1 Snapper Grouper AP Comments and Recommendations

The Snapper Grouper AP discussed Amendment 41 during their April 26-27, 2016, meeting. At that time, actions in Amendment 41 were numbered differently and revisions have been made to the language of actions and alternatives in the amendment. Hence, the AP's motions may not reflect the chronology of actions/alternatives or the current language. The AP approved the following motion regarding modification of the commercial trip limit for mutton snapper in the South Atlantic.

MOTION: RECOMMEND ALTERNATIVE 1 AS PREFERRED UNDER ACTION 7

Action 7. Modify Mutton Snapper Commercial Trip Limit in the South Atlantic region

Alternative 1 (No Action). During May-June the commercial sector in the South Atlantic is restricted to 10 mutton snapper per day or 10 mutton snapper per trip, whichever is more restrictive, and sale is allowed. There is no trip limit for the commercial sector in the Gulf or South Atlantic from July through April.

5.8.2 Law Enforcement AP Comments and Recommendations

The Law Enforcement AP received a briefing on Amendment 41 during their March 7-8, 2016, meeting. The Law Enforcement AP had no comments or recommendations.

5.8.3 SSC Comments and Recommendations

During their May 3-5, 2016, meeting, the SSC received a summary document detailing actions and alternatives in Amendment 41 as well as preliminary analyses. Due to lack of time, the SSC did not discuss the amendment at that meeting. During their October 18-20, 2016, meeting, the SSC received a briefing on the analyses used to support management actions in Amendment 41. The SSC did not have any comments or recommendations.

*Alternatives**

1 (No Action). During May and June, each year, the possession of mutton snapper in or from the exclusive economic zone on board a vessel that has a commercial permit for South Atlantic snapper-grouper is limited to 10 per person per day or 10 per person per trip, whichever is more restrictive. There is no possession or trip limit for the commercial sector in the South Atlantic from January through April and July through December.

2. Establish a commercial trip limit for mutton snapper during the “regular season” (i.e., non-spawning months) in the South Atlantic.

- 2a. 300 pounds
- 2b. 400 pounds
- 2c. 500 pounds**

3. Specify a commercial trip limit for mutton snapper during the “spawning months” in the South Atlantic.

- 3a. 2 fish/person/day
- 3b. 3 fish/person/day
- 3c. 10 fish/vessel/day
- 3d. 12 fish/vessel/day
- 3e. No retention
- 3f. 5 fish/person/day**

* Preferred indicated in bold. Refer to Chapter 2 for detailed language of alternatives

5.8.4 Public Comments and Recommendations

The South Atlantic Council held scoping meetings for Amendment 41 from January 25 to February 3, 2016. Meetings in Florida were held in conjunction with workshops conducted by the FWC. Public hearings were held via webinar on August 2, 2016, and in-person on August 15-17, 2016.

Summary of scoping comments:

Support for commercial trip limit and similar restrictions to recreational sector during the spawning months. However, there was general agreement that mutton snapper are not targeted commercially in the South Atlantic.

Summary of public hearing comments:

- Two commenters spoke directly in support of a commercial trip limit of 500 pounds (lbs).
- Commercial fishermen in the Florida Keys do not catch 500 lbs of mutton snapper in one trip.
- Some support for vessel limits instead of per-person limits for commercial sector (suggestion of 10 to 15 fish per vessel).
- Two commenters supported a 5 fish per person per day during spawning months for commercial sector.
- Many commenters felt that proposed management measures for commercial sector are too restrictive, especially the possession limit during spawning months.
- Keep commercial and recreational regulations during spawning months the same. Since grouper open in May, commercial fishermen would like to be able to take more than 3 mutton per person. Also a lower possession limit in combination with the 25 lbs trip limit proposed for hogfish is going to affect some commercial fishermen.
- Several commenters expressed concern about discards.
- Because commercial industry is so accountable for their catch and current regulations allow sale of mutton snapper landed during May-June, there is support for maintaining the 10 fish per person per day possession limit during the spawning period.
- Dual permitted vessel holding commercial and charter head boat snapper grouper permits, it would only be allowed to have a maximum of four people aboard for a commercial trip. The per person/day rule gives some boats the advantage of bringing a larger “crew” out commercial fishing to retain more fish.
- Commercial sector has not reached its ACL since it was implemented so why consider restricting harvest?
- A 300 or 500 lbs trip limit is too high because mutton are not available in those quantities over the majority of the species range throughout the year or there are not that many participants.
- Consider requirement for recompression device for commercial sector and phase-in restrictions over time.

5.8.5 South Atlantic Council’s Conclusion

Regulations to limit commercial harvest of mutton snapper during May and June were initially implemented through Amendment 4 (SAFMC 1991) to protect mutton snapper spawning aggregations from overexploitation. However, data presented in **Section 4.8.1** indicate that commercial harvest has been highest, on average, during May and June from 2010 through 2014. The commercial sector is currently limited to 10 mutton snapper per person per day or 10 per person trip, whichever is more restrictive. However, since there are no restrictions on the number of crew on vessels holding a Federal unlimited commercial snapper grouper permit, it is probable that a commercial operation would seek to maximize its catch of mutton snapper during May and June by adding crew/passengers. To restrict commercial harvest during this critical part of the year for mutton snapper and to ensure compatibility with proposed regulations for the recreational sector, the South Atlantic Council proposes to reduce the trip limit to 5 fish per person per day (or 5 per person per trip, whichever is most restrictive) during the designated “spawning months” (April through June). The Florida Fish and Wildlife Conservation Commission (FWC) is also adopting this change in regulations for mutton snapper in state waters. Moreover, the FWC indicated a trip limit during the remainder of the year was also warranted in order to control expansion to a level that would maintain commercial harvest open year round. Input obtained during public workshops indicated that some commercial fishermen may switch from harvesting hogfish to targeting mutton, since the commercial trip limit for hogfish in Federal waters off Florida is being set at 25 pounds whole weight (Amendment 37, under review). The South Atlantic Council reasoned **Preferred Sub-alternative 2c** and **Preferred Sub-alternative 3f** best meet the purpose to revise management measures for the mutton snapper component of the snapper grouper fishery based on the best scientific information available to achieve and maintain OY and to prevent overfishing while minimizing adverse social and economic effects. The preferred alternatives also best meet the objectives of the Snapper Grouper FMP, as amended, while complying with the requirements of the Magnuson-Stevens Act and other applicable law.

5.8.6 How is this Action Addressing the Vision Blueprint for the Snapper Grouper Fishery?

The Vision Blueprint was approved in December 2015 and is intended to inform management of the snapper grouper fishery through 2020. As such, the Vision Blueprint serves as a “living document” to help guide future management, builds on stakeholder input and how the South Atlantic Council envisions future management of the fishery, guides the development of new amendments that address priority objectives and strategies, and illustrates actions that could be developed through the regular amendment process. The Vision Blueprint is organized into four strategic goal areas: (1) Science, (2) Management, (3) Communication, and (4) Governance. Each goal area has a set of objectives, strategies, and actions.

Action 8 to modify the mutton snapper commercial trip limit in the South Atlantic Region responds to **Objective 2** under the broad Management goal to “*adopt management strategies for the snapper grouper fishery that rebuild and maintain fishery resources, adapt to regional differences in the fishery, and consider the social and economic needs of fishing communities.*” **Objective 2** aims to “*develop innovative management measures that allow consistent access to the fishery for all sectors*”. While trip limits do not constitute an innovative management approach, they continue to be an effective means to keep commercial landings within biologically acceptable limits and can be used to “spread out” the harvest over time to allow more consistent access to the resource. **Action 8** also addresses a priority action under **Strategy 2.1** (Support development of management approaches that address retention of snapper grouper species) to *consider bag limit and trip limit adjustments*. Furthermore, under the broad Management goal, **Action 8** responds to Objective 2, Strategy 2.5 to *consider measures to simplify regulations for both sectors* since the South Atlantic Council worked closely with the FWC to consider regulations that would be compatible in state and federal waters to simplify the regulatory environment to benefit resource users as well as law enforcement.

Chapter 6. Cumulative Effects

6.1 Affected Area

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**. For the actions found in Amendment 41, the cumulative effects analysis (CEA) includes an analysis of data from 2014 onwards through what is expected to take place approximately before or within 2016-2018.

6.2 Past, Present, and Reasonably Foreseeable Actions Impacting the Affected Area

Fishery managers implemented the first significant regulations pertaining to mutton snapper in 1991 through Amendment 4 to the Snapper Grouper FMP (SAFMC 1991). The regulations included a 12-inch total length minimum size limit for mutton snapper and limited harvest during spawning season. Listed below 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 and socio-economic environment. The complete history of management of the snapper grouper fishery can be found in **Appendix C (History of Management)**.

Past Actions

The South Atlantic Headboat Reporting Amendment was implemented on January 27, 2014, and requires that all federally-permitted headboats on the South Atlantic report their landings information electronically, and on a weekly basis in order to improve the timeliness and accuracy of harvest data.

The Generic Dealer Reporting Amendment, which became effective on August 7, 2014, established one dealer permit for the Gulf of Mexico and South Atlantic regions and increased the reporting frequency requirements for species managed by the Gulf of Mexico and South Atlantic Councils. This amendment is expected to improve fisheries data collection, through more timely and accurate dealer reporting, and streamline the dealer permit system.

Amendment 29 to the Snapper Grouper FMP, which became effective on July 1, 2015, updated the South Atlantic Council's acceptable biological catch (ABC) control rule to incorporate methodology for determining the ABC of "Only Reliable Catch Stocks"; (2) adjusted

ABCs for the affected unassessed species; (3) specified annual catch limits (ACLs) for 7 species based on the updated ABCs; and (4) modified management measures for gray triggerfish in federal waters of the South Atlantic region.

The Generic Accountability Measures (AM) and Dolphin Allocation Amendment, in part, modified AMs for snapper grouper species (including mutton snapper) to make them more consistent with AMs already implemented for other species and other fishery management plans. The regulations became effective on February 22, 2016.

Present Actions

Amendment 36 to the Snapper Grouper FMP would establish new Spawning Special Management Zones to protect spawning areas for snapper grouper species.

Amendment 37 to the Snapper Grouper FMP would modify the hogfish fishery management unit, specify fishing levels for the two South Atlantic hogfish stocks, establish a rebuilding plan for the Florida Keys/East Florida stock, and establish/revise management measures for both hogfish stocks in the South Atlantic Region, such as size limits, recreational bag limits, and commercial trip limits.

Reasonably Foreseeable Future Actions

The Vision Blueprint Recreational Amendment for the Snapper Grouper Fishery of the South Atlantic considers actions to evaluate and modify the composition of the recreational aggregate snapper bag limit, recreational aggregate grouper bag limit, and the recreational aggregate for species without a bag limit. The amendment would also consider modifying the current recreational prohibition on harvest and possession of shallow water groupers, remove the recreational minimum size limit for deepwater species, and modify the recreational minimum size limit for black sea bass.

The Vision Blueprint Commercial Amendment for the Snapper Grouper Fishery of the South Atlantic is currently under development.

The Bycatch Reporting Amendment contains an action to improve bycatch reporting for the snapper grouper fishery.

A Joint Commercial Logbook Reporting Amendment would require electronic reporting of logbook information by federally-permitted vessels.

The Joint Charter Boat Reporting Amendment would require charter vessels to regularly report their landings information electronically. Including charter boats in the recreational harvest reporting system would further improve the agency's ability to monitor recreational catch rates in-season.

Expected Impacts from Past, Present, and Future Actions

Actions in Amendment 41 that address the mutton snapper segment of the snapper grouper fishery, together or separately, are not expected to result in significant cumulative adverse biological or socio-economic effects. All of the proposed, or recently implemented management actions affecting mutton snapper within the snapper grouper fishery, are intended to improve management of the snapper grouper resource, while minimizing, to the maximum extent practicable, adverse social and economic impacts.

The effects of the actions (revise the ACL and optimum yield, revise the recreational annual catch target, designate spawning months, increase the minimum size limit, modify the recreational bag limit and the commercial trip limit for the mutton snapper component of the snapper grouper fishery) would limit fishing opportunities to mutton snapper in the South Atlantic region in the short-term. However, in general, biological and socio-economic benefits would result from limiting harvest over time. Improved stock health would be associated with more fish being available for harvest, which would subsequently improve prospects for sustained participation in the respective fisheries to fishermen and coastal communities. **Section 3.3** describes the communities and fishermen who may be affected by actions in Amendment 41.

When combined with the impacts of past, present, and future actions affecting the snapper grouper fishery, specifically mutton snapper, minor cumulative impacts are likely to accrue, such as increased management control for designated fishing zones, and socioeconomic benefits associated with improved management strategies. The South Atlantic Council amendments intended to increase the frequency of reporting by dealers and fishermen are likely to benefit the human environment through more timely biological protections and unnecessary delay in data availability, leading to more stable market conditions. Therefore, the likely cumulative socioeconomic effects would be improved commercial and recreational fishing opportunities, and benefits to associated businesses and communities.

6.3 Consideration of Climate Change and Other Non-Fishery Related Issues

Climate Change

Global climate changes could have significant effects on South Atlantic fisheries, though the extent of these effects on the snapper grouper fishery is not known at this time. The Environmental Protection Agency's climate change webpage (<https://www.epa.gov/climate-indicators/marine-species-distribution>), and NOAA's Office of Science and Technology climate webpage (<https://www.st.nmfs.noaa.gov/ecosystems/climate/index>), provides background information on climate change, including indicators which measure or anticipate effects on oceans, weather and climate, ecosystems, health and society, and greenhouse gases. The United Nations Intergovernmental Panel on Climate Change's Fifth Assessment Report also provides a compilation of scientific information on climate change (November 2, 2014). Those findings are summarized below.

Ocean acidification, or a decrease in surface ocean pH due to absorption of anthropogenic carbon dioxide emissions, affects the chemistry and temperature of the water. Increased thermal stratification alters ocean circulation patterns, and causes a loss of sea ice, sea level rise, increased wave height and frequency, reduced upwelling, and changes in precipitation and wind patterns. Changes in coastal and marine ecosystems can influence organism metabolism and alter ecological processes such as productivity, species interactions, migration, range and distribution, larval and juvenile survival, prey availability, and susceptibility to predators. The “center of biomass,” a geographical representation of each species’ weight distribution, is being used to identify the shifting of fish populations. Warming sea temperature trends in the southeast have been documented, and animals must migrate to cooler waters, if possible, if water temperatures exceed survivable ranges (Needham et al. 2012). Harvesting and habitat changes also cause geographic population shifts. Changes in water temperatures may also affect the distribution of native and exotic species, allowing invasive species to establish communities in areas they may not have been able to survive previously. The combination of warmer water and expansion of salt marshes inland with sea-level rise may increase productivity of estuarine-dependent species in the short term. However, in the long term, this increased productivity may be temporary because of loss of fishery habitats due to wetland loss (Kennedy et al. 2002). The numerous changes to the marine ecosystem may cause an increased risk of disease in marina biota. An increase in the occurrence and intensity of toxic algae blooms will negatively influence the productivity of keystone animals, such as corals, and critical coastal ecosystems such as wetlands, estuaries, and coral reefs (IPCC 2014; Kennedy et al. 2002).

Climate change may 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. In the near term, it is unlikely that the management measures contained in Amendment 41 would compound or exacerbate the ongoing effects of climate change on snapper grouper species.

Weather Variables

Hurricane season is from June 1 to November 30, and accounts for 97% of all tropical activity affecting the Atlantic basin. These storms, although unpredictable in their annual occurrence, can devastate areas when they occur. Although these effects may be temporary, those fishing-related businesses whose profitability is marginal may go out of business if a hurricane strikes.

Deepwater-Horizon Oil Spill

On April 20, 2010, an explosion occurred on the Deepwater Horizon MC252 oil rig, resulting in the release of an estimated 4.9 million barrels of oil into the Gulf of Mexico (Gulf). In addition, 1.84 million gallons of Corexit 9500A dispersant were applied as part of the effort to constrain the spill. The cumulative effects from the oil spill and response may not be known for several years. The oil spill affected more than one-third of the Gulf area from western Louisiana east to the panhandle of Florida and south to the Campeche Bank in Mexico. The impacts of the

Deepwater Horizon MC252 oil spill on the physical environment are expected to be significant and may be long-term. Oil is dispersed on the surface, and because of the heavy use of dispersants, oil is also documented as being suspended within the water column, some even deeper than the location of the broken well head. Floating and suspended oil washed onto shore in several areas of the Gulf, as well as non-floating tar balls. Whereas suspended and floating oil degrades over time, tar balls are more persistent in the environment and can be transported hundreds of miles. Oil on the surface of the water could restrict the normal process of atmospheric oxygen mixing into and replenishing oxygen concentrations in the water column. In addition, microbes in the water that break down oil and dispersant also consume oxygen; this could lead to further oxygen depletion. Zooplankton that feed on algae could also be negatively impacted, thus allowing more of the hypoxia-fueling algae to grow. The highest concern is that the oil spill may have impacted spawning success of species that spawn in the summer months, either by reducing spawning activity or by reducing survival of the eggs and larvae. Effects on the physical environment, such as low oxygen, could lead to impacts on the ability of larvae and post-larvae to survive, even if they never encounter oil. In addition, effects of oil exposure may create sub-lethal effects on the eggs, larva, and early life stages. The stressors could potentially be additive, and each stressor may increase the susceptibility to the harmful effects of the other. The oil from the spill site was not detected in the South Atlantic region, and does not likely pose a threat to the South Atlantic species addressed in this amendment. However, the effects of the oil spill on fish species would be taken into consideration in future Southeast Data Assessment and Review assessments. Indirect and inter-related effects on the biological and ecological environment of the fisheries in concert with the Deepwater Horizon MC252 oil spill are not well understood. Changes in the population size structure could result from shifting fishing effort to specific geographic segments of populations, combined with any anthropogenically induced natural mortality that may occur from the impacts of the oil spill. The impacts on the food web from phytoplankton, to zooplankton, to mollusks, to top predators may be significant in the future.

6.4 Overall Impacts Expected from Past, Present, and Future Actions

The proposed management actions are summarized in **Chapter 2** of this document. Detailed discussions of the magnitude and significance of the impacts of the preferred alternatives on the human environment appear in **Chapter 4** of this document. None of the impacts of the actions in this amendment, in combination with past, present, and future actions have been determined to be significant. Although several other management actions, in addition to this amendment, are expected to affect snapper grouper, including mutton snapper, any additive effects, beneficial and adverse, are not expected to result in a significant level of cumulative impacts.

The proposed actions 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 are not expected to result in appreciable changes to current fishing practices. Additionally, the proposed action is not likely to change the way in which the snapper grouper fishery is prosecuted; therefore, the actions are not expected to result in adverse impacts on health or human safety beyond the status quo.

6.5 Monitoring and Mitigation

The effects of the proposed actions are, and will continue to be, monitored through collection of landings data by the Florida Fish and Wildlife Conservation Commission for mutton snapper. The National Marine Fisheries Service will continue to monitor and collect information on mutton snapper for stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. The proposed actions relate to the harvest of indigenous species in the Atlantic, and the activities/regulations being altered do not introduce non-indigenous species, and are not reasonably expected to facilitate the spread of such species through depressing the populations of native species. Additionally, this amendment does not propose any activity, such as increased ballast water discharge from foreign vessels, which is associated with the introduction or spread on non-indigenous species.

Chapter 7. List of Interdisciplinary Plan Team (IPT) Members

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Mark Fields	SERO/OLE	Criminal Investigator
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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

Chapter 8. Agencies and Persons Consulted

Responsible Agency

South Atlantic

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NMFS, Southeast Region
263 13th Avenue South
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Environmental Assessment:

List of Agencies, Organizations, and Persons Consulted

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

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Appendix A. Considered But Rejected Alternatives

Action 6. Modify Mutton Snapper Recreational Bag Limit in the South Atlantic

Alternative 3. Retain mutton snapper within the recreational 10 snapper aggregate bag limit in the South Atlantic, but specify bag/vessel limits for mutton snapper during the “spawning months”

Sub-alternative 3b. 2 fish/vessel/day

Sub-alternative 3c. 5 fish/vessel/day

Discussion: The Council did not consider the above sub-alternatives for vessel limits for the recreational sector because there was no support from the public and the measures were deemed too restrictive.

Action 7. Modify Mutton Snapper Commercial Trip Limit in the South Atlantic

Alternative 3. Specify a commercial trip limit for mutton snapper during the “spawning months” in the South Atlantic.

Sub-alternative 3b. 5 fish/person/day

Sub-alternative 3c. 2 fish/vessel/day

Sub-alternative 3d. 5 fish/vessel/day

Discussion: The Council removed the sub-alternatives above from consideration for the commercial sector in order to be consistent with alternatives being considered for the recreational sector and because the measures were too restrictive.

Appendix B. Glossary

Allowable Biological Catch (ABC): Maximum amount of fish stock than can be harvested without adversely affecting recruitment of other components of the stock. The ABC level is typically higher than the total allowable catch, leaving a buffer between the two.

ALS: Accumulative Landings System. NMFS database which contains commercial landings reported by dealers.

Biomass: Amount or mass of some organism, such as fish.

B_{MSY}: Biomass of population achieved in long-term by fishing at F_{MSY} .

Bycatch: Fish harvested in a fishery, but not sold or kept for personal use. Bycatch includes economic discards and regulatory discards, but not fish released alive under a recreational catch and release fishery management program.

Caribbean Fishery Management Council (CFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The CFMC develops fishery management plans for fisheries off the coast of the U.S. Virgin Islands and the Commonwealth of Puerto Rico.

Catch Per Unit Effort (CPUE): The amount of fish captured with an amount of effort. CPUE can be expressed as weight of fish captured per fishing trip, per hour spent at sea, or through other standardized measures.

Charter Boat: A fishing boat available for hire by recreational anglers, normally by a group of anglers for a short time period.

Cohort: Fish born in a given year. (See year class.)

Control Date: Date established for defining the pool of potential participants in a given management program. Control dates can establish a range of years during which a potential participant must have been active in a fishery to qualify for a quota share.

Constant Catch Rebuilding Strategy: A rebuilding strategy where the allowable biological catch of an overfished species is held constant until stock biomass reaches B_{MSY} at the end of the rebuilding period.

Constant F Rebuilding Strategy: A rebuilding strategy where the fishing mortality of an overfished species is held constant until stock biomass reached B_{MSY} at the end of the rebuilding period.

Directed Fishery: Fishing directed at a certain species or species group.

Discards: Fish captured, but released at sea.

Discard Mortality Rate: The % of total fish discarded that do not survive being captured and released at sea.

Derby: Fishery in which the TAC is fixed and participants in the fishery do not have individual quotas. The fishery is closed once the TAC is reached, and participants attempt to maximize their harvests as quickly as possible. Derby fisheries can result in capital stuffing and a race for fish.

Effort: The amount of time and fishing power (i.e., gear size, boat size, horsepower) used to harvest fish.

Exclusive Economic Zone (EEZ): Zone extending from the shoreline out to 200 nautical miles in which the country owning the shoreline has the exclusive right to conduct certain activities such as fishing. In the United States, the EEZ is split into state waters (typically from the shoreline out to 3 nautical miles) and federal waters (typically from 3 to 200 nautical miles).

Exploitation Rate: Amount of fish harvested from a stock relative to the size of the stock, often expressed as a percentage.

F: Fishing mortality.

Fecundity: A measurement of the egg-producing ability of fish at certain sizes and ages.

Fishery Dependent Data: Fishery data collected and reported by fishermen and dealers.

Fishery Independent Data: Fishery data collected and reported by scientists who catch the fish themselves.

Fishery Management Plan: Management plan for fisheries operating in the federal produced by regional fishery management councils and submitted to the Secretary of Commerce for approval.

Fishing Effort: Usually refers to the amount of fishing. May refer to the number of fishing vessels, amount of fishing gear (nets, traps, hooks), or total amount of time vessels and gear are actively engaged in fishing.

Fishing Mortality: A measurement of the rate at which fish are removed from a population by fishing. Fishing mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Fishing Power: Measure of the relative ability of a fishing vessel, its gear, and its crew to catch fishes, in reference to some standard vessel, given both vessels are under identical conditions.

F_{30%SPR}: Fishing mortality that will produce a static SPR = 30%.

F_{45%SPR}: Fishing mortality that will produce a static SPR = 45%.

F_{OY}: Fishing mortality that will produce OY under equilibrium conditions and a corresponding biomass of B_{OY}. Usually expressed as the yield at 85% of F_{MSY}, yield at 75% of F_{MSY}, or yield at 65% of F_{MSY}.

F_{MSY}: Fishing mortality that if applied constantly, would achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}.

Fork Length (FL): The length of a fish as measured from the tip of its snout to the fork in its tail.

Framework: An established procedure within a fishery management plan that has been approved and implemented by NMFS, which allows specific management measures to be modified via regulatory amendment.

Gear restrictions: Limits placed on the type, amount, number, or techniques allowed for a given type of fishing gear.

Growth Overfishing: When fishing pressure on small fish prevents the fishery from producing the maximum poundage. Condition in which the total weight of the harvest from a fishery is improved when fishing effort is reduced, due to an increase in the average weight of fishes.

Gulf of Mexico Fishery Management Council (GFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The GFMC develops fishery management plans for fisheries off the coast of Texas, Louisiana, Mississippi, Alabama, and the west coast of Florida.

Headboat: A fishing boat that charges individual fees per recreational angler onboard.

Highgrading: Form of selective sorting of fishes in which higher value, more marketable fishes are retained, and less marketable fishes, which could legally be retained are discarded.

Individual Fishing Quota (IFQ): Fishery management tool that allocates a certain portion of the TAC to individual vessels, fishermen, or other eligible recipients.

Longline: Fishing method using a horizontal mainline to which weights and baited hooks are attached at regular intervals. Gear is either fished on the bottom or in the water column.

Magnuson-Stevens Fishery Conservation and Management Act: Federal legislation responsible for establishing the fishery management councils and the mandatory and discretionary guidelines for federal fishery management plans.

Marine Recreational Information Program (MRIP): Survey operated by NMFS in cooperation with states that collects marine recreational data.

Maximum Fishing Mortality Threshold (MFMT): The rate of fishing mortality above which a stock's capacity to produce MSY would be jeopardized.

Maximum Sustainable Yield (MSY): The largest long-term average catch that can be taken continuously (sustained) from a stock or stock complex under average environmental conditions.

Minimum Stock Size Threshold (MSST): The biomass level below which a stock would be considered overfished.

Modified F Rebuilding Strategy: A rebuilding strategy where fishing mortality is changed as stock biomass increases during the rebuilding period.

Multispecies fishery: Fishery in which more than one species is caught at the same time and location with a particular gear type.

National Marine Fisheries Service (NMFS): Federal agency within NOAA responsible for overseeing fisheries science and regulation.

National Oceanic and Atmospheric Administration: Agency within the Department of Commerce responsible for ocean and coastal management.

Natural Mortality (M): A measurement of the rate at which fish are removed from a population by natural causes. Natural mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Optimum Yield (OY): The amount of catch that will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

Overfished: A stock or stock complex is considered overfished when stock biomass falls below the minimum stock size threshold (MSST) (e.g., current biomass < MSST = overfished).

Overfishing: Overfishing occurs when a stock or stock complex is subjected to a rate of fishing mortality that exceeds the maximum fishing mortality threshold (e.g., current fishing mortality rate > MFMT = overfishing).

Quota: % or annual amount of fish that can be harvested.

Recruitment (R): Number or percentage of fish that survives from hatching to a specific size or age.

Recruitment Overfishing: The rate of fishing above which the recruitment to the exploitable stock becomes significantly reduced. This is characterized by a greatly reduced spawning stock,

a decreasing proportion of older fish in the catch, and generally very low recruitment year after year.

Scientific and Statistical Committee (SSC): Fishery management advisory body composed of federal, state, and academic scientists, which provides scientific advice to a fishery management council.

Selectivity: The ability of a type of gear to catch a certain size or species of fish.

South Atlantic Fisheries Management Council (SAFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The SAFMC develops fishery management plans for fisheries off North Carolina, South Carolina, Georgia, and the east coast of Florida.

Spawning Potential Ratio (Transitional SPR): Formerly used in overfished definition. The number of eggs that could be produced by an average recruit in a fished stock divided by the number of eggs that could be produced by an average recruit in an unfished stock. SPR can also be expressed as the spawning stock biomass per recruit (SSBR) of a fished stock divided by the SSBR of the stock before it was fished.

% Spawning Per Recruit (Static SPR): Formerly used in overfishing determination. The maximum spawning per recruit produced in a fished stock divided by the maximum spawning per recruit, which occurs under the conditions of no fishing. Commonly abbreviated as %SPR.

Spawning Stock Biomass (SSB): The total weight of those fish in a stock which are old enough to spawn.

Spawning Stock Biomass Per Recruit (SSBR): The spawning stock biomass divided by the number of recruits to the stock or how much spawning biomass an average recruit would be expected to produce.

Total Allowable Catch (TAC): The total amount of fish to be taken annually from a stock or stock complex. This may be a portion of the Allowable Biological Catch (ABC) that takes into consideration factors such as bycatch.

Total Length (TL): The length of a fish as measured from the tip of the snout to the tip of the tail.

Appendix C. History of Management

South Atlantic Snapper Grouper History of Management

Last Updated: 12/16/16

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 Snapper Grouper Fishery Management Plan (FMP), as well as some events not covered in amendment actions.

*Shaded rows indicate FMP Amendments

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" 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, NC and north of Cape Canaveral, FL; -Directed fishery defined as vessel with trawl gear and ≥200 lb s-g on board; -Established rebuttable assumption that vessel with s-g on board had harvested such fish in the 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.
Emergency Rule	8/3/90	55 FR 32257	-Added wreckfish to the fishery management unit (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.
Notice of Control Date	09/24/90	55 FR 39039	-Anyone entering federal wreckfish fishery in the EEZ off S. Atlantic states after 09/24/90 was not assured of future access if limited entry program developed.
Regulatory Amendment #3 (1989)	11/02/90	PR: 55 FR 28066 FR: 55 FR 40394	-Established artificial reef at Key Biscayne, FL as SMZ; -Fish trapping, bottom longlining, spear fishing, and harvesting of Goliath grouper prohibited in SMZ.

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 #2 (1990a)	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.
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 (OY) and overfishing; -Required permit to fish for, land or sell wreckfish; -Required catch and effort reports from selected, permitted vessel; -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 S. Atlantic states after 07/30/91 was not assured of future access if limited entry program developed.
Amendment #4 (1991)	01/01/92	PR: 56 FR 29922 FR: 56 FR 56016	-Prohibited gear: fish traps except black sea bass traps north of Cape Canaveral, FL; entanglement nets; longline gear inside 50 fathoms; bottom longlines to harvest wreckfish; powerheads and bangsticks in designated SMZs off S. Carolina. -Defined overfishing/overfished and established rebuilding timeframe: red snapper and groupers ≤ 15 years (year 1 = 1991); other snappers, greater amberjack, black sea bass, red porgy ≤ 10 years (year 1 = 1991); -Required permits (commercial & for-hire) and specified data collection regulations; -Established an assessment group and annual adjustment procedure (framework); -Permit, gear, and vessel id requirements specified for black sea bass traps; -No retention of snapper grouper spp. caught in other fisheries with gear prohibited in snapper grouper fishery if captured snapper grouper had no bag limit or harvest was prohibited. If had a bag limit, could retain only the bag limit; -8" TL limit – lane snapper; -10" TL limit – vermilion snapper (recreational only); -12" TL limit – red porgy, vermilion snapper (commercial only), gray, yellowtail, mutton,

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.
			<p>schoolmaster, queen, blackfin, cubera, dog, mahogany, and silk snappers;</p> <ul style="list-style-type: none"> -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.
Amendment #5 (1992a)	04/06/92	PR: 56 FR 57302 FR: 57 FR 7886	<p>For wreckfish:</p> <ul style="list-style-type: none"> -Established limited entry system with individual transferable quotas (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	<p>For Black Sea Bass (bsb):</p> <ul style="list-style-type: none"> -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	<p>For Black Sea Bass:</p> <ul style="list-style-type: none"> -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	<p>-For Black Sea Bass:</p> <ul style="list-style-type: none"> -Modified definition of bsb pot; -Allowed multi-gear trips for bsb; -Allowed retention of incidentally-caught fish on bsb trips.

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 #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 <i>Oculina</i> 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 NC; -Added localized overfishing to list of problems and objectives; -Adjusted bag limit and crew specs. for charter and head boats; -Modified management unit for scup to apply south of Cape Hatteras, NC; -Modified framework procedure.
Regulatory Amendment #6 (1994b)	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 black sea bass pot fishery off South Atlantic states after 04/23/97 was not assured of future access if limited entry program developed.
Interim Rule Request	1/16/98		-The South Atlantic Fishery Management Council (Council) requested all Amendment 9 measures except black sea bass pot construction changes be implemented as an interim request under the Magnuson-Stevens 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.
Amendment #8	12/14/98	PR: 63 FR 1813 FR: 63 FR 38298	-Established program to limit initial eligibility for snapper grouper fishery:

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(1997)			<ul style="list-style-type: none"> -Must have demonstrated landings of any species in the 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 \geq 1,000 pounds (lb) 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 the Council's 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.
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.
Regulatory Amendment #7 (1998a)	01/29/99	PR: 63 FR 43656 FR: 63 FR 71793	-Established 10 SMZs at artificial reefs off South Carolina.

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Amendment #9 (1998b)	2/24/99	PR: 63 FR 63276 FR: 64 FR 3624	<ul style="list-style-type: none"> -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 rec. bag limit; no harvest or possession > bag limit, and no purchase or sale, during April; quota = 1,169,931 lb; began fishing year May 1; prohibited coring; -Specified size limits for several snapper grouper species (indicated in parentheses in inches TL): including yellowtail snapper (12), mutton snapper (16), red snapper (20); red grouper, yellowfin grouper, yellowmouth grouper, and scamp (20) ; -Vermilion snapper: 11" TL (recreational), 12" TL commercial; -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.
Emergency Action	9/3/99	64 FR 48326	-Reopened the Amendment 8 permit application process.
Emergency Interim Rule	09/08/99, expired 08/28/00	64 FR 48324 and 65 FR 10040	-Prohibited harvest or possession of red porgy.
Amendment #10 Comprehensive Essential Fish Habitat Amendment (1998c)	07/14/00	PR: 64 FR 37082 and 64 FR 59152 FR: 65 FR 37292	-Identified essential fish habitat (EFH) and established habitat areas of particular concern (HAPC) for species in the snapper grouper FMU.

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Amendment #11 Comprehensive Sustainable Fisheries Act Amendment (1998d)	12/02/99	PR: 64 FR 27952 FR: 64 FR 59126	<p>-Maximum sustainable yield (MSY) proxy: goliath and Nassau grouper = 40% static spawning potential ratio (SPR); all other species = 30% static SPR;</p> <p>-OY: hermaphroditic groupers = 45% static SPR; goliath and Nassau grouper = 50% static SPR; all other species = 40% static SPR</p> <p>-Overfished/overfishing evaluations: BSB: overfished (minimum stock size threshold (MSST)=3.72 mp, 1995 biomass=1.33 mp); undergoing overfishing (maximum fishing mortality threshold (MFMT)=0.72, F1991-1995=0.95) Vermilion snapper: overfished (static SPR = 21-27%) Red pogy: 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)</p> <p>-overfishing level: goliath and Nassau grouper = $F > F_{40\%}$ static SPR; all other species: = $F > F_{30\%}$ static SPR</p> <p>Approved definitions for overfished and overfishing. MSST = $[(1-M) \text{ or } 0.5 \text{ whichever is greater}] * B_{MSY}$. MFMT = F_{MSY}.</p>
Amendment #12 (2000a)	09/22/00	PR: 65 FR 35877 FR: 65 FR 51248	<p>For Red pogy: -MSY=4.38 mp; OY=45% static SPR; MFMT=0.43; MSST=7.34 mp; rebuilding timeframe=18 years (1999=year 1); -no sale of red pogy during Jan-April; -1 fish bag limit; -50 lb. bycatch commercial trip limit May-December; -Modified management options and list of possible framework actions.</p>
Regulatory Amendment #8 (2000b)	11/15/00	PR: 65 FR 41041 FR: 65 FR 61114	<p>-Established 12 SMZs at artificial reefs off Georgia; revised boundaries of 7 existing SMZs off Georgia to meet CG permit specs; restricted fishing in new and revised SMZs.</p>

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Amendment #9 (1998b) resubmitted	10/13/00	PR: 63 FR 63276 FR: 65 FR 55203	-Commercial trip limit for greater amberjack.
Amendment #13A (2003)	04/26/04	PR: 68 FR 66069 FR: 69 FR 15731	-Extended for an indefinite period the regulation prohibiting fishing for and possessing snapper grouper species within the <i>Oculina</i> Experimental Closed Area.
Notice of Control Date	10/14/05	70 FR 60058	-Considered 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	<p>-End overfishing of snowy grouper, vermilion snapper, black sea bass, and golden tilefish. Increase allowable catch of red porgy. Year 1 = 2006;</p> <p>1. <u>Snowy Grouper</u> Commercial: -Quota = 151,000 lb gutted weight (gw) in year 1, 118,000 lb gw in year 2, and 84,000 lb gw in year 3 onwards. -Trip limit = 275 lb gw in year 1, 175 lb gw in year 2, and 100 lb gw in year 3 onwards; Recreational: -Limit possession to one snowy grouper in 5 grouper per person/day aggregate bag limit;</p> <p>2. <u>Golden Tilefish</u> Commercial: Quota of 295,000 lb gw, 4,000 lb gw trip limit until 75% of the quota is taken when the trip limit is reduced to 300 lb gw. Do not adjust the trip limit downwards unless 75% is captured on or before September 1; Recreational: Limited possession to 1 golden tilefish in 5 grouper per person/day aggregate bag limit;</p> <p>3. <u>Vermilion Snapper</u> Commercial: Quota of 1,100,000 lb gw; Recreational: 12" TL size limit.</p> <p>4. <u>Black Sea Bass</u> Commercial: Quota of 477,000 lb gw in year 1, 423,000 lb gw in year 2, and 309,000 lb gw in year 3 onwards; -Required 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; -Required black sea bass pots be removed from the water when the quota is met; -Changed fishing year from calendar year to June 1 – May 31; Recreational: Recreational allocation of 633,000 lb gw in year 1, 560,000 lb gw in year 2, and 409,000 lb</p>

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			<p>gw in year 3 onwards. Increase minimum size limit from 10” to 11” in year 1 and to 12” in year 2; -Reduced recreational bag limit from 20 to 15 per person per day; -Changed fishing year from the calendar year to June 1 through May 31.</p> <p>5. <u>Red Porgy</u> Commercial and recreational: -Retained 14” TL size limit and seasonal closure (retention limited to the bag limit); -Specified a commercial quota of 127,000 lb 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; -Increased commercial trip limit from 50 lb ww to 120 red porgy (210 lb gw) during May through December;--Increased recreational bag limit from one to three red porgy per person per day.</p>
Notice of Control Date	3/8/07	72 FR 60794	-Considered 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	-Established 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	- Established rebuilding plans and status determination criteria for snowy grouper, black sea bass, and red porgy.
Notice of Control Date	12/4/08	74 FR 7849	-Established a control date for the golden tilefish portion of the snapper grouper fishery in the South Atlantic.
Notice of Control Date	12/4/08	74 FR 7849	-Established control date for black sea bass pot sector in the South Atlantic.
Amendment #15B (2008b)	2/15/10	PR: 74 FR 30569 FR: 74 FR 58902	<p>-Prohibited the sale of snapper-grouper harvested or possessed in the EEZ under the bag limits and prohibited the sale of snapper-grouper harvested or possessed under the bag limits by vessels with a Federal charter vessel/headboat permit for South Atlantic snapper-grouper were harvested; -Reduced the effects of incidental hooking on sea turtles and smalltooth sawfish; -Adjusted commercial permit renewal periods and transferability requirements; -Revised the management reference points for golden tilefish; -Implemented plan to monitor and assess bycatch; -Required a vessel that fished in the EEZ, if selected by NMFS, to carry an observer and install electronic logbook and/or video monitoring equipment provided by NMFS; -Established reference points for golden tilefish;</p>

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			<ul style="list-style-type: none"> -Established allocations for snowy grouper (95% commercial & 5% recreational); -Established allocations for red porgy (50% commercial & 50% recreational).
Amendment #16 (2009a)	7/29/09	PR: 74 FR 6297 FR: 74 FR 30964	<ul style="list-style-type: none"> -Specified status determination criteria for gag and vermilion snapper; For gag: <ul style="list-style-type: none"> -Specified interim allocations 51% commercial & 49% recreational; -Recreational and commercial shallow water grouper spawning closure January through April; -Directed commercial quota= 352,940 lb gw; -Reduced 5-fish aggregate grouper bag limit, including tilefish species, to a 3-fish aggregate; -Captain and crew on for-hire trips cannot retain the bag limit of vermilion snapper and species within the 3-fish grouper aggregate; For vermilion snapper: <ul style="list-style-type: none"> -Specified interim allocations 68% commercial & 32% recreational; -Directed commercial quota split Jan-June=315,523 lb gw and 302,523 lb gw July-Dec; -Reduced bag limit from 10 to 4 and a recreational closed season November through March; -Required venting and dehooking tools when catching snapper grouper species to reduce recreational and commercial bycatch mortality.
Amendment #19 Comprehensive Ecosystem-Based Amendment 1 (CE-BA1) (2009b)	7/22/10	PR: 75 FR 14548 FR: 75 FR 35330	<ul style="list-style-type: none"> -Amended coral, coral reefs, and live/hardbottom habitat FMP to establish deepwater coral HAPCs; -Created a “shrimp fishery access area” (SFAA) within the Stetson-Miami Terrace CHAPC boundaries; -Created allowable “golden crab fishing areas” with the Stetson-Miami Terrace CHAPC and Pourtales Terrace CHAPC boundaries; -Amended the golden crab FMP to require vessel monitoring.
Amendment #17A	12/3/10 red snapper closure; circle	PR: 75 FR 49447 FR: 75 FR 76874	<ul style="list-style-type: none"> -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

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(2010a)	hooks 3/3/2011		Atlantic EEZ; -Specified an annual catch limit (ACL) and an accountability measure (AM) for red snapper with management measures to reduce the probability that catches will exceed the stocks' ACL; -Specified a rebuilding plan for red snapper; -Specified status determination criteria for red snapper; -Specified a fishery-independent monitoring program for red snapper. -Implemented an area closure for snapper-grouper species.
Emergency Rule	12/3/10	75 FR 76890	-Delayed the effective date of the area closure for snapper grouper species implemented through Amendment 17A.
Amendment #17B (2010b)	1/30/11	PR: 75 FR 62488 FR: 75 FR 82280	-Specify ACL of 0 and prohibit fishing for speckled hind and warsaw grouper; -Prohibited harvest of 6 deepwater species seaward of 240 feet to curb bycatch of speckled hind and warsaw grouper (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, silk snapper). -Specify allocations, ACLs and AMs for golden tilefish; -Modified management measures as needed to limit harvest to the ACL or ACT; -Updated the framework procedure for specification of total allowable catch; -Specified ACLs, ACTs, and AMs, where necessary, for 9 species undergoing overfishing (snowy grouper, black grouper, black sea bass, red grouper, vermilion snapper, gag, speckled hind, warsaw grouper, golden tilefish);
Regulatory Amendment #9 (2010a)	Bag limit: 6/22/11 Trip limits: 7/15/11	PR: 76 FR 23930 FR: 76 FR 34892	-Established trip limits for vermilion snapper and gag; -Increased trip limit for greater amberjack; -Harvest management measures for black sea bass (trip limit, split season quotas, carry-over of unused ACL, gear restrictions, bag limit modification, and a spawning season closure).
Regulatory Amendment #10 (2010b)	5/31/11	PR: 76 FR 9530 FR: 76 FR 23728	-Eliminated closed area for snapper grouper species approved in Amendment 17A.
Regulatory Amendment #11 (2011c)	5/10/12	PR: 76 FR 78879 FR: 77 FR 27374	-Eliminated 240 ft harvest prohibition for six deepwater species (snowy grouper, blueline tilefish, yellowedge grouper, queen snapper, silk snapper, misty grouper);
Amendment # 25 Comprehensive	4/16/12	PR: 76 FR 74757 Amended PR: 76 FR 82264	-Reorganize FMUs to 6 complexes (deepwater, jacks, snappers, grunts, shallow-water groupers, porgies) (see final rule for species list);

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Annual Catch Limit Amendment (2011d)		FR: 77 FR 15916	-Established acceptable biological catch (ABC) control rules and established ABCs, ACLs, and AMs for species not undergoing overfishing; -Removed some species from South Atlantic FMU (Tiger grouper, black margate, blue-striped grunt, French grunt, porkfish, smallmouth grunt, queen triggerfish, crevalle, yellow jack, grass pogy, sheepshead, puddingwife); -Designated species as ecosystem component species (schoolmaster, ocean triggerfish, bank triggerfish, rock triggerfish, longspine pogy); -Specified allocations between the commercial and recreational sectors for species not undergoing overfishing; -Limited the total mortality for federally managed species in the South Atlantic to the ACLs.
Amendment #24 (2011e)	7/11/12	PR: 77 FR 19169 FR: 77 FR 34254	-Rebuilding plan (including MSY, ACLs, AMs, and OY, and allocations) for red grouper.
Amendment #23 Comprehensive Ecosystem-based Amendment 2 (CE-BA2) (2011f)	1/30/12	PR: 76 FR 69230 FR: 76 FR 82183	-Designated the Deepwater MPAs as EFH-HAPCs; -Modify management measures for Octocoral; -Limit harvest of snapper grouper species in SC SMZs to the bag limit; -Modify sea turtle release gear; -Designated new EFP for pelagic Sargassum habitat.
Amendment #18A (2012a)	7/1/12	PR: 77 FR 16991 FR: 77FR3 2408	-Limited participation and effort in the black sea bass sector; -Modifications to management of the black sea bass pot sector; -Improved data reporting (accuracy, timing, and quantity of fisheries statistics).
Amendment #20A (2012b)	10/26/12	PR: 77 FR 19165 FR: 77 FR 59129	- Individual transfer quota (ITQ) program for wreckfish: -Defined and reverted inactive shares; -Redistributed reverted shares; -Established a share cap; -Established an appeals process.
Regulatory Amendment #12 (2012c)	10/9/12	PR: 77 FR 42688 FR: 77 FR 61295	-Revised the ACL and OY for golden tilefish; -Revised recreational AMs for golden tilefish;

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Amendment #18B (2013a)	5/23/13	PR: 77 FR 75093 FR: 77 FR 23858	For Golden Tilefish: -Limited participation and effort in the commercial sector through establishment of a longline endorsement; -Established eligibility requirements and allowed transferability of longline endorsement; -Established an appeals process; -Modified trip limits; -Specified allocations ACLs for gear groups (longline and hook and line); -Adjusted the fishing year.
Amendment #28 (2013b)	8/23/13	PR: 78 FR 25047 FR: 78 FR 44461	-Established regulations to allow harvest of red snapper in the South Atlantic (formula used to compute ACLs, AMs, fishing seasons).
Regulatory Amendment #13 (2013c)	7/17/13	PR: 78 FR 17336 FR: 78 FR 36113	-Revised the ABCs, ACLs (including sector ACLs), and ACTs for 37 species implemented by the Comprehensive ACL Amendment (see final rule for list of species). The revisions may prevent a disjunction between the established ACLs and the landings used to determine if AMs are triggered.
Regulatory Amendment #15 (2013d)	9/12/13	PR: 78 FR 31511 FR: 78 FR 49183	-Modified ACLs and OY for yellowtail snapper; -Modified the commercial and recreational yellowtail snapper fishing years and commercial spawning season closure; -Modified the gag commercial ACL and AM to remove the requirement that all other shallow water groupers (black grouper, red grouper, scamp, red hind, rock hind, graysby, coney, yellowmouth grouper, and yellowfin grouper) are prohibited from harvest in the South Atlantic when the gag commercial ACL is met or projected to be met.
Regulatory Amendment #18 (2013e)	9/5/13	PR: 78 FR 26740 FR: 78 FR 47574	-Revised ACLs and OY for vermilion snapper; -Modified commercial trip limit for vermilion snapper; -Modified commercial fishing season and recreational closed season for vermilion snapper; -Revised ACLs and OY for red porgy.
Regulatory Amendment #19 (2013f)	ACL: 9/23/13 Pot closure: 10/23/13	PR: 78 FR 39700 FR: 78 FR 58249	-Specified ABC, and adjusted the ACL, recreational ACT and OY for black sea bass; -Implemented an annual closure on the use of black sea bass pots from November 1 to April 30.
Amendment #27 (2013g)	1/27/2014	PR: 78 FR 78770 FR: 78 FR 57337	-Established the South Atlantic Council as the responsible entity for managing Nassau grouper throughout its range including federal waters of the Gulf of Mexico; -Modified the crew member limit on dual-permitted snapper grouper vessels;

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			<ul style="list-style-type: none"> -Modified the restriction on retention of bag limit quantities of some snapper grouper species by captain and crew of for-hire vessels; -Minimized regulatory delay when adjustments to snapper grouper species' ABC, ACLs, and ACTs are needed as a result of new stock assessments; -Removed blue runner from snapper grouper FMP; -Addressed harvest of blue runner by commercial fishermen who do not possess a South Atlantic Snapper Grouper Permit.
Amendment #31 Joint South Atlantic and Gulf of Mexico Generic Headboat Reporting Amendment (2013h)	1/27/2014	PR: 78 FR 59641 FR: 78 FR 78779	<ul style="list-style-type: none"> -Included under the Generic charter/headboat reporting amendment, that modified required logbook reporting for headboat vessels to require electronic reporting, regarding snapper grouper landings.
Regulatory Amendment #14 (2014a)	12/8/2014	PR: 79 FR 22936 FR: 79 FR 66316	<ul style="list-style-type: none"> -Modified the commercial and recreational fishing year for greater amberjack; -Modified the commercial and recreational sector fishing years for black sea bass; -Modified the recreational AM for black sea bass; -Modified the recreational AM for vermilion snapper; -Modify the commercial trip limit for gag.
Regulatory Amendment # 21 (2014b)	11/6/2014	PR: 79 FR 44735 FR: 79 FR 60379	<ul style="list-style-type: none"> -Modified the definition of the overfished threshold (MSST) for red snapper, blueline tilefish, gag, black grouper, yellowtail snapper, vermilion snapper, red porgy, and greater amberjack.
Amendment #29 (2014c)	7/1/2015	NOA: 79 FR 69819 PR: 79 FR 72567 FR: 80 FR 30947	<ul style="list-style-type: none"> -Updated the ABC control rule to incorporate methodology for determining the ABC of unassessed species; -Adjusted the ABCs for fourteen unassessed snapper-grouper species (see final rule); -Adjusted the ACLs and ACTs for three species complexes and four snapper-grouper species based on revised ABCs; -Established ACLs for unassessed species; -Modified gray triggerfish minimum size limits; -Established a commercial split season and commercial trip limits for gray triggerfish.
Blueline Tilefish Emergency Rule	4/17/2014 through 10/10/2014 or 4/18/2015	PR: 79 FR 21636 FR: 79 FR 61262	<ul style="list-style-type: none"> -Removed the blueline tilefish portion from the deep-water complex ACL; -Established separate commercial and recreational ACLs and AMs for blueline tilefish.

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Regulatory Amendment #20 (2014d)	8/20/2015	PR: 80 FR 18797 FR: 80 FR 43033	-Adjusted the recreational and commercial ACLs for snowy grouper; -Adjusted the rebuilding strategy; -Modified the commercial trip limit; -Modified recreational bag limit; -Modified the recreational fishing season.
Amendment #32 (2014e)	3/30/2015	PR: 80 FR 3207 FR: 80 FR 16583	-End overfishing of blueline tilefish; -Removed blueline tilefish from the deepwater complex; -Specified AMs, ACLs, recreational ACLs, commercial trip limit, adjust recreational bag limit for blueline tilefish; -Specified ACLs and revised the AMs for the recreational section of the deepwater complex (yellowedge grouper, silk snapper, misty grouper, queen snapper, sand tilefish, black snapper, and blackfin snapper);
Regulatory Amendment #22 (2015a)	Effective 9/11/2015, except for the amendments to §§ 622.190(b) and 622.193(r)(1) which were effective 8/12/2015	PR:80 FR 31880 FR:80 FR 48277	-Adjusted ACLs and OY for gag and wreckfish;
Amendment # 33 Dolphin Wahoo Amendment 7 and Snapper Grouper Amendment 33 (2015b)	12/28/2015	NOA:80 FR 55819 PR:80 FR 60601 FR:80 FR 80686	-Allowed dolphin and wahoo fillets to enter the U.S. EEZ after lawful harvest in The Bahamas; -Specified the condition of any dolphin, wahoo, and snapper-grouper fillets; -Described how the recreational bag limit is determined for any fillets; -Prohibited the sale or purchase of any dolphin, wahoo, or snapper-grouper recreationally harvested in The Bahamas; -Specified the required documentation to be onboard any vessels that have these fillets; -Specified transit and stowage provisions for any vessels with fillets.
Amendment #34 Generic Accountability Measures and Dolphin Allocation Amendment (2015c)	2/22/2016	NOA:80 FR 41472 PR:80 FR 58448 FR:81 FR 3731	-Modified AMs for snapper-grouper species (golden tilefish, snowy grouper, gag, red grouper, black grouper, scamp, the other shallow-water grouper complex (SASWG: red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby), greater amberjack, the other jacks complex (lesser amberjack, almaco jack, and banded rudderfish), bar jack, yellowtail snapper, mutton snapper, the other snappers complex (cubera snapper, gray snapper, lane snapper, dog snapper, and mahogany snapper), gray triggerfish, wreckfish (recreational sector), Atlantic

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			spadefish, hogfish, red porgy, the other porgies complex (jolthead porgy, knobbed porgy, whitebone porgy, scup, and saucereye porgy); -Modified the AM for commercial golden crab fishery; -Adjusted sector allocations for dolphin.
Amendment #35 (2015d)	6/22/2016	NOA:81 FR 6222 PR:81 FR 11502 FR:81 FR 32249	-Removed black snapper, dog snapper, mahogany snapper, and schoolmaster from the Snapper-Grouper FMP; -Clarified regulations governing the use of Golden Tilefish Longline Endorsements.
Regulatory Amendment #16 (2016a)	12/29/16 1/30/17 (gear marking)	NOI: 78 FR 72868 PR: 81 FR 53109	-Revise the prohibition of fishing with black sea bass pots from Nov.1-April 30. -Add additional gear marking requirements for black sea bass pot gear.
Regulatory Amendment #25 (2016b)	7/13/2016. 8/12/2016 for blueline tilefish actions.	PR:81 FR 34944 FR:81 FR 45245	-Revised commercial and recreational ACL for blueline tilefish; -Revised the recreational bag limit for black sea bass; -Revised the commercial and recreational fishing year for yellowtail snapper.
Amendment #37 (2016c)	TBD	NOI: 80 FR 45641 NOA:81 FR 69774 PR: 81 FR 91104	-Modify the hogfish fishery management unit; -Specify fishing levels for the two South Atlantic hogfish stocks; -Establish a rebuilding plan for the Florida Keys/East Florida stock; -Establish/revised management measures for both hogfish stocks in the South Atlantic Region, such as size limits, recreational bag limits, and commercial trip limits.
Amendment # 20B	TBD	TBD	-Update wreckfish ITQ according to reauthorized Magnuson-Stevens Act.
Amendment # 26 Comprehensive Ecosystem-Based Amendment 3 (CE-BA3) (OR – Bycatch Reporting Amendment)	TBD	TBD	-Modifies bycatch and discard reporting for commercial and for-hire vessels.
Amendment #36	TBD	TBD	-Establish SMZs to enhance protection for snapper-grouper species in spawning condition including speckled hind and warsaw grouper.

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 #38	TBD	TBD	-Expand the management boundaries for species in the snapper grouper fishery management unit.
Amendment #41	TBD	TBD	-Update the MSY, ABC, ACL, OY, minimum stock size threshold, designate spawning months for regulatory purposes, and revise management measures for mutton snapper.

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Appendix D. Bycatch Practicability Analysis

1.1 Population Effects for the Bycatch Species

Background

Mutton snapper in the Southeast United States is considered a single stock that is centered in south Florida. In 2015, an update to the stock assessment for mutton snapper was conducted under the Southeast Data, Assessment, and Review (SEDAR) process with data through 2013 (SEDAR 15A Update 2015). Through Amendment 41 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 41), the South Atlantic Fishery Management Council (Council) is revising management measures, updating biological benchmarks, and modifying allowable fishing levels for mutton snapper recommended by the latest stock assessment update (SEDAR 15A Update 2015). Revisions to management measures include designation of “spawning months,” during which stricter regulations may apply, as well as modifications to the minimum size limit, recreational bag limit, and commercial trip limit.

Commercial Sector

In the South Atlantic region, most mutton snapper by weight are harvested with hook and line gear, followed by spear fishing and traps. The data found in **Table D-1** list the species that contributed the most harvest (by weight) on trips that harvested mutton snapper in the South Atlantic. This analysis was conducted by isolating all of the 2011-2015 commercial logbook reported trips that had at least one pound of mutton snapper harvest in the South Atlantic region. Then the landings were summed by harvest weight for each species, and the top six were listed in **Table D-1**. There were three species (yellowtail snapper, greater amberjack, and vermilion snapper), which had more harvest than mutton snapper.

Table D-1. Top six species caught on commercial trips where at least one pound of mutton snapper was caught in the South Atlantic for 2011 and 2015. This analysis was conducted with the Southeast Fisheries Science Center (SEFSC) commercial logbook data.

Species	Percent of Harvest
Yellowtail Snapper	16.2%
Greater Amberjack	12.9%
Vermilion Snapper	11.9%
Mutton Snapper	6.8%
Gag Grouper	6.1%
Spiny Lobster	6.0%
Gray Triggerfish	4.5%

Source: Southeast Fisheries Science Center Commercial Logbook (April 2016)

Recreational Sector

For the recreational sector, during 2011-2015, estimates of the number of recreational discards were available from Marine Recreational Information Program (MRIP) and the National Marine Fisheries Service (NMFS) headboat survey. The MRIP 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.

During 2011-2015, information for charter trips came from two sources. Charter vessels for the fishery were selected to report by the Science and Research Director (SRD) to maintain a fishing record for each trip, or a portion of such trips as specified by the SRD, and on forms provided by the SRD. Harvest and bycatch information was monitored by MRIP. Since 2000, a 10% sample of charter vessel captains were called weekly to obtain trip level information, such as date, fishing location, target species, etc. In addition, the standard dockside intercept data were collected from charter vessels and charter vessel clients were sampled through the standard random digital dialing of coastal households. Precision of charter vessel effort estimates has improved by more than 50% due to these changes (Van Voorhees et al. 2000).

Harvest from headboats was monitored by NMFS at the Southeast Fisheries Science Center (SEFSC) Beaufort Laboratory. Collection of discard data began in 2004. Daily catch records (trip records) were filled out by the headboat operators, or in some cases by NMFS-approved headboat samplers based on personal communication with the captain or crew. Headboat trips were subsampled for data on species lengths and weights. Biological samples (scales, otoliths, spines, reproductive tissues, and stomachs) were obtained as time allowed. Lengths of discarded fish were occasionally obtained but these data were not part of the headboat database.

Recent improvements have been made to the recreational survey of MRIP, formerly called Marine Recreational Fisheries Statistics Survey. Beginning in 2013, samples were drawn from a known universe of fishermen rather than randomly dialing coastal households. Other improvements have been and will be made that should result in better estimating recreational catches and the variances around those catch estimates.

1.2 Finfish Bycatch Mortality

Currently, discard data are collected using a supplemental form that is sent to a 20% stratified random sample of the active permit holders. However, in the absence of any observer data, there are concerns about the accuracy of logbook data in collecting bycatch information. Biases associated with logbooks primarily result from inaccuracy in reporting of species that are caught in large numbers or are of little economic interest (particularly of bycatch species), and from low compliance rates.

The South Atlantic snapper grouper fisheries are characterized by moderately high discards, especially of black grouper, black sea bass, gag, red grouper, and red snapper (**Table D-2**). The majority of discards originate from handline/electric rig and trap gears, with some discards from trolling gear, and relatively low discards from other gears. It is possible that trip-level reporting leads to the relatively high discard estimates from trolling gear; these may be sets using another gear on a trip declared as a trolling gear trip. It is difficult to compare the ratio of commercial landings to commercial discards (**Table D-2**), because commercial landings are reported in pounds and discards are reported in numbers of fish; however red snapper discards appear to be high relative to landed commercial catch.

During 2011-2015, the private recreational mutton snapper landings and discards were higher than for either the headboat or charter boat modes (**Table D-2**). Recreational charter landings had the second highest landings and discards of the recreational modes. The commercial sector for mutton snapper in the South Atlantic landed 80,281 lbs and discarded 437 mutton snapper (**Table D-2**) per year.

Table D-2. Annual mean headboat, MRIP, and commercial estimates of landings and discards in the South Atlantic during 2011-2015. Headboat, MRIP (charter and private) landings are in numbers of fish (N); commercial landings are in pounds (lbs). Discards represent numbers of fish that were caught and released alive.

Species	HEADBOAT			CHARTER			PRIVATE			COMMERCIAL	
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (lbs)	Discards (N)
Almaco jack	4,765	296	6%	4,556	1,974	43%	6,613	29,410	445%	179,919	1,798
Atlantic spadefish	112	30	27%	396	8	2%	100,852	97,793	97%	24,384	0
Banded rudderfish	13,815	2,594	19%	4,562	2,010	44%	6,792	7,124	105%	71,767	105
Bar jack	532	66	12%	118	150	127%	2,649	10,245	387%	4,347	14
Black grouper	410	1,243	303%	1,680	8,367	498%	5,814	39,964	687%	64,589	1,266
Black sea bass	109,143	701,111	642%	60,244	354,258	588%	216,067	3,294,318	1525%	452,268	40,721
Blackfin snapper	357	80	22%	43	0	0%	1,949	0	0%	1,564	0
Blueline tilefish	5,523	76	1%	8,122	96	1%	18,775	1,631	9%	203,223	2,471
Coney	99	99	100%	13	52	413%	49	544	1104%	123	0
Cubera snapper	290	16	6%	87	0	0%	2,298	254	11%	3,967	6
Gag	1,606	2,704	168%	2,550	14,427	566%	8,552	71,465	836%	413,781	6,723
Golden tilefish	79	0	0%	1,447	0	0%	1,697	184	11%	589,761	17
Goliath grouper	0	61	N/A	0	1,190		0	10,273		0	73
Gray snapper	56,983	9,880	17%	21,070	11,685	55%	404,597	1,585,542	392%	125,369	5,624
Gray triggerfish	51,604	14,832	29%	43,498	11,295	26%	70,408	100,477	143%	347,706	1,412
Graysby	1,766	3,118	177%	1,024	465	45%	7,215	14,740	204%	748	40
Greater amberjack	3,676	3,396	92%	18,961	12,845	68%	16,549	21,127	128%	883,776	1,346
Hogfish	185	506	273%	46	0	0%	64,731	5,569	9%	37,237	293
Jolthead porgy	6,303	334	5%	3,172	0	0%	17,635	1,122	6%	7,810	84
Knobbed porgy	6,242	473	8%	585	0	0%	6,917	497	7%	22,756	2
Lane snapper	23,369	2,572	11%	12,996	4,221	32%	68,592	148,357	216%	2,664	267
Lesser amberjack	449	99	22%	15	0	0%	149	0	0%	14,133	21
Margate	969	259	27%	188	63	34%	2,574	1,135	44%	2,498	22

Species	HEADBOAT			CHARTER			PRIVATE			COMMERCIAL	
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (lbs)	Discards (N)
Misty grouper	4	0	6%	0	0		0	0		98	1
Mutton snapper	14,000	6,001	43%	22,714	12,425	55%	81,701	193,674	237%	80,281	437
Queen snapper	139	0	0%	0	0		0	0		2,165	82
Red grouper	1,549	7,512	485%	561	2,062	368%	10,144	38,733	382%	156,775	1,658
Red hind	158	106	67%	152	43	28%	466	185	40%	4,981	50
Red porgy	18,948	16,470	87%	13,765	9,338	68%	10,505	7,733	74%	165,716	10,120
Red snapper	1,743	47,409	2,719%	1,987	34,682	1,745%	21,316	173,302	813%	20,695	14,100
Rock hind	1,411	1,042	74%	100	18	18%	798	2,595	325%	8,773	24
Sailors choice	675	301	45%	210	758	362%	27,903	17,569	63%	2	0
Sand tilefish	1,061	1,534	145%	130	3,547	2731%	3,258	23,515	722%	1,195	13
Saucereye porgy	119	3	3%	0	0		1,293	0	0%	0	0
Scamp	1,978	1,447	73%	1,086	373	34%	3,192	305	10%	160,639	707
Scup	10,385	2,330	22%	453	0	0%	809	1,654	204%	85,266	298
Silk Snapper	1,230	64	5%	90	30	33%	153	620	405%	10,679	7
Snowy grouper	498	32	6%	248	360	145%	565	1,779	315%	101,091	336
Tomtate	54,332	62,727	115%	3,041	23,456	771%	37,676	175,374	465%	270	228
Vermilion snapper	123,838	75,864	61%	41,936	27,590	66%	64,634	74,214	115%	953,423	4,332
White grunt	156,473	50,045	32%	24,932	8,320	33%	197,508	197,726	100%	98,323	453
Whitebone porgy	5,390	491	9%	2,923	119	4%	16,053	2,570	16%	31	0
Yellowedge grouper	148	1	0%	41	0	0%	0	0		24,224	29
Yellowfin grouper	17	5	32%	0	0		97	0	0%	2,681	6
Yellowmouth grouper	11	4	32%	0	0		0	0		268	0
Yellowtail snapper	128,519	44,247	34%	260,309	94,080	36%	350,663	948,217	270%	1,257,708	47,271

Sources: MRIP data from SEFSC Recreational ACL Dataset (October 2016); Headboat data from SEFSC Headboat Logbook CRNF files (expanded; March 2016); Commercial landings data from SEFSC Commercial ACL Dataset (September 2016) with discard estimates from expanded SEFSC Commercial Discard Logbook (April 2016); Notes: Commercial discard estimates are for vertical line gear only; Estimates of commercial discards are highly uncertain;

Release Mortality Rates

Release mortality rates are unknown for many managed species. Recent Southeast Data, Assessment, and Review (SEDAR) assessments include estimates of release mortality rates based on published studies. Stock assessment reports can be found at <http://www.sefsc.noaa.gov/sedar/>.

SEDAR 15A (2008) assessed mutton snapper in the South Atlantic and Gulf. The stock was determined to be neither overfished nor undergoing overfishing. The stock was reassessed with an update assessment in 2015 (SEDAR 15A update), and again the stock was determined to be neither overfished nor undergoing overfishing. The SEDAR 15A update assessment (2015) used a 15% discard mortality rate for both the commercial and recreational sectors.

SEDAR 10 (2006) estimated release mortality rates of 40% and 25% for gag taken by commercial and recreational fishermen, respectively. SEDAR 15 (2008) estimated a 20% release mortality rate for greater amberjack. SEDAR 17 (2008) recommended a release mortality rate for vermilion snapper of 41% for the commercial sector and 38% for the recreational sector. The recent stock assessment for yellowtail snapper chose a rate of 10% release mortality as an approximation for the lower bound on release mortality for yellowtail snapper (FWRI 2012). SEDAR 24 (2010) used release mortality rates of 48% commercial; 41% for-hire, and 39% private recreational for red snapper. Commercial and recreational release mortality rates were estimated as 20% for black grouper and red grouper in SEDAR 19 (2010). Snowy grouper are primarily caught in water deeper than 300 feet and golden tilefish are taken at depths greater than 540 feet; (SEDAR 4 2004, SEDAR 25 2011). 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. Commercial sector discard mortality for red porgy is 35%, and 8% for the recreational sector (SEDAR Update 2012). SEDAR 32 (2013) for the South Atlantic estimates release mortality rates of 100% for blueline tilefish, which is consistent with other deep-water species (i.e., snowy grouper, and golden tilefish); however, if new management is implemented to reduce the discard mortality rate, it might be appropriate for population projections to consider something lower than 100%. SEDAR 32 (2013) also estimates a 12.5% release mortality rate for gray triggerfish.

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

Expected Impacts on Bycatch for the Proposed Actions

The Council is proposing to revise management measures, update biological benchmarks, and modify allowable fishing levels for mutton snapper. An update assessment was conducted in 2015 with data through 2013 (SEDAR 15A Update). The update results showed that mutton snapper in the South Atlantic were neither overfished nor undergoing overfishing.

Actions 1 and 2 would specify MSY and MSST. Bycatch and discards would not increase or decrease as a result of these actions.

Action 3 would revise the annual catch limits (ACL) and optimum yield (OY). A lower ACL could result in more discards; however, other actions are considered in this amendment that could help prevent the ACL from being exceeded (Actions 4 through 9). Additionally, the Commercial Landings Monitoring System came online in June 2012 and is now being used to track commercial landings of federally managed fish species. This system is able to track individual dealer reports, track compliance with reporting requirements, project harvest closures using five different methods, and analyze why annual catch limits are exceeded. The improved commercial monitoring mechanisms now in place in the South Atlantic Region is expected to reduce the likelihood of commercial ACL overages. Additionally, a Joint Dealer Reporting Amendment, which was implemented on August 7, 2014 has increased the required reporting frequency for dealers to once per week, and requires a single dealer permit for all finfish dealers in the Southeast Region. On January 27, 2014, the Generic For-Hire Reporting Amendment was implemented (78 FR 78779), which required all federally permitted headboats in the South Atlantic to report landings information electronically and on a weekly basis. The new Commercial Landings Monitoring System and actions in the Joint Generic Dealer and Generic For-Hire Reporting amendments (SAFMC, 2013b) are expected to provide more timely and accurate data reporting and would thus reduce the incidence of quota overages.

Action 4 would revise the annual catch target (ACT). This action would not be expected to affect discards and/or bycatch, since the only consequence of reaching the ACT would be to continue to monitor the landings, which the MRIP does continually.

Action 5 would modify the minimum size limit for both sectors. The greater the increase in the minimum size limit, the greater the probability for regulatory discards because time is needed for the population to “grow into” the new minimum size limit, and therefore, both commercial and recreational fishers have to discard larger numbers of fish that are under the size limit. However, in the commercial sector, the majority of the mutton snapper are harvested well above any of the minimum size limits being considered under **Alternatives 2** through **5**. In fact, 60% of the lengths are above the largest minimum size (20 inches TL) being considered in the amendment. Therefore, the level of regulatory discards in the commercial fishery as a result of any of the alternatives considered under this action is not expected to change. In the recreational sector, according to the SEDAR 15A Update (2015), there have been few instances of mutton snapper being discarded dead since the recreational landings survey was initiated in 1979 (initially the Marine Recreational Statistical Survey and later Marine Recreational Information Program) and recreational fishermen have reported high release survival of mutton snapper. The SEDAR 15A Update (2015) used a 15% discard mortality rate to estimate levels of dead discards. Increasing the minimum size limit is a management tool aimed to biologically benefit the mutton snapper stock. Not only does recent scientific research support such an increase based on the reproductive biology of mutton snapper, it is also the single most effective change to current management measures (based on projected landings) to achieve the necessary reduction in harvest to keep landings below the proposed ACL. Hence, biological effects from the expected increase in dead discards are expected to be minimal and similar across the minimum size limit alternatives considered under this action.

Action 6 would designate spawning months during which potentially stricter management measures would apply, but is not expected to, by itself, affect bycatch or regulatory discards.

Actions 7 and 8 would modify mutton snapper recreational bag limits and commercial trip limits during the regular season and during spawning months. Reducing recreational bag and commercial trip limits could be expected to increase regulatory discards. Further reduced trip limits during spawning months could decrease commercial fishing activities for mutton snapper, which would reduce discards. There is also potential for discards to increase in other fisheries if fishermen shift effort during months with stricter mutton snapper regulations. However, mutton snapper have a low discard mortality rate (15%); hence, no additional negative biological effects would be expected from alternatives that allow some retention during the designated “spawning months.”

Past, Current, and Future Actions to Prevent Bycatch and Improve Monitoring of Harvest, Discards, and Discard Mortality.

The Comprehensive Ecosystem-Based Amendment 2 (CE-BA 2; SAFMC 2011b) included actions that removed harvest of octocorals off Florida from the Coral, Coral Reefs, and Live/Hard Bottom Habitat Fishery Management Plan (Coral FMP); set the octocoral ACL for Georgia, South Carolina, and North Carolina equal to 0; modified management of special management zones (SMZs) off South Carolina; revised sea turtle release gear requirements for the snapper grouper fishery that were established in Amendment 15B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP; SAFMC 2008); and designated new essential fish habitat (EFH) and EFH-Habitat Areas of Particular Concern in the South Atlantic. There is no bycatch associated with octocoral harvest within the management area of the Coral FMP since harvest is prohibited. CE-BA 2 also included an action that limited harvest and possession of snapper grouper and coastal migratory pelagics (CMP) species to the bag limit in SMZs off South Carolina. This action could reduce bycatch of regulatory discards around SMZs by restricting commercial harvest in the area, but it would probably have very little effect on the magnitude of overall bycatch of snapper grouper species in the South Atlantic.

Other actions have been taken in recently implemented amendments that could reduce bycatch of and bycatch mortality of federally managed species in the South Atlantic. Amendment 13C to Snapper Grouper FMP (SAFMC 2006) required the use of 2 inch mesh in the back panel of black sea bass pots, which has likely reduced the magnitude of regulatory discards. Amendment 16 to the Snapper Grouper FMP (SAFMC 2009) 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). Furthermore, Amendment 17A to the Snapper Grouper FMP (SAFMC 2010a) required circle hooks for snapper grouper species north of 28 degrees latitude, which is expected to reduce

bycatch mortality of snapper grouper species. Amendment 17B to the Snapper Grouper FMP (SAFMC 2010b) established ACLs and AMs and address overfishing for eight species in the snapper grouper management complex: golden tilefish, snowy grouper, speckled hind, warsaw grouper, black sea bass, gag, red grouper, black grouper, and vermilion snapper. Overfishing is no longer occurring for golden tilefish, black sea bass, snowy grouper, red grouper, black grouper, and vermilion snapper.

The Comprehensive ACL Amendment (SAFMC 2011a) implemented ACLs and AMs for species not undergoing overfishing in the Fishery Management Plans for snapper grouper, dolphin and wahoo, golden crab and *Sargassum*, in addition to other actions such as allocations and establishing annual catch targets for the recreational sector. The Comprehensive ACL Amendment (SAFMC 2011a) 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.

Amendment 18A to the Snapper Grouper FMP (SAFMC 2011c), included actions that could reduce bycatch of black sea bass and the potential for interactions with protected species. Actions in Amendment 18A limited the number of participants in the black sea bass pot sector, required fishermen bring pots back to port at the completion of a trip, and limited the number of pots a fishermen can deploy. Amendment 24 to the Snapper Grouper FMP (SAFMC 2011d) established a rebuilding plan for red grouper, which was overfished and undergoing overfishing. Red grouper is no longer undergoing overfishing or overfished. Amendment 24 (SAFMC 2011d) also established ACLs and AMs for red grouper, which could help to reduce bycatch of red grouper and co-occurring species.

The final rule (78 FR 23858; April 23, 2013) for Amendment 18B to the Snapper Grouper FMP (SAFMC 2012), established an endorsement program for the commercial golden tilefish longline sector, which could have positive effects for habitat and protected species. Regulatory Amendment 14 to the Snapper Grouper FMP (SAFMC, 2014), which has been approved by the Council, includes actions that could adjust management measures for a number of snapper grouper species, some of which could reduce the magnitude of discards. Regulatory Amendment 15 to the Snapper Grouper FMP included actions for yellowtail snapper and gag that are expected to reduce bycatch of snapper grouper species (SAFMC, 2013a). Amendment 36 to the Snapper Grouper FMP, which is under review, includes actions to establish Spawning Special Management Zones (SMZs), and could reduce bycatch of many snapper grouper species, especially speckled hind and warsaw grouper.

The Joint Dealer Reporting Amendment (SAFMC 2013b), which went into effect on January 27, 2014, has changed the reporting frequency for landings by headboats from monthly to weekly, and requires that reports be submitted electronically. The action is expected to provide more timely information on landings and discards. Improved information on landings would help ensure ACLs are not exceeded. Furthermore, more timely and accurate information would

be expected to provide a better understanding of the composition and magnitude of catch and bycatch, enhance the quality of data provided for stock assessments, increase the quality of assessment output, and lead to better decisions regarding additional measures to reduce bycatch. Management measures that affect gear and effort for a target species can influence fishing mortality in other species. Therefore, enhanced catch and bycatch monitoring would provide better data that could be used in multi-species assessments.

The South Atlantic Council is developing an amendment to require that all federally permitted charter vessels report landings information to the SEFSC electronically. Additionally, an amendment will be developed to require that all federally permitted commercial fishing vessels in the southeast also report their logbook landings information electronically. These future actions will help to improve estimates on the composition and magnitude of catch and bycatch of snapper grouper species, as well as all other federally managed species in the southeast region.

Additional information on fishery related actions from the past, present, and future considerations can be found in **Chapter 6** (Cumulative effects) of the environmental assessment.

1.4 Ecological Effects Due to Changes in 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. As mentioned in the above section, actions have been taken, and are underway to reduce bycatch and enhance data reporting for snapper grouper species. Better bycatch and discard data would provide a better understanding of the composition and magnitude of catch and bycatch, enhance the quality of data provided for stock assessments, increase the quality of assessment output, and lead to better decisions regarding additional measures to reduce bycatch.

As summarized in **Section 1.1** of this BPA, most actions in Amendment 41 are not expected to result in significant changes in bycatch of mutton snapper. Additionally, as stated in **Chapter 3**, and analyzed in detail in **Chapter 4**, the biological (and consequently ecological) effects due to changes in the bycatch would likely be negligible.

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

Amendment 41 is not expected to affect major changes in bycatch of other fish species. Bycatch of other species is incidental in the hook-and-line fishery for mutton snapper. Furthermore, improved data monitoring and reporting measures have been implemented, and will continue to improve in the near future, which could be expected to reduce bycatch and discards.

1.6 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 sector is included in the grouping of the Atlantic mixed species trap/pot fisheries, which the 2015, 2016, and proposed 2017 LOF classifies as a Category II (March 14, 2014; 79 FR 77919, December 29, 2015; 81 FR 20550, April 8, 2016, and 81 FR 54019, August 15, 2016, respectively). 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 2000. The SDDP subsamples 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 in the South Atlantic are classified in the 2014, 2015, and 2016 LOF as Category III fisheries.

Although the black sea bass pot sector 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 sector operated within the snapper grouper fishery since it is executed primarily off North Carolina and South Carolina in waters ranging from 70-120 feet deep (21.3-36.6 meters). There are no known interactions between the black sea bass pot sector 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. Thus, the continued operation of the snapper grouper fishery in the southeast U.S. Atlantic exclusive economic zone is not likely to adversely affect sperm, fin, sei, and blue whales (NMFS 2006).

North Atlantic right and humpback whales may overlap both spatially and temporally with the black sea bass pot sector. 2007 Revisions to the Atlantic Large Whale Take Reduction Plan folded the Atlantic mixed species trap/pot fisheries into the plan (72 FR 193; October 5, 2007). The new requirements (78 FR 58249; September 23, 2013) to prohibit the use of black sea bass pots during November through April each year 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 Carolina 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 US 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.

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

Research and monitoring is ongoing to understand the effectiveness of proposed management measures and their effect on bycatch. 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. 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. Further, the Joint Commercial Logbook Reporting Amendment is being developed by the South Atlantic Council and the Gulf of Mexico Council, which would require electronic reporting of landings information by federally permitted commercial vessels to increase the timeliness and accuracy of landings and discard data.

Recreational discards are obtained from 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. Some observer information has been provided by Marine Fisheries Initiative and Cooperative Research Programs (CRP), but more is desired for the snapper grouper fishery. In December 2012, the Southeast Region Headboat Survey underwent a transition from paper logbooks to electronic logbooks, which is expected to improve the quality of data in that sector. As of January 1, 2013, a new electronic logbook replaced the paper logbook form. The form is available through a password protected Web site on the Internet, which can be accessed by personal computer, computer tablet, or “smart phone”. The South Atlantic Council approved the For-Hire Amendment at their March 2013 meeting, which was approved and implemented in January 2014. This amendment requires weekly electronic reporting by the headboat sector.

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 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. NMFS established the South East Fishery-Independent Survey in 2010 to strengthen fishery-independent sampling efforts in southeast U.S. 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 Fishing Practices and Behavior of Fishermen

Actions proposed in Amendment 41 could result in a modification of fishing practices by commercial and recreational fishermen. However, as discussed in **Sections 1.0** and **1.1** of this BPA, the magnitude of discards is not expected to be significantly affected by the proposed actions. It is difficult to quantify any of the measures in terms of reducing discards until bycatch has been monitored over several years. Commercial and recreational bycatch information is collected by NMFS, and that information will continue to be analyzed to determine what changes, if any, have taken place in terms of fishing practices and fishing behavior as a result of the actions implemented through this amendment.

Social effects of actions proposed in Amendment 41 are addressed in **Chapter 4** of this document. **Section 3.3.3** includes information on environmental justice.

Designating mutton snapper spawning months through Amendment 41 could result in a modification of fishing practices by commercial and recreational fishermen, thereby affecting the magnitude of discards during the designated timeframe. While it is likely bycatch of species in the snapper grouper FMU will be reduced during designated mutton snapper spawning months, there is a potential for the discards to increase in other fisheries if fishermen shift effort during months with stricter mutton snapper regulations.

Fishermen can be educated about methods to reduce bycatch and enhance survival of regulatory discards. While this may be advantageous for mid-shelf species, deepwater species

experience nearly 100% mortality from depth related trauma. Furthermore, it is not clear that changes in behavior could substantially affect the amount of bycatch incurred. Gear changes such as hook type or hook size could have some effect on reducing bycatch mortality. Furthermore, spawning seasons with stricter regulations, new or reduced quotas, reduced bag and trip limits, and increased size limits could cause some commercial and recreational fishermen to reduce effort. Social effects of the proposed actions are addressed in **Chapter 4** of the amendment.

1.9 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. 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. In 1999, logbook reporting was initiated for vessels catching king and Spanish mackerel (Gulf of Mexico and South Atlantic Fishery Management Councils). Approximately 20% of commercial fishermen from snapper grouper, dolphin wahoo, and CMP fisheries 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 MRIP and logbooks from the NMFS headboat program.

Additional data collection activities for the recreational sector of the snapper grouper, dolphin wahoo, and CMP fisheries are being considered by the Council that could allow for a better monitoring of bycatch in the future. The Council is also developing an amendment to improve commercial logbook reporting for these fisheries. Some observer information for the snapper grouper fishery has been provided by the SEFSC, Marine Fisheries Initiative, and Cooperative Research Programs (CRP), but more is desired for the snapper grouper, dolphin wahoo, and CMP fisheries. Currently, for the snapper grouper fishery, headboats are required to carry observers, if selected.

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. (Foundation) 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.

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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.

Stranding networks have been established in the Southeast Region. The NMFS SEFSC is the base for the Southeast United States Marine Mammal Stranding Program (http://sero.nmfs.noaa.gov/protected_resources/marine_mammal_health_and_stranding_response_program/index.html). NMFS authorizes organizations and volunteers under the MMPA to respond to marine mammal strandings throughout the United States. These organizations form the stranding network whose participants are trained to respond to, and collect samples from live and dead marine mammals that strand along southeastern United State beaches. The SEFSC is responsible for: coordinating stranding events; monitoring stranding rates; monitoring human caused mortalities; maintaining a stranding database for the southeast region; and conducting investigations to determine the cause of unusual stranding events including mass strandings and mass mortalities (<http://www.sefsc.noaa.gov/species/mammals/strandings.htm>). The Southeast Regional Office and the SEFSC participate in a wide range of training and outreach activities to communicate bycatch related issues. The NMFS Southeast Regional Office issues public announcements, Southeast Fishery Bulletins, or News Releases on different topics, including use of turtle exclusion devices, bycatch reduction devices, use of methods and devices to minimize harm to turtles and sawfish, information intended to reduce harm and interactions with marine mammals, and other methods to reduce bycatch for the convenience of constituents in the southern United States. These are mailed out to various organizations, government entities, commercial interests and recreational groups. This information is also included in newsletters and publications that are produced by NMFS and the various regional fishery management councils. Announcements and news released are also available on the internet and broadcasted over NOAA weather radio. NMFS established the South East Fishery-Independent Survey in 2010 to strengthen fishery independent sampling efforts in southeast U.S. 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.

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

Any changes in economic, social, or cultural values from the proposed actions are discussed in **Chapter 4** of the environmental assessment.

1.11 Changes in the Distribution of Benefits and Costs

The distribution of benefits and costs expected from proposed actions in the environmental assessment are discussed in **Chapter 3**. Economic and social effects of the proposed actions are addressed in **Chapter 4** of this document.

1.12 Social Effects

The social effects of all the measures are described in **Chapter 4** of the environmental assessment.

1.13 Conclusion

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality using the ten factors provided at 50 CFR section 600.350(d)(3)(i). In summary, measures proposed in Amendment 41 are intended to revise management measures, update biological benchmarks, and modify allowable fishing levels for mutton snapper recommended by the latest stock assessment update. These actions are necessary to base mutton snapper management measures on the best scientific information available in order to achieve and maintain OY and to prevent overfishing while minimizing, to the extent practicable, adverse social and economic effects. As summarized in **Section 1.3** of this BPA, the actions in Amendment 41 are not expected to result in significant changes in bycatch of mutton snapper. In addition, the Council, NMFS, and the SEFSC have implemented and plan to implement numerous management measures and reporting requirements that have improved, or are likely to improve monitoring efforts of discards and discard mortality. Therefore, no additional action is needed to minimize bycatch or bycatch mortality within the snapper grouper fishery.

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Appendix E. Regulatory Impact Review

Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) It provides a comprehensive review of the level and incidence of impacts associated with a regulatory action; 2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives which could be used to solve the problem; and 3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost effective way. The RIR also serves as the basis for determining whether any proposed regulations are a "significant regulatory action" under certain criteria provided in Executive Order 12866 (E.O. 12866) and whether the approved regulations will have a "significant economic impact on a substantial number of small business entities" in compliance with the Regulatory Flexibility Act of 1980.

Problems and Objectives

The purpose and need, issues, problems, and objectives of this action are presented in **Chapter 1** of this amendment and are incorporated herein by reference.

Description of Fisheries

A description of the mutton snapper portion of the snapper grouper fishery of the Atlantic region is provided in **Chapter 3** of this Amendment and is incorporated herein by reference.

Effects of Management Measures

A detailed analysis and discussion of the expected economic effects of each alternative for all proposed actions is included in **Chapter 4**. The following discussion summarizes the expected economic effects of the preferred alternatives for each action.

Action 1. Specify maximum sustainable yield (MSY) for mutton snapper in the South Atlantic Region

Defining MSY for mutton snapper under **Preferred Alternative 2** would not alter the current harvest or use of the mutton snapper resource. Specification of MSY merely establishes a benchmark for resource evaluation on which additional management actions would be based, if necessary. Since there would be no direct effects on resource harvest or use, **Preferred Alternative 2** would have no direct economic effects on fishery participants, associated industries, or communities. Specifying MSY, however, establishes the platform for future

management, specifically from the perspective of bounding allowable harvest levels. In this sense, MSY may be considered to have indirect effects on fishery participants. Any indirect economic effects are dependent on subsequent regulatory action.

Action 2. Specify minimum stock size threshold (MSST) for mutton snapper in the South Atlantic Region

Preferred Alternative 3 establishes maximum stock size threshold (MSST) for mutton snapper. Like MSY, MSST does not alter the current harvest or use of the resource, and thus would have no direct economic effects on fishery participants and associated industries or communities.

Action 3. Revise annual catch limits (ACLs) and optimum yield (OY) for mutton snapper in the South Atlantic Region

The **Preferred Alternative 2/Sub-alternative 2a** for **Action 3** establishes an annual catch limit (ACL) mutton snapper. Based on average historical landings from 2010-2014, neither the recreational nor commercial fishing sectors for are expected to catch the sector ACLs specified for mutton snapper, which allows room for some expansion of the fishery should fishing behavior change. However, no direct economic effects are expected for fishery participants, associated industries, or communities.

Action 4. Revise recreational annual catch target (ACT) for mutton snapper in the South Atlantic Region

The ACT being established by this action only applies to the recreational sector and is not tied to the AMs; therefore, the realized economic effects of **Action 4** are expected to be minimal. While there currently are no AMs triggered by the ACT for mutton snapper, there is the potential for AMs to be tied to the ACT in the future, thereby creating economic effects. Should this occur, **Sub-alternative 2c** provides the largest step-down from the ACL to the ACT and would create the largest potential negative economic effect if set as trigger for the AMs, while **Sub-alternative 2b** provides the smallest step-down from the ACL to the ACT, thereby leading to the smallest potential negative economic effect. **Preferred Sub-alternative 2a** falls in between the other two sub-alternatives.

Action 5. Modify mutton snapper minimum size limit in the South Atlantic Region

Size limits that result in more spawning and/or higher fecundity would result in more long-term positive economic effects presumably through the availability of increased numbers of fish in the future. However, there are some direct, short-term, negative economic effects as fewer fish would be available to harvest until the current population grows into the new minimum size and/or the biomass of harvestable fish increases. In the commercial sector, size limits can increase the number of discarded fish and trip costs if a vessel takes longer or more trips to mitigate the reduced landings per trip. This could negatively affect the profitability of a fishing trip and/or the overall annual profitability of a commercial fishing business. In the recreational sector, the initial decrease in fish available for harvest could negatively affect consumer surplus

for a fishery. Net operating revenue for charter and head boat trips may be negatively affected as well if overall fishing effort decreases or trips become more costly due to higher search costs. The greater the increase in the minimum size limit from **Alternative 1 (No Action)**, the greater the probability for short-term negative economic effects. However, an increase in the minimum size limit above **Alternative 1 (No Action)** could also result in greater long-term positive economic effects as long as increased size limits translate into a larger spawning stock biomass and overall biomass increasing above the minimum limit.

For **Preferred Alternative 3**, the expected short-term range of reductions in consumer surplus (CS) resulting from reduced landings of mutton snapper in the recreational sector is approximately \$760,000 to \$1.86 million (2015 dollars), depending on the marginal CS proxy value that is used. For the commercial sector, the expected decrease in ex-vessel value under **Preferred Alternative 3** is \$6,585 (2015 dollars) based on projected reductions in commercial landings of mutton snapper. In total, quantifiable negative economic effects for **Preferred Alternative 3** are expected to range from approximately \$767,000 to \$1.87 million (2015 dollars).

Action 6. Designate spawning months during which certain commercial and recreational management measures for mutton snapper should apply in the South Atlantic Region

Currently, during May through June, the commercial sector is restricted to 10 mutton snapper per person per day or 10 per person per trip but regulations do not change for the recreational sector. Without a change in management measures during the spawning season, there would be no expected direct economic effects to the recreational sector from **Action 6**. Commercial fishing operations will likely see an expansion of the current spawning season restrictions that limit the number of mutton snapper that can be landed per trip, thereby potentially decreasing the profitability of these commercial trips. Presumably these short-term negative economic effects may be offset if the biomass of mutton snapper improves as a result of additional protection during the spawning period. The effects of an expansion of the designated “spawning months” is captured in **Action 8**.

Action 7. Modify mutton snapper recreational bag limit in the South Atlantic Region

The sub-alternatives of **Preferred Alternative 4** for **Action 7** would establish a recreational bag limit that would be more restrictive than the current 10 fish per person per day aggregate snapper limit (**Alternative 1 (No Action)**). Anglers tend to land fewer than five mutton snapper per person on a single trip. Therefore, setting the bag limit at 5 fish per person per day in **Preferred Sub-alternative 4c** would have little effect in constraining recreational harvest on its own in most cases and is expected to have relatively minor negative economic effects compared to other management measures such as a change in the minimum size limit. The estimated short-term decrease in consumer surplus (CS) as a result of **Preferred Sub-alternative 4c** ranges from \$2,105 to \$5,149 (2015 dollars).

Action 8. Modify mutton snapper commercial trip limit in the South Atlantic Region

The sub-alternatives of **Preferred Alternative 2** set trip limits during the “regular season.” The lower the trip limit, the more likely some commercial vessels will experience negative economic effects. Lower trip limits may reduce profitability for commercial vessels on some trips through a reduction in revenue and efficiency. Some permit holders are restricted to a 225-pound limit of snapper grouper species and would not be affected by the commercial trip limits in **Preferred Alternative 2**. For the remaining permit holders, negative economic effects may occur due to trip limits proposed in **Preferred Alternative 2**; however, these effects are expected to be minimal on most trips, as the vast majority of commercial trips land 500 pounds or less of mutton snapper per trip. Nevertheless, there are some negative economic effects expected to occur in comparison to **Alternative 1 (No Action)**. The short-term decrease in ex-vessel value of mutton snapper landings expected to occur due to **Preferred Sub-alternative 2c**, which sets a 500-pound trip limit, is \$6,411 (2015 dollars).

The sub-alternatives of **Preferred Alternative 3** set trip limits during the designated “spawning months” (**Action 5**). The realized severity of such impacts on a commercial trip would be based on the overall dependence a vessel has on mutton snapper, the ability of the vessel to exceed the current trip limit specified during May and June in **Alternative 1 (No Action)**, and the vessel’s ability to substitute other species to make up for loss of revenue from reduced mutton snapper landings. The decrease in ex-vessel value of mutton snapper landings expected to occur due to **Preferred Sub-alternative 3f**, which sets a trip limit of 5 fish per person, per day or trip, is \$23,566 (2015 dollars). In total, the estimated short-term economic effect of **Action 8** is to decrease the ex-vessel value of mutton snapper landings by \$29,977 (2015 dollars).

Cumulative Economic Effects Summary

Action 1 Preferred Alternative 2 (Specifying MSY), **Action 2 Preferred Alternative 3** (Specifying MSST), **Action 3 Preferred Sub-alternative 2a** (Revising ACLs and OY), and **Action 4 Preferred Sub-alternative 2b** (Revising the recreational ACT) are not anticipated to have any direct economic effects on fishery participants and associated industries or communities.

Cumulatively, for the recreational sector **Action 5 Preferred Alternative 3** (Modifying the minimum size limit) paired with **Action 7 Preferred Sub-alternative 4c** (Modifying the recreational bag limit) is expected to result in a short-term decrease in consumer surplus ranging from \$759,785 to \$1,858,958 (2015 dollars), depending on the marginal consumer surplus estimate used for the value of a mutton snapper. For the commercial sector, the combined short-term effects of **Action 5 Preferred Alternative 3** (Modifying the minimum size limit), **Action 6 Preferred Sub-alternative 2a** (Designating spawning months), **Action 8 Preferred Sub-alternative 2c** (Establishing a commercial trip limit during the “regular season”), and **Action 8 Preferred Sub-alternative 3f** (Modify the commercial trip limit during the “spawning months”) are to decrease the ex-vessel value of mutton snapper landings by \$36,562 (2015 dollars).

The overall net direct short-term negative economic effects are expected to be between \$796,347 and \$1,895,520 (in 2015 dollars) in 2017.

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, which can be expressed as costs associated with the regulations. Costs associated with this action include, but are not limited to Council costs of document preparation, meeting, and other costs; NMFS administration costs of document preparation, meetings and review, and annual law enforcement costs. A preliminary estimate is up to \$200,000 before annual law enforcement costs.

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, these actions have been determined to not be economically significant for the purposes of E.O. 12866.

Appendix F. Regulatory Flexibility Analysis

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

With certain exceptions, the RFA requires agencies to conduct a regulatory flexibility analysis for each proposed rule. The regulatory flexibility analysis is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. The following regulatory flexibility analysis was conducted to determine if the proposed rule would have a significant economic impact on a substantial number of small entities or not.

Statement of the need for, objective of, and legal basis for the proposed rule

The primary purpose and need, issues, problems, and objectives of the proposed action are presented in **Section 1.2** and are incorporated herein by reference.

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

No federal rules have been identified that duplicate, overlap or conflict with the proposed rule.

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

This rule concerns commercial and recreational fishing for mutton snapper in the South Atlantic EEZ. Anglers are not considered small entities as that term is defined in 5 U.S.C. 601(6), whether fishing from for-hire fishing, private or leased vessels. Therefore, an estimate of the number of anglers directly affected by the rule is not provided here.

The rule would directly apply to businesses that operate commercial fishing vessels that harvest mutton snapper in the South Atlantic EEZ. Any commercial fishing vessel that harvests mutton snapper or any other species or species group of the snapper grouper fishery in the South Atlantic EEZ must have a valid commercial snapper grouper permit that is specifically assigned to that vessel. The permit is a limited access permit for either an unlimited quantity of pounds (of most species within the fishery) per trip or no more than 225 pounds per trip.

As of September 12, 2016, there are 525 valid unlimited and 104 valid 225-lb permits. If all of the permits that are currently not valid but are renewable are included, there would be 551 unlimited and 114 225-lb permits representing a total of 665 commercial fishing vessels that may be directly affected by the rule. Approximately 71% of the permits (and vessels) are owned by Florida residents.

An estimated 557 businesses own the above snapper grouper permits and operate the 665 vessels. Approximately 91% (506) of these businesses operate only one of the 665 permitted vessels (**Table F-1**). Half of a percent of the businesses operate approximately 5% of the vessels. Of the businesses with one permitted vessel, 106 have 225-lb permits and 400 have unlimited pounds permits. Of the 51 businesses with multiple permitted vessels, 46 hold only unlimited pound permits. The other five businesses with multiple permitted vessels have at least one 225-lb permit.

Table F-1. Number of Businesses by Number of Vessels Owned/Operated with SA Snapper Grouper Permits.

Permitted vessels	Number		Percent of vessels	Percent of businesses
	Businesses	Combined vessels		
1	506	506	76.1%	90.8%
2	31	62	9.3%	5.6%
3	8	24	3.6%	1.4%
4	6	24	3.6%	1.1%
5	3	15	2.3%	0.5%
6 and Over	3	34	5.1%	0.5%
Total	557	665	100.0%	100.0%

Source: NMFS SERO PIMS as of September 12, 2016.

A significant number of the permitted vessels do not have landings of mutton snapper in any given year and some of these vessels cannot land the species. Permitted vessels that use longline gear are prohibited from landing (or possessing) mutton snapper in the South Atlantic EEZ (50 CFR 622.188(g)). From 2011 through 2015, from 254 (38.2%) to 278 (41.8%) of the 665 permitted vessels landed mutton snapper in a year, and an annual average of 263 vessels landed the species (**Table F-2**). The range of number of vessels represents a range of the number of businesses that would be directly affected annually from the rule: from 213 to 232, with an average of 219 (39.3% of the 557 with a permitted vessel).

The average vessel with landings of (South Atlantic) mutton snapper from 2010 through 2014 landed from 165 lbs gw to 240 lbs gw annually with a dockside value from \$471 to \$722 (2015 \$) (**Table F-2**). When all landings and dockside revenues are combined, that average vessel annually harvests 19,175 lbs gw of marine species with dockside revenue (2015 \$) of \$52,739 (**Table F-3**), and its mutton snapper landings account for approximately 1.2% of its total dockside revenue.

Table F-2. Number of Vessels with Mutton Snapper Landings and Average Landings per Vessel (by Weight and Dockside Revenue (2015 \$)) in South Atlantic Region, 2010-2014.

Year	Number of Vessels	South Atlantic Region mutton snapper landings			
		Lbs gw	Ave lbs gw per vessel	Real dockside revenue (2015 \$)	Average real dockside revenue (2015 \$) per vessel
2010	315	51,749	165	\$148,468	\$471
2011	278	52,679	189	\$164,448	\$592
2012	258	61,943	240	\$184,542	\$713
2013	254	57,471	226	\$180,582	\$708
2014	257	59,683	232	\$188,372	\$722
Average	272	56,705	210	\$173,281	\$641

Source: NMFS SEFSC Online Economic Query System, January 23, 2017 and U.S. Bureau of Economic Analysis (BEA) for GDP deflator index.

Table F-3. Average Landings per Vessel (by Weight and Dockside Revenue (2015 \$)) of All Species by Vessels with Mutton Snapper in South Atlantic Region, 2011-2015.

Year	Vessels	All landings by vessels with South Atlantic mutton snapper landings			
		Lbs gw ¹	Average lbs gw per vessel	Real dockside revenue (2015 \$)	Average real dockside revenue (2015 \$) per vessel
2010	315	5,824,004	18,489	\$13,933,579	\$44,234
2011	278	5,626,744	20,240	\$14,464,831	\$52,032
2012	258	4,897,337	18,909	\$13,353,390	\$51,557
2013	254	4,922,700	19,305	\$14,398,813	\$56,466
2014	257	4,941,564	18,933	\$15,505,018	\$59,406
Average	272	5,242,470	19,175	\$14,331,126	\$52,739

1. Includes landings made by these vessels in other regions.

Source: NMFS SEFSC Online Economic Query System, January 23, 2017, and BEA GDP deflator index.

A business in the commercial fishing industry (NAICS code 11411) is a small business if its annual receipts are no more than \$11 million. The average vessel that landed mutton snapper from 2011 through 2015 had annual dockside revenue from all landings ranging from \$44,234 to \$59,406 (**Table F-3**).

Even with allowance for some businesses owning multiple vessels, it is expected that almost all to all of the commercial fishing businesses directly affected by the rule have annual revenues less than the size standard. Therefore, it is concluded that from 213 to 232 small commercial fishing businesses, with an annual average of 219, would be directly affected by this rule; and approximately 85% of them are located in Florida.

Description and economic impacts of compliance requirements of the rule

Action 1 (Preferred Alternative 2) would specify the MSY and **Action 2 (Preferred Alternative 3)** would specify the MSST for mutton snapper. Neither of these two actions would have a direct economic impact on any small business. Any indirect impacts would be dependent on subsequent actions.

Action 3 (Preferred Sub-alternative 3a), **Action 4 (Preferred Alternative 2b)**, **Action 5 (Preferred Alternative 3)** and **Action 7 (Preferred Alternative 4c)** would affect anglers, and as explained previously, anglers are not small entities. Therefore, the impacts of those actions on anglers are not evaluated here.

Action 3 (Preferred Sub-alternative 2a) would revise the ACL and OY for mutton snapper. The commercial ACL was established in 2012, and since 2012, the commercial ACL for the species has been set at 157,743 lbs (ww). **Action 3** would reduce the commercial ACL for mutton snapper to 100,015 lbs ww in 2017 and then increase it up to 111,354 lbs ww by 2020 and beyond (**Table F-4**).

Table F-4. Comparison of Baseline and Proposed Commercial ACL for Mutton Snapper.

Year	Commercial ACL (lbs ww)		
	Alternative 1 (No Action)	Preferred Sub-alternative 2a	Change
2017	157,743	100,015	-57,728
2018	157,743	104,231	-53,512
2019	157,743	107,981	-49,762
2020+	157,743	111,354	-46,389

The commercial fishing season for mutton snapper is from January 1 through December 31 each year. Since 2012, if landings reach or are projected to reach the commercial ACL, the season is closed early. The impact of **Action 3's** revised commercial ACL on small businesses is dependent on baseline commercial landings relative to the revised ACL. If baseline landings are greater than the revised ACL, an early closure would be expected each year and with that a decrease in annual landings and associated dockside revenue.

From 2012 through 2015, annual commercial landings of mutton snapper never reached or were projected to reach the ACL (157,743 lbs ww) and a season never closed early. In fact, less than 100,000 lbs ww were landed annually during those years (**Table F-5**), and preliminary data

for 2016 indicate 68,274 lbs ww were landed. Those baseline landings are less than the revised ACL of **Preferred Sub-alternative 2a (Table F-4)** and therefore, it is expected that **Action 3** would have no economic impact on any of the small businesses.

Table F-5. Commercial Landings of Mutton Snapper, 2012 through 2015.

Year	Baseline landings (lbs ww)
2012	77,122
2013	74,229
2014	87,981
2015	92,569
Average	82,975

Source: NMFS SERO ACL.

Action 5 (Preferred Alternative 3) would increase the minimum size limit of mutton snapper from 16 (406.4 mm) to 18 inches (457.2 mm) TL. Commercial landings data for southeast Florida from 1990 through 2008 indicate an average commercial size of 520 mm, which is approximately 20.5 inches TL (Ault and Franklin, 2011, p. 65). More recently, data from the SEFSC indicates approximately 60% of mutton snapper harvested by the commercial sector are greater than 20 inches TL, and the most frequent length was over 25 inches TL. That suggests **Action 5's** 18-inch TL minimum size limit would be less than the expected length of a commercially sized mutton snapper, and there would be little adverse impact on small businesses. SEFSC Trip Intercept Program data from 2011 through 2013 suggests an increase from 16 to 18 inches TL could reduce average annual landings by 3.8%. With average annual landings of 272 lbs gw per vessel, a 3.8% reduction would be an average annual loss of 10.3 lbs gw. At an average dockside price (2015 \$) of \$2.96 per lb gw, the average vessel would lose \$30.08 annually. That loss represents approximately 0.06% of the average vessel's annual dockside revenue from all landings (\$52,739).

To mitigate for a loss of dockside revenue, a vessel could either increase the length or number of trips in the EEZ or relocate to state waters where there is a smaller minimum size limit. That is not expected, however, for two reasons. First, because commercial vessels typically do not take trips that target mutton snapper, and landings of the species account for a very small percentage of a vessel's annual dockside revenue from all landings. Second, Florida vessels account for approximately 95% of trips with mutton snapper landings; and beginning January 1, 2017, the minimum size limit in Florida waters will be 18 inches TL.

Action 6 (Preferred Sub-alternative 2a) would designate April, May and June as spawning months. The non-spawning months would be from January through March and from July through December. The action has no direct economic impact on any small business and its indirect impacts are dependent on **Action 8**.

Action 8 would establish a commercial trip limit during the spawning months of April through June and a different commercial trip limit during the other nine months of the fishing year. Specifically, **Preferred Alternative 3 (Sub-alternative 3f)** of **Action 8** would establish a possession limit of 5 mutton snapper per person per day or per trip, whichever is more restrictive,

during the spawning months of April, May and June, and **Preferred Alternative 2 (Sub-alternative 2c)** of **Action 8** would establish a commercial limit of 500 lbs ww per trip during the other months of the fishing year. There is and has been a limit of 10 mutton snapper per person per day or per trip (within the aggregate snapper limit) in May and June and no trip limit during the other months.

The average commercial fishing vessel that landed mutton snapper from 2010 through 2014 landed 38 lbs gw of mutton snapper per trip (for those trips that landed the species). That average varies considerably by gear as shown in **Table F-6**. While the average hook-and-line vessel landed 50 lbs gw of mutton snapper per trip, the average vessel that used troll lines landed 26 lbs gw per trip.

Table F-6. Average Mutton Snapper Landings (lbs gw) per Trip by Gear, 2010-2014.

Year	Average mutton snapper landings (lbs gw) per trip by gear							
	Diving outfits	By hand, other	Hook & line	Rod & reel	Traps & pots	Troll lines	Other gears	All
2010	14	45	35	35		30	24	35
2011	40	35	50	32		21	44	36
2012	85	43	61	40		23	25	44
2013	46	31	55	39		37	22	41
2014	69	34	49	30	4	19	18	35
Average	51	38	50	35	4	26	27	38

Source: NMFS SEFSC Online Economic Query System, January 23, 2017.

Under **Preferred Alternative 3 (Sub-alternative 3f)**, a vessel's trip limit of mutton snapper landings from April through June would be dependent on the size of its crew (including its captain). From 2011 through 2015, the average commercial vessel with mutton snapper landings had approximately two persons on board. That would suggest that under **Preferred Sub-alternative 3f**, the average vessel that lands mutton snapper would be limited to landing no more than 10 mutton snapper per trip during the three spawning months. However, the average size of a vessel's crew varies with the gears used. For example, while the typical vessel that uses troll line has a crew ranging from 1 to 2 persons, a typical vessel that uses hook and line has from 2 and 3 crewmembers (**Table F-7**).

Using the information in **Tables F-6** and **F-7**, the average crewmember landed from 1.2 to 21.3 lbs gw of mutton snapper per trip depending on the type of gear used. The highest average in any given year was 28.3 lbs gw in 2012 for a crewmember of a diving-outfits vessel (**Table F-8**).

Table F-7. Average Number of Crewmembers on Mutton Snapper Trip by Gear, 2010 through 2014.

Year	Average number of crew per trip (all months)							
	Diving outfits, other	By hand, other	Hook & line	Rod & reel	Traps & pots	Troll lines	Other gears	All
2010	2.3	2.4	2.5	1.9		1.6	2.2	2.0
2011	2.4	2.1	2.4	1.9		2.0	2.0	2.0
2012	3.0	2.5	2.4	1.9		1.5	2.2	2.1
2013	2.6	2.5	2.3	2		1.5	2.1	2.2
2014	2.5	2.3	2.2	1.9	3.0	1.5	2.3	2.1
Average	2.6	2.4	2.4	1.9	3.0	1.6	2.2	2.1

Source: SEFSC Online Economic Query System, January 23, 2017.

Table F-8. Average Landings (lbs gw) of Mutton Snapper per Crewmember per Trip, 2010-2014.

Year	Average landings (lbs gw) of mutton snapper per crewmember per trip (all months)							
	Diving outfits, other	By hand, other	Hook & line	Rod & reel	Traps & pots	Troll lines	Other	All gears
2010	6.0	18.7	13.9	18.7		18.9	10.8	17.3
2011	16.6	16.6	20.8	17.0		10.6	21.9	17.9
2012	28.3	17.2	25.4	21.2		15.2	11.4	20.9
2013	17.5	12.5	24.1	19.3		24.6	10.7	18.5
2014	27.5	14.7	22.4	15.7	1.2	12.9	7.9	16.4
Average	19.2	15.9	21.3	18.4	1.2	16.4	12.5	18.2

The average weight of a commercially harvested mutton snapper was determined to be 7.68 lbs ww (6.92 lbs gw) in the most recent stock assessment (SEDAR 15A update 2015). Using that average weight per fish and the average landings (lbs gw) per crewmember above (**Table F-8**), estimates of the average number of mutton snappers that are landed per crewmember per trip are derived by gear (**Table F-9**). None of the averages are 5 or more fish per crewmember. That suggests the 5-fish-per-person limit from April through June would not have an impact on any of the vessels or small businesses.

Table F-9. Average Number of Mutton Snapper Landed per Trip by Gear, if average weight is 6.92 lbs gw per fish, 2010-2014.

Year	Average number of mutton snapper per crewmember per trip (all months)							
	Diving outfits, other	By hand, other	Hook & line	Rod & reel	Traps & pots	Troll lines	Other	All gears
2010	0.9	2.7	2.0	2.7		2.7	1.6	2.5
2011	2.4	2.4	3.0	2.5		1.5	3.2	2.6
2012	4.1	2.5	3.7	3.1		2.2	1.6	3.0
2013	2.5	1.8	3.5	2.8		3.6	1.5	2.7
2014	4.0	2.1	3.2	2.3	0.2	1.8	1.1	2.4
Average	2.8	2.3	3.1	2.7	0.2	2.4	1.8	2.6

If the average size of a commercially harvested mutton snapper were substantially smaller, such as 30% smaller (4.84 lbs gw), the average crewmember of a commercial vessel that landed mutton snapper from 2010 through 2014 would continue to account for less than 5 mutton snappers per trip (**Table F-10**). The averages for each gear are also less than 5 mutton snapper per crewmember per trip.

Table F-10. Average Numbers of Mutton Snappers Landed per Crewmember per Trip by Gear, If Average Weight is 4.84 lbs gw per Fish, 2010 through 2014.

Year	Average number of mutton snapper per crewmember per trip (all months)							
	Diving outfits, other	By hand, other	Hook & line	Rod & reel	Traps & pots	Troll lines	Other	All gears
2010	1.2	3.9	2.9	3.9		3.9	2.2	3.6
2011	3.4	3.4	4.3	3.5		2.2	4.5	3.7
2012	5.8	3.6	5.2	4.4		3.1	2.4	4.3
2013	3.6	2.6	5.0	4.0		5.1	2.2	3.8
2014	5.7	3.0	4.6	3.2	0.3	2.7	1.6	3.4
Average	4.0	3.3	4.4	3.8	0.3	3.4	2.6	3.8

Preferred Alternative 2 (Sub-alternative 2c) of Action 8 would establish a commercial limit of 500 lbs ww per trip from January through March and July through December every year. There is currently no commercial limit during these months. However, vessels with a 225-lb snapper grouper permit cannot land more than 225 lbs of snapper grouper species in a single trip. Consequently, the 500-lb trip limit (**Preferred Sub-alternative 2c**) would have no impact on any of the small businesses that harvest mutton snapper with vessels that have a 225-lb permit.

From 2010 through 2014, approximately 98.6% of the vessels and 99.6% of the trips with mutton snapper landed no more than 500 lbs ww (450.4 lbs gw) of the species (**Table F-11**). From that it is expected that **Preferred Alternative 2 (Sub-alternative 2c)** would have no impact on approximately 98% of the small businesses that annually land mutton snapper.

Table F-11. Average number of trips and vessels with mutton snapper landings by weight, 2010-2014

Year	Annual average						
	Vessels	Trips		Vessels		Percentage over 500 lbs ww	
		1 to 500 lbs ww	Over 500 lbs ww	1 to 500 lbs ww	Over 500 lbs ww	Trips	Vessels
2010-2014	272	1,497	6	267	5	0.40%	1.84%

Source: SEFSC Online Economic Query System, January 23, 2017.

An average of 5 vessels made 6 trips annually that landed more than 500 lbs ww of mutton snapper from 2010 through 2014. The average loss is estimated to be 425 lbs gw of mutton snapper per trip with a dockside value of \$1,258 (2015 \$). That loss (\$1,258) represents approximately 2.4% of the average vessel’s annual dockside revenue from all landings, which is \$52,739. However, those 5 vessels have annual dockside revenue much greater than the average vessel. Some vessels landed over 1,000 lbs gw and closer to 2,000 lbs gw of mutton snapper per trip during the 5-year period from 2011 through 2015. Whereas, the average vessel landed 38 lbs gw per trip and its annual dockside revenue (2015 \$) from mutton snapper landings was \$641.

Significance of economic impacts on a substantial number of small entities

The adverse impacts of the rule on small commercial fishing businesses are summarized in **Table F-12** below, and it is concluded that this rule would not have a significant economic impact on a substantial number of small entities under the RFA, 5 U.S.C. 601 et seq.

Table F-12. Average Annual Number of Small Businesses and Vessels Affected and Average Annual Cost of Action per Vessel.

Action	Brief description	Average number of small businesses annually affected	Average number of vessels annually affected	Expected average annual adverse impact (2015 \$)	Expected average percentage revenue loss
1	Specify MSY	219	263	No direct impact	
2	Specify MSST	219	263	No direct impact	
3	Revise ACL	219	263	\$0	0%
4	Revise recreational ACT	None			
5	Modify minimum size limit	219	263	\$30.08 per vessel	0.06%
6	Modify length spawning season	219	263	No direct impact	
7	Revise recreational bag limit	None			
8	Modify spawning months trip limit	219	263	\$0	0%
	Establish 500-lb trip limit	215 to 217	259 (98%)	\$0	0%
		3 to 5	5 (2%)	\$1,258 per vessel	Up to 2.4% per vessel

1. Some small businesses operate vessels that use more than one type of gear.
2. Twenty-five vessels use more than one type of gear to harvest mutton snapper.

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. Among other things 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 41 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 41) 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, unless the rule falls within an APA exception, 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 41 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 the actions in this amendment are consistent to the maximum extent practicable with the Coastal Zone Management Plans of Florida, Georgia, South Carolina, and North Carolina. Pursuant to Section 307 of the CZMA, this determination will be submitted

to the responsible state agencies who administer the 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 **Chapter 3**). The opinion stated the fishery was not likely to adversely affect NARW 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.

Regulations implemented through Amendment 15B to the Snapper Grouper FMP (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 opinion, NMFS made several modifications to the list of protected species for which they are responsible. These changes included (1) the listing of two species of *Acropora* coral (71 FR 26852, May 9, 2006), (2) the designation of *Acropora* critical habitat (73 FR 72210, November 26, 2008), (3) the determination that the loggerhead sea turtle population consists of nine DPSs (76 FR 58868, September 22, 2011), (4) the listing of five DPSs of Atlantic sturgeon (77 FR 5914, February 6, 2012, and 77 FR 5880, February 6, 2012), and (5) the listing of five additional coral species (79 FR 53851, September 10, 2014).

NMFS addressed these ESA changes in a series of consultation memoranda. In separate memoranda, NMFS concluded the continued authorization of the South Atlantic snapper grouper fishery is not likely to adversely affect elkhorn or staghorn coral (*Acropora* spp.; July 9, 2007), *Acropora* critical habitat (December 2, 2008), and Atlantic sturgeon (February 15, 2012). The February 15, 2012, memorandum also stated that because the 2006 biological opinion had evaluated the impacts of the snapper-grouper fishery on the loggerhead sea turtle subpopulations now wholly contained within the Northwest Atlantic DPS, the biological opinion's conclusion that the fishery is not likely to jeopardize the continued existence of loggerhead sea turtles remains valid. In a memorandum dated January 23, 2013, NMFS concluded new information provided in the proposed reclassification (uplisting) of *Acropora* did not change the previous effects determination that the fishery was not likely to adversely affect *Acropora*. No new information was included in the final listing rule (79 FR 53851, September 10, 2014) that indicates NMFS's previous effects determinations regarding the potential impacts of the snapper grouper fishery on *Acropora* were incorrect.

The final listing rule published on September 10, 2014, listed 20 new coral species under the ESA. Five of those new species occur in the Caribbean (including Florida) and all of these are listed as threatened. In a memorandum dated September 11, 2014, NMFS evaluated the effects of continued authorization of the snapper grouper fishery on those newly listed coral species. NMFS concluded that any adverse effects on these species from the snapper grouper fishery are extremely unlikely to occur and are therefore discountable.

Additionally, on July 10, 2014, NMFS designated 5 habitat types across 38 marine areas in the Gulf of Mexico and South Atlantic that encompassed the 15 primary constituent elements (PCEs) of critical habitat for the northwest Atlantic Ocean (NWA) loggerhead sea turtle DPS. In a memorandum dated September 16, 2014, NMFS evaluated the potential impacts all federally managed fisheries in the Gulf of Mexico and South Atlantic regions may have on the NWA loggerhead sea turtle DPS critical habitat. The evaluation concluded the snapper-grouper fishery uses fishing methods and gear types that will either have no effect or are highly unlikely to adversely affect any of the PCEs; thus, any adverse effects from this fishery are discountable.

On December 1, 2016, NMFS completed a new biological opinion on the snapper-grouper fishery of the South Atlantic Region. In this biological opinion, NMFS concluded that the snapper grouper fishery's continued authorization is not likely to jeopardize the continued existence of the NARW, loggerhead sea turtle Northwest Atlantic DPSs, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle North Atlantic DPS, green sea turtle South Atlantic DPS, hawksbill sea turtle, smalltooth sawfish U.S. DPS, or Nassau grouper. NMFS concluded that the proposed action is not likely to adversely affect designated critical habitat or other ESA-listed species in the South Atlantic Region. Refer to **Section 3.2.5 (Protected Species)** for more information on species, or DPSs of species, protected by federal law that may occur in the EEZ of the South Atlantic Region, or specific analyses ("Section 7 consultations") conducted by NMFS to evaluate the potential adverse effects from the South Atlantic snapper grouper fishery on species and critical habitat protected under the ESA.

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. 12612 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 RIR as **Appendix E**.

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 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 **Chapters 3 and 4** 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 (MPAs)

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. 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 snapper grouper species are listed as part of a Category III fishery in the proposed List of Fisheries (LOF) for 2017 (81 FR 54019, August 15, 2016) 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 proposed LOF for 2017 (81 FR 54019, August 15, 2016). 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 gear 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 6.03a.2.

Purpose and Need for Action

The purpose and need for this action are described in **Chapter 1**.

Alternatives

The alternatives for this action are described in **Chapter 2**.

Affected Environment

The affected environment is described in **Chapter 3**.

Impacts of the Alternatives

The impacts of the alternatives on the environment are described in **Chapter 4**.

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 three sanctuaries in the South Atlantic exclusive economic zone are the USS Monitor, 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 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.

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

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 Magnuson-Stevens Fishery Conservation and Management Act 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. Essential Fish Habitat and Ecosystem-based Management

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

The South Atlantic Fishery Management Council (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 a 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; maintaining 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 the 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 as 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 and presents more complete and detailed information describing the South Atlantic ecosystem and the impact of fisheries on the environment. This FEP updated information on designated Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern; expanded descriptions of biology and status of managed species; presented information that will support ecosystem considerations for managed species; and described the social and economic characteristics of the fisheries in the region. In addition, it expanded 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. It 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 updated EFH and EFH-HAPC information and addressed the Final EFH Rule (e.g., GIS presented for all EFH and EFH-HAPCs). Management actions implemented in CE-BA 1 established 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.

The Fishery Ecosystem Plan, slated to be revised every 5 years, will again be the vehicle to update and refine information supporting designation and future review of EFH and EFH-HAPCs for managed species. Planning for the update is being conducted in cooperation with the Habitat Advisory Panel during the fall and winter of 2013 with initiation during 2014.

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 addressed non-regulatory updates for existing EFH and EFH- HAPC information and addressed the spatial requirements of the Final EFH Rule (i.e., GIS presented for all EFH and EFH-HAPCs). Actions in this amendment included modifications in the management of the following: octocorals; special management zones (SMZs) off the coast of South Carolina; and sea turtle release gear requirements for snapper grouper fishermen. The amendment also designated essential fish habitat (EFH) and EFH-Habitat Areas of Particular Concern (EFH-HAPCs).

CE-BA 2 established annual catch limits (ACL) for octocorals in the South Atlantic as well as modifying the Fishery Management Unit (FMU) for octocorals to remove octocorals off the coast of Florida from the FMU (SAFMC 2011). The amendment also limited the possession of

managed species in the SMZs off South Carolina to the recreational bag limit for snapper grouper and coastal migratory pelagic species; modified sea turtle release gear requirements for the snapper grouper fishery based upon freeboard height of vessels; amends Council fishery management plans (FMPs) to designate or modify EFH and EFH-HAPCs, including the FMP for Pelagic Sargassum Habitat; amended the Coral FMP to designate EFH for deepwater Coral HAPCs designated under CE-BA 1; and amended the Snapper Grouper FMP to designate EFH-HAPCs for golden and blueline tilefish and the deepwater Marine Protected Areas. The final rule was published in the federal register on December 30, 2011, and regulations became effective on January 30, 2012.

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 development of the FEP and CE-BA as well as coordinate with partners on other regional efforts.

Integrated Ocean Observing System (IOOS) and Southeast Coastal and Ocean Observing Regional Association (SECOORA)

The Integrated Ocean Observing System (IOOS®) is a partnership among federal, regional, academic, and private sector parties that works to provide new tools and forecasts to improve safety, enhance the economy, and protect our environment. IOOS supplies critical information about our Nation's oceans, coasts, and Great Lakes. Scientists working to understand climate change, governments adapting to changes in the Arctic, municipalities monitoring local water quality, and industries affected by coastal and marine spatial planning all have the same need: reliable, timely, and sustained access to data and information that inform decision making. Improving access to key marine data and information supports several purposes. IOOS data sustain national defense, marine commerce, and navigation safety. Scientists use these data to issue weather, climate, and marine forecasts. IOOS data are also used to make decisions for energy siting and production, economic development, and ecosystem-based resource management. Emergency managers and health officials need IOOS information to make decisions about public safety. Teachers and government officials rely on IOOS data for public outreach, training, and education.

SECOORA is one of 11 Regional Associations established nationwide through the US IOOS whose primary source of funding is through a 5-year cooperative agreement titled "Coordinated Monitoring, Prediction, and Assessment to Support Decision-Makers Needs for Coastal and Ocean Data and Tools". However, SECOORA was recently awarded funding via a NOAA Regional Ocean Partnership grant through the Governors' South Atlantic Alliance. SECOORA is the regional solution to integrating coastal and ocean observing data in the Southeast United States to inform decision makers and the general public. The SECOORA region encompasses 4 states, over 42 million people, and spans the coastal ocean from North Carolina to the west Coast of Florida and is creating customized products to address these thematic areas: Marine Operations; Coastal Hazards; Ecosystems, Water Quality, Living Marine Resources; and Climate Change. The Council is a voting member and Council staff was recently re-elected to serve on the

Board of Directors for 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 assessments 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 with information included in the Council's Habitat and Ecosystem Web Services and Atlas to facilitate model and tool development.
- Expanding Map Services and the Regional Habitat and Ecosystem Atlas in cooperation with SECOORAs Web Services that will provide researchers access to data or products including those collected/developed by SA OOS partners.

SECOORA researchers are developing a comprehensive data portal to provide discovery of, access to, and metadata about coastal ocean observations in the southeast US. Below are various ways to access the currently available data.

One project recently funded by SECOORA initiated development of species specific habitat models that integrate remotely sensed and in situ data to enhance stock assessments for species managed by the Council. The project during 2013/2014 was initiated to address red porgy, gray triggerfish, black seabass, and vermilion snapper. Gray triggerfish and red porgy are slated for assessment through SEDAR in 2014/15 and 2015/16 respectively.

National Fish Habitat Plan and Southeast Aquatic Resource Partnership (SARP)

In addition, the Council serves on the National Habitat Board and, as a member of the Southeast Aquatic Resource Partnership (SARP), has highlighted this collaboration by including the Southeast Aquatic Habitat Plan (SAHP) 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. To date, SARP has funded 53 projects in the region through this program. This work supports conservation objectives identified in the SAHP to improve, establish, or maintain riparian zones, water quality, watershed connectivity, sediment flows, bottoms and shorelines, and fish passage, and addresses other key factors associated with the loss and degradation of fish habitats. SARP

also developed the Southern Instream Flow Network (SIFN) to address the impacts of flow alterations in the Southeastern US aquatic ecosystems which leverages policy, technical experience, and scientific resources among partners based in 15 states. Maintaining appropriate flow into South Atlantic estuarine systems to support healthy inshore habitats essential to Council managed species is a major regional concern and efforts of SARP through SIFN are envisioned to enhance state and local partners ability to maintain appropriate flow rates.

Governor's South Atlantic Alliance (GSAA)

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 (GSAA). This will also provide regional guidance and resources that will address State and Council broader habitat and ecosystem conservation goals. The GSAA 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. The Alliance's 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. The GSAA Action Plan was released in December 2010 and describes the four Priority Issue Areas that were identified by the Governors to be of mutual importance to the sustainability of the region's resources: Healthy Ecosystems; Working Waterfronts; Clean Coastal and Ocean Waters; and Disaster-Resilient Communities. The goals, objectives, actions, and implementation steps for each of these priorities were further described in the GSAA Implementation Plan released in July 2011. The final Action Plan was released on December 1, 2010 and marked the beginning of intensive work by the Alliance Issue Area Technical Teams (IATTs) to develop implementation steps for the actions and objectives. The GSAA Implementation Plan was published July 6, 2011, and the Alliance has been working to implement the Plan through the IATTs and two NOAA-funded Projects. The Alliance also partners with other federal agencies, academia, non-profits, private industry, regional organizations, and others. The Alliance supports both national and state-level ocean and coastal policy by coordinating federal, state, and local entities to ensure the sustainability of the region's economic, cultural, and natural resources. The Alliance has organized itself around the founding principles outlined in the GSAA Terms of Reference and detailed in the GSAA Business Plan. A team of natural resource managers, scientists, and information management system experts have partnered to develop a Regional Information Management System (RIMS) and recommend decision support tools that will support regional collaboration and decision-making. In addition to regional-level stakeholders, state and local coastal managers and decision makers will also be served by this project, which will enable ready access to new and existing data and information. The collection and synthesis of spatial data into a suite of visualization tools is a critical step for long-term collaborative planning in the South Atlantic region for a wide range of coastal uses. The Council's Atlas presents the spatial representations of Essential Fish Habitat, managed areas, regional fish and fish habitat

distribution, and fishery operation information and it can be linked to or drawn on as a critical part of the collaboration with the RIMS.

South Atlantic Landscape Conservation Cooperative

One of the more recent collaborations is the Council's participation as Steering Committee member for the newly established 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.

The SALCC developed a Strategic Plan through an iterative process that began in December 2011. The plan provides a simple strategy for moving forward over the next few years. An operations plan was developed under direction from the SALCC Steering Committee to redouble efforts to develop version 1.0 of a shared conservation blueprint by spring-summer of 2014. The SALCC is developing the regional blueprint to address the rapid changes in the South Atlantic including but not limited to climate change, urban growth, and increasing human demands on resources which are reshaping the landscape. While these forces cut across political and jurisdictional boundaries, the conservation community does not have a consistent cross-boundary, cross-organization plan for how to respond. The South Atlantic Conservation Blueprint will be that plan. The blueprint is envisioned to be a spatially-explicit map depicting the places and actions need to sustain South Atlantic LCC objectives in the face of future change. The steps to creating the blueprint include development of: indicators and targets (shared metrics of success); the State of the South Atlantic (past, present, and future condition of indicators); and a Conservation Blueprint. Potential ways the blueprint could be used include: finding the best places for people and organizations to work together; raising new money to implement conservation actions; guiding infrastructure development (highways, wind, urban growth, etc.); creating incentives as an alternative to regulation; bringing a landscape perspective to local adaptation efforts; and locating places and actions to build resilience after major disasters (hurricanes, oil spills, etc.). Integration of connectivity, function, and threats to river, estuarine and marine systems supporting Council managed species is supported by the SALCC and enhanced by the Council being a voting member of its Steering Committee. In addition, the Council's Regional Atlas presents spatial representations of Essential Fish Habitat, managed areas, regional fish and fish habitat distribution, and fishery operation information and it be linked to or drawn on as a critical part of the collaboration with the recently developed SALCC Conservation Planning Atlas.

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). 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 evolved, the distribution and use of GIS demands greater capabilities. The Council has continued its collaboration with FWRI in the now evolution to Web Services provided through the regional SAFMC Habitat and Ecosystem Atlas (http://ocean.floridamarine.org/safmc_atlas/) and the SAFMC Digital Dashboard (http://ocean.floridamarine.org/safmc_dashboard/). The Atlas integrates services for the following:

Species distribution and spatial presentation of regional fishery independent data from the SEAMAP-SA, MARMAP, and NOAA SEFIS systems; SAFMC Fisheries: (http://ocean.floridamarine.org/SA_Fisheries/)

Essential Fish Habitat and Essential Fish Habitat Areas of Particular Concern; SAFMC EFH: (http://ocean.floridamarine.org/sa_efh/)

Spatial presentation of managed areas in the region; SAFMC Managed Areas: (http://ocean.floridamarine.org/safmc_managedareas/)

An online life history and habitat information system supporting Council managed, State managed, and other regional species was developed in cooperation with FWRI. The Ecospecies system is considered dynamic and presents, as developed, detailed individual species life history reports and provides an interactive online query capability for all species included in the system: <http://atoll.floridamarine.org/EcoSpecies>

Web Services System Updates:

Essential Fish Habitat (EFH) – displays EFH and EFH-HAPCS for SAFMC managed species and NOAA Fisheries Highly Migratory Species.

Fisheries - displays Marine Resources Monitoring, Assessment, and Prediction (MARMAP) and Southeast Area Monitoring and Assessment Program South Atlantic (SEAMAP-SA) data.

Managed Areas - displays a variety of regulatory boundaries (SAFMC and Federal) or management boundaries within the SAFMC’s jurisdiction.

Habitat – displays habitat data collected by SEADESC, Harbor Branch Oceanographic Institute (HBOI), and Ocean Exploration dives, as well as the SEAMAP shallow and ESDIM deepwater bottom mapping projects, multibeam imagery, and scientific cruise data.

Multibeam Bathymetry - displays a variety of multibeam data sources and scanned bathymetry charts.

Nautical Charts – displays coastal, general, and overview nautical charts for the SAFMC’s jurisdictional area.

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 tools including Special Management Zones. Pursuant to development of the

Comprehensive Ecosystem-Based Amendment, the Council has taken 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 in 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 a source document to the CE-BAs. NOAA should support and build on the 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, which has served as the source document for CE-BAs, could also meet some of the 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;
5. Marine aquaculture;
6. Marine Ecosystems and Non-Native and Invasive Species; and
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. 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.

The Habitat and Environmental Protection Advisory Panel, as part of their role in providing continued policy guidance to the Council, is during 2013/14, reviewing and proposing revisions and updates to the existing policy statements and developing new ones for Council consideration. The effort is intended to enhance the value of the statements and support cooperation and collaboration with NOAA Fisheries Habitat Conservation Division and State and Federal partners in better addressing the Congressional mandates to the Council associated with designation and conservation of EFH in the region.

South Atlantic Bight Ecopath Model

The Council worked cooperatively with 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, only with significant investment of new resources through other programs will a comprehensive regional model be further developed.

The latest collaboration builds on the previous Ecopath model developed through the Sea Around Us project for the South Atlantic Bight with a focus on beginning a dialogue on the implications of potential changes in forage fish populations in the region that could be associated with environmental or climate change or changes in direct exploitation of those populations.

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 was 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 2,000 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) designated 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.

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

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 and 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 these 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 foraminiferan 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) 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 waters to 30 m depth; subtropical (15°-35° C), oligotrophic waters with high (30-35‰) 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‰) 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) designated 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, and 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 at that time).

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 at that time).

Pelagic *Sargassum* Habitat FMP

The Council through CEBA 2 (SAFMC 2011) designated 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; bottom longlines in the wreckfish fishery; 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.
- Established 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

- 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 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 five deepwater CHAPCs:
Cape Lookout Lophelia Banks CHAPC;
Cape Fear Lophelia Banks CHAPC;
Stetson Reefs, Savannah and East Florida Lithoherms, and Miami Terrace (Stetson- Miami Terrace) CHAPC;
Pourtales Terrace CHAPC; and
Blake Ridge Diapir Methane Seep CHAPC.
- Within the deepwater CHAPCs, the possession of coral species and the use of all bottom damaging gear are 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 a number of habitat policy statements which are available on the Habitat and Ecosystem section of the Council website (<http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx>).

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Appendix I. Fishery Impact Statement

The Magnuson-Stevens Fishery Conservation and Management Act requires a FIS be prepared for all amendments to Fishery Management Plans (FMPs). The FIS contains an assessment of the likely biological, social, and economic 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 41 to the Snapper Grouper FMP (Amendment 41)

The Comprehensive Annual Catch Limit Amendment (SAFMC 2011) established a jurisdictional allocation between the South Atlantic Fishery Management Council (South Atlantic Council) and Gulf of Mexico Fishery Management (Gulf Council) Councils for the mutton snapper acceptable biological catch (ABC). The jurisdictional allocation was based on the Florida Keys (Monroe County) jurisdictional boundary between the Gulf and South Atlantic Councils. The South Atlantic Council was allocated 82% of the ABC and the Gulf Council received 18% of the ABC (established using 50% of average landings from 1990-2008 + 50% of average landings from 2006-2008). The SSC reviewed the results at their April 28-30, 2015 meeting and made fishing level recommendations for mutton snapper in the South Atlantic and Gulf of Mexico.

An update to the Southeast Data, Assessment, and Review (SEDAR) for mutton snapper in the southeastern U.S. was conducted in 2015 with data through 2013 (SEDAR 15A Update 2015). The SEDAR 15A Update (2015) resulted in lower biological reference point values and fishing level projections than those from the original assessment (SEDAR 15A 2008). The methodologies used in the two assessments are very different, making direct comparisons difficult. A few items were noted that could have contributed to the differences: the Marine Recreational Information Program calibrated landings used in the update are very different (especially in the early years of the time series) from the landings stream in the original assessment. Also, the update included several more years of data (7 years) than what a typical update usually includes. In addition, the original assessment was done with few samples for growth and reproductive parameters. In short, there are probably numerous factors contributing to the difference in the reference points and the projected levels of catch. Due to the life history of mutton snapper, there can be hyper-stability in the indices of abundance; that is, because the bulk of the landings occur in May and June when mutton snapper are aggregated to spawn, the catch per unit effort fluctuates little. This may lead to the false assumption that catches are sustainable over the long term. Also, this type of harvest affects recruitment and proactive management measures may be needed to prevent overfishing. However, for the South Atlantic stock, the stock assessment results showed the stock is not *undergoing overfishing and is not overfished*.

Amendment 41 includes actions that evaluate: modifying management benchmarks and allowable fishing levels for mutton snapper; designating the “spawning months,” (during which

stricter regulations may apply); and modifying the minimum size limit, recreational bag limit, and commercial trip limit for mutton snapper.

Assessment of Biological Effects

The actions modifying maximum sustainable yield (MSY) and minimum stock size threshold (MSST) for mutton snapper are expected to have positive biological impacts to the environment. These definitions are based on the most recent stock assessment (SEDAR 15A Update 2015) and the best available scientific information reviewed by the South Atlantic Council's Scientific and Statistical Committee (SSC), thereby recommending the best protection for the resource.

The actions to revise sector optimum yield (OY), annual catch limits (ACLs) and recreational annual catch targets (ACTs) would have positive effects to the mutton snapper stock and associated ecosystem. The specification of targets and limits, in the form of ACLs and ACTs, are crucial components of any management program involving natural resources. Without the designation of these components, regulations may not be sufficient to prevent overfishing. The Council would manage towards a biological benchmark based on scientific advice from the SSC, in the form of an ABC level. The specification of an ABC would protect fishery resources to allow sustainable exploitation because it follows the Council's ABC control rule and accounts for scientific uncertainty. Sustainable exploitation would allow the existence of an appropriate number of older, larger fishes in the population; a robust population provides additional protections against recruitment failure due to several years of poor environmental conditions for eggs and larvae. Furthermore, the OY, ACLs and recreational ACTs chosen by the Council include management uncertainty buffers that would provide additional protection to the mutton snapper stocks.

The actions to specify management measures (modifying the minimum size limit, recreational bag limit, and commercial trip limit) would be expected to have neutral biological effects because ACLs and accountability measures (AMs) would be in place to cap harvest, and take action if ACLs are exceeded.

The action to designate spawning months for regulatory purposes would be expected to be neutral because fishing would occur outside of the spawning season, and ACLs and AMs would ensure overfishing does not occur.

Assessment of Economic Effects

Snapper Grouper Amendment 41 contains many actions that may affect future fishing behavior and thus create economic effects. Nearly all of the actions could be analyzed as if they were stand-alone, however the various actions when combined may only have incremental economic effects and can therefore be grouped for analysis purposes. Three separate cumulative analyses are presented to assess the anticipated economic effects in the amendment and are broken into actions that are not anticipated to have economic effects, actions that may affect the recreational sector, and actions that may affect the commercial sector. These analyses are additive and determine the total estimated economic effects for the amendment.

The actions that specify MSY, specify MSST, revise ACLs and OY, and revise the recreational ACT are not anticipated to have any direct economic effects on fishery participants and associated industries or communities. These actions do not directly alter the harvest of mutton snapper nor are they expected to affect fishing behavior from the status quo.

For the recreational sector, the actions that modify the minimum size limit for mutton snapper paired with modifying the recreational bag limit are expected to produce direct economic effects in the sector. The initial decrease in fish available for harvest due to a size limit increase could negatively affect consumer surplus. Net operating revenue for charter and head boat trips may be also negatively affected as well if overall fishing effort decreases or trips become more costly due to higher search costs. However, an increase in the minimum size limit could also result in greater long-term positive economic effects as long as increased size limits translate into a larger spawning stock biomass and overall biomass increasing above the minimum limit. The bag limit reduction is expected to have a much less constraining effect on recreational participants, as anglers tend to land fewer than five mutton snapper per person on a single trip. Therefore, setting the bag limit at 5 fish per person per day would have little effect in constraining recreational harvest on its own in most cases and is expected to have relatively minor negative economic effects compared to a change in the minimum size limit. Cumulatively in the recreational sector, modifying the minimum size limit paired with modifying the recreational bag limit is expected to result in a short-term decrease in consumer surplus ranging from \$759,785 to \$1,858,958 (2015 dollars), depending on the marginal consumer surplus estimate used for the value of a mutton snapper.

For the commercial sector, the actions that modify the minimum size limit, designate spawning months, establish a commercial trip limit during the “regular season”, and modify the commercial trip limit during the “spawning months” are expected to produce direct economic effects in the sector. In addition to reducing the number of fish available to harvest, size limits can increase the number of discarded fish and trip costs if a vessel takes longer or more trips to mitigate reduced landings per trip. An expansion of the current spawning season restrictions that limits the number of mutton snapper that can be landed per trip potentially decreases the profitability of some commercial trips as well. This could negatively affect the profitability of a fishing trip and/or the overall annual profitability of a commercial fishing business.

Trip limits may reduce profitability for commercial vessels on some trips through a reduction in revenue and efficiency. The effects of the proposed trip limit during the regular season is expected to be minimal on most trips, as the vast majority of commercial trips land 500 pounds or less of mutton snapper per trip, however negative economic effects are still likely to occur on some commercial trips. Implementing more strict trip limits during the designated spawning months may have heightened negative economic effects for some commercial fishing operations as well. The realized severity of such effects on a commercial trip would be based on the overall dependence a vessel has on mutton snapper, the ability of the vessel to exceed the current trip limit specified during the spawning months, and the vessel’s ability to substitute other species to make up for the loss of revenue from reduced mutton snapper landings. Presumably the short-term negative economic effects of a size limit increase, trip limits, and spawning season restrictions may be offset if the biomass of mutton snapper improves and additional fish are available to harvest and sell. Cumulatively in the commercial sector, the combined short-term

effects of modifying the minimum size limit, designating spawning months, establishing a commercial trip limit during the “regular season”, and modify the commercial trip limit during the “spawning months” are to decrease the ex-vessel value of mutton snapper landings by \$36,562 (2015 dollars).

The overall net direct short-term negative economic effects are expected to be between \$796,347 and \$1,895,520 (in 2015 dollars) in 2017 for both sectors combined.

Assessment of Social Effects

The actions in the amendment stem from a recent stock assessment update for South mutton snapper in addition to concern about harvest during spawning. The actions will update mutton management to align with the most recent information from the assessment update and make changes to management measures to help reduce the potential negative effects on the stock from harvest. The effects of the proposed actions will likely affect communities and fishermen in the Florida Keys by restricting some access to mutton snapper or limiting the number of fish that can be landed. The proposed changes may have both positive and negative effects on fishermen and coastal communities. In general, the benefits would be long-term, and would be associated with the biological benefits that result from sustainable harvest of the mutton snapper stock.

The suite of actions that will update the biological parameters and annual catch limit based on the recent stock assessment is expected to be beneficial to fishermen and communities by aligning management with the best available information. The proposed annual catch limits are not expected to constrain the commercial or recreational fishery because landings in recent years have been below the proposed annual catch limits. However, if there is growth in the fishery due to closures for other stocks or other factors that increase effort for mutton snapper, the proposed annual catch limits and associated accountability measures may have negative effects on fishermen in the future.

For recreational fishermen who target mutton snapper, the proposed changes to the minimum size limit and harvest limits may have some negative effects on trip satisfaction by restricting the number of mutton snapper that can be landed. However, the proposed measures may also help to keep the recreational harvest at sustainable levels and maintain a healthy stock.

The effects of the proposed management changes for commercial harvest is also expected to have some negative effects on commercial fishermen who target mutton snapper, but that these effects will be minimal. It is likely that fishermen who target mutton snapper also target other species at higher levels and under current conditions, commercial trips would not be affected by the proposed measures. It is expected that commercial fishermen will be able to adjust their businesses to adapt to regulatory changes.

Overall, the actions in this amendment may have some negative effects on recreational and commercial fishing opportunities, but long-term social benefits will be expected as management aligns with the best available science from the recent stock assessment, and proactive measures are implemented to constrain harvest before there is a problem with the mutton snapper stock.

Appendix J. Method for Specifying the Mutton Snapper OFL, ABC, and ACL in Numbers of Fish

Dr. Mike Errigo and Chip Collier
South Atlantic Fishery Management Council
Updated March 2, 2016

At the Council's request, Amendment 41 specifies the proposed recreational ACL for mutton snapper in numbers of fish (converted from pounds using average weight) and the commercial ACL in pounds. Issues develop, however, when different size limits are considered for management and the commercial and recreational ACLs are in different units: if the minimum size limit is increased, as the Council proposes to do, the average size and thus weight of fish harvested will also increase. If the method for converting between an ACL in pounds and an ACL in numbers does not address the change in average weight, the expected increase in the average weight of landed fish could lead to the poundage associated with the ACL specified in numbers exceeding the ACL expressed in pounds. This could also result in a perceived shift in allocations when they are compared in the original units across sectors, and if the change in weight landed is great enough, the ABC and OFL in pounds could be exceeded.

The assumption made above is that the conditions input to the model used in projections (certain level of recruitment, selectivity, natural mortality, productivity, etc.) will remain consistent in the fishery after the implementation of Amendment 41, including the change in the minimum size limit. If this assumption is correct, then exceeding the yield of the ABC and OFL in pounds would result in overfishing. However, once the minimum size limit change is implemented by Amendment 41, the selectivity and resulting yield per recruit (YPR) may change from the assumed levels that were input to the model. Therefore, the yield in pounds from fishing at F_{target} will be higher with a higher average fish size. Since the recreational fishery is currently harvesting mutton snapper at an average size below the Council's preferred minimum size limit of 18 inches (18 inches on average 2010-2014) and about half of the harvested fish are currently below this preferred minimum size, there is a good chance that implementing the preferred minimum size limit will change the selectivity of the recreational fishery.

The most appropriate method to address changes in management measures, such as size limits, that affect fishery selectivity is to update the management parameters, such as MSY and F_{MSY} along with projections of yield and stock size, to reflect the expected selectivity patterns. This is very important because estimates of stock productivity are linked to selectivity and will change when a management action affects future selectivity. Council staff had initial discussions with FWC about the potential to rerun the projections and update productivity measures with selectivity consistent with the proposed size limit

increase. However, this will require some modifications to the assessment program. Since SEDAR 15A update was conducted using the SS3 assessment model, which is highly complex and there is no one in the region qualified to perform the type of code modification required on the fly, the timing, including review by the SSC for acceptance prior to use, will not fit the statutory timeline for Amendment 41. We will pursue having this modification made for future assessments or updates.

Council staff developed a modified YPR model to investigate the effects of changes in the minimum size on fishing mortality (F) (refer to briefing materials for March 4, 2016 SSC webinar for the YPR model: <http://safmc.net/ssc-meeting-briefing-book-march-4-2016/>). The intent was to investigate whether a higher yield could be taken by the fishery, while harvesting the same number of fish, and still not result in overfishing. The results of the modified YPR indicate that the fishery could continue to harvest the same number of fish up to the 20" proposed minimum size alternative with little to no effect on the value of F. This is because F is based on numbers killed, so alternatives with the same number of fish killed will have similar F values when you consider F over the same range of ages in all the alternatives. Therefore, the recreational fishery can harvest a higher poundage of mutton snapper without causing the stock to undergo overfishing.

One method of addressing the change in selectivity due to the change in the minimum size limit would be to specify the OFL, ABC, and ACLs in numbers of fish; however, current sector allocations are based on landings in pounds, so allocations could be impacted if ratios derived from pounds are simply applied to fishing levels expressed in numbers. For the method proposed here, the OFL and ABC are specified in numbers and each value has an associated yield in pounds based on average weight from the stock assessment projections (**Tables 1-3**). The associated yield in pounds is used to calculate the allocation but is not used for calculating or tracking harvest in the recreational sector. The commercial sector's allocation is calculated in both pounds and numbers; therefore, either can be used to track the harvest for that sector. However, the ABC would still be specified in numbers of fish. A stepwise process to derive the sector ACLs could be:

1. Calculate the total ACL
 - If $ABC=ACL$, then the total ACL in numbers is provided directly as output from the projections from the stock assessment (**Table 1**).
 - If there is an uncertainty buffer between ACL and ABC, then reduce the ABC (numbers) by the uncertainty buffer to get total ACL (numbers, **Tables 2-3**).
2. Allocate the total ACL- This step allocates the ACL between sectors using the status quo method used for all other stocks managed in the South Atlantic. Using the associated yield (pounds) for the ABC or yield with uncertainty buffer included, calculate the allocation for each sector based on the formula derived in the Comprehensive ACL Amendment. Commercial allocation is 17.02% based on weight and recreational allocation is 82.98% based on weight for mutton snapper.

3. Convert the commercial allocation from pounds to numbers - Divide the commercial sector allocation in pounds by the average weight of commercially-caught mutton snapper. The average weight of commercially-caught mutton snapper is 7.68 lbs. (Source: Average of gear-specific average weights from the most recent assessment weighted by the commercial landings in number by gear, Mike Errigo).
 - At this step the commercial allocation has now been calculated in both pounds and numbers and either can be used as the final commercial ACL, depending on the preference of the Council. If pounds are chosen, the ABC will still need to be tracked in numbers, requiring the commercial landings to be converted into numbers at some point.
4. Calculate the Recreational ACL (numbers) - Subtract the commercial allocation in numbers from the total ACL in numbers.

Some benefits of calculating the ACL using this method and specifying the OFL and ABC in numbers include:

- The ABC is not exceeded due to changes in the minimum size and average weights.
- Continues to use the standard method to calculate sector allocations.
- The recreational fishery is tracked in its native units.
- The recreational ACL remains constant in Amendment 41 regardless of what minimum size limit is proposed.
- The harvest reductions needed to rebuild the stock will reduce the number of potential weight observations through the MRIP program, making estimation of landings in weight even more unreliable than they already are for a rarely encountered species. Therefore, uncertainty is reduced by setting the OFL, ABC, and ACL in numbers and tracking the landings in numbers.
 - On average from 2010-2014, 289 mutton snapper a year are observed (Type A catch) through the MRIP survey in this stock, but only 215 of those are weighed (74.4%).
- The numbers of fish measured in the commercial fishery greatly exceeds the number measured in the recreational fishery (Rec: 0.18% of catch, Comm: 1.42% of catch, Comm samples 8 times more of the catch than Rec); therefore, we are using the dataset with less uncertainty to convert from weight to numbers.
- The average size of commercially caught mutton snapper already exceeds the average size of fish under the preferred size limit and might not shift as much as the recreational fishery likely will.
- Evidence suggests that even if the average weight of landed fish does increase due to an increase in the minimum size that overfishing will not occur.

Issues to consider:

- The associated yield in pounds of the ACL in numbers can exceed the SSC approved ABC in pounds if the average weight of landed fish increases due to an increase in the minimum size limit. However, the modified YPR analysis developed by Council staff shows that the yield in pounds from fishing at F_{target} will be higher with a higher average fish size.

- Realized allocation may shift in weight. Allocation in weight will be dependent on average weight estimated for the fisheries. Amendment 41 uses an average weight value of 1.85 lbs. for recreationally caught mutton snapper, which is slightly above the average weight of a 12-inch mutton snapper. It is not known what the recreational average weight of mutton snapper will be under different size limits and how it will change over time. However, this is an issue whenever the ACL for a sector is set in numbers and the allocation is calculated in pounds regardless of the units of the ABC.

This method, developed by Council staff, is designed to keep the numbers of fish harvested constant while allowing the yield to vary based on the possible change in selectivity due to changes in the minimum size limit. Yields above the SSC-approved projections in pounds are possible, but the results of the YPR model developed by Council staff show that as long as the number of fish does not exceed the projected landings then overfishing will not be occurring. This proposed method also is consistent with the allocation formula currently in use, which relies on landings in pounds to calculate the sector allocations. The method proposed by SERO staff for calculating the recreational ACL of mutton snapper reduces the number of fish harvested in the recreational sector based on average weight of fish at different size limits and does not consider changes in selectivity due to changes in the minimum size limit. Until a new assessment or new projections can be run to account for changes in selectivity due to changes in the minimum size, Council staff proposes this method of specifying the OFL and ABC in numbers and allowing the yield to vary based on changes in selectivity as an interim method for setting the recreational ACL of mutton snapper.

Table 1. Proposed ABC and ACLs for mutton snapper. This example is for **Preferred Sub-alternative 2a** in **Action 3** (ACL=OY=ABC). The average weight is estimated by the stock assessment model. The average weight of commercially caught mutton snapper is 7.68 lbs. based on commercial samples.

New Proposed Method To Calculate Mutton snapper ACL Using Only Comm Avg Wt							
Year	Total ABC	SA ABC	Model Proj Avg Wt	Yield of ABC	Yield of Comm ACL	Comm ACL	Rec ACL
	(number)	(number)	(lbs/fish)	(pounds)	(pounds)	(number)	(number)
2017	157,500	129,150	4.55	587,633	100,015	13,023	116,127
2018	164,500	134,890	4.54	612,401	104,231	13,572	121,318
2019	169,300	138,826	4.57	634,435	107,981	14,060	124,766
2020	172,700	141,614	4.62	654,257	111,354	14,499	127,115

Table 2. Proposed ABC and ACLs for mutton snapper. This example is for **Sub-alternative 2b** in **Action 3** (ACL=OY=95% ABC). The average weight is estimated by the stock assessment model. The average weight of commercially caught mutton snapper is 7.68 lbs. based on commercial samples.

New Proposed Method To Calculate Mutton snapper ACL Using Only Comm Avg Wt							
Year	Total ABC	SA ABC	Model Proj Avg Wt	Yield of ABC	Yield of Comm ACL	Comm ACL	Rec ACL
	(number)	(number)	(lbs/fish)	(pounds)	(pounds)	(number)	(number)
2017	157,500	122,693	4.55	558,251	95,014	12,372	110,321
2018	164,500	128,146	4.54	581,781	99,019	12,893	115,252
2019	169,300	131,885	4.57	602,713	102,582	13,357	118,528
2020	172,700	134,533	4.62	621,544	105,787	13,774	120,759

Table 3. Proposed ABC and ACLs for mutton snapper. This example is for **Sub-alternative 2c** in **Action 3** (ACL=OY=90% ABC). The average weight is estimated by the stock assessment model. The average weight of commercially caught mutton snapper is 7.68 lbs. based on commercial samples.

New Proposed Method To Calculate Mutton snapper ACL Using Only Comm Avg Wt							
Year	Total ABC	SA ABC	Model Proj Avg Wt	Yield of ABC	Yield of Comm ACL	Comm ACL	Rec ACL
	(number)	(number)	(lbs/fish)	(pounds)	(pounds)	(number)	(number)
2017	157,500	116,235	4.55	528,869	90,014	11,721	104,514
2018	164,500	121,401	4.54	551,161	93,808	12,215	109,186
2019	169,300	124,943	4.57	570,991	97,183	12,654	112,289
2020	172,700	127,453	4.62	588,831	100,219	13,049	114,403

Appendix K. Recreational and Commercial Data Analyses of Management Alternatives

Recreational Data Analysis of Management Alternatives

Dr. Mike Errigo, SAFMC Staff

INTRODUCTION

Amendment 41 to the Snapper Grouper FMP contains actions to address the 2015 update assessment for Mutton Snapper conducted by the FL Fish and Wildlife Commission (FWC). The South Atlantic Fishery Management Council (SAFMC) is proposing actions to update the stock biological reference points and the catch level recommendations for Mutton Snapper in response to the FL FWC update assessment. The update assessment predicted a drop in the Acceptable Biological Catch (ABC) of the stock from what was estimated in the previous benchmark; therefore the SAFMC is also considering changes to the management measures for Mutton Snapper in its jurisdiction.

This document describes the analyses conducted of the potential effects of the proposed recreational management measures on recreational harvest of Mutton Snapper in the South Atlantic (SA). Recreational management measure alternatives include adjustments to the timing of the spawning season, recreational bag limit, and recreational size limit for Mutton Snapper.

DATA

Trip level data was used from the Marine Recreational Information Program (MRIP) and the Southeast Regional Headboat Survey (SRHS) to conduct the analyses. The years 2010 to 2014 were included. All analyses were conducted using numbers of fish, since the SAFMC has specified the new recreational ACL will be in numbers rather than in weight. The analyses described here deal with landings data, which is defined as fish that are kept by the angler. The MRIP program defines landings as consisting of types A and B1 fish, which are described below.

MRIP

The MRIP data includes both private recreational trips and charter trips. These data were for trips intercepted by MRIP interviewers, which is only a small portion of the total Mutton Snapper trips (~0.22%). Data were available at the trip level and included number of fish observed (by the interviewer, type A), number of fish killed but not observed (type B1), number of fish discarded (type B2), the number of anglers on board, the date of the intercept, the kind of day (weekend vs. weekday), the length of each fish, and the expansion factor used to expand the landings and discards of each trip up to the total landings and discards for the entire South Atlantic based on the estimated fishing effort. For kind of day, holidays were included as weekends. During the time period used in this

analysis, the landings attributed to MRIP make up approximately 88.5% of the total recreational Mutton Snapper landings in the SA.

Since Mutton Snapper is part of the Aggregate Snapper bag limit, an analysis was conducted to look at what proportion of trips was reaching the aggregate bag limit. From 2010 to 2014, only 3 trips were intercepted in the SA that reached the Aggregate Snapper bag limit. On those trips, the dominant species in the landings was Yellowtail Snapper. On average, there were about 9 Yellowtail Snapper for every Mutton Snapper on those 3 trips. Since so few trips reached the Aggregate Snapper bag limit, and since the SAFMC is only considering reductions in the number of Mutton Snapper that can be retained in the Aggregate Snapper bag limit, the analysis was conducted using only the landings data of Mutton Snapper. This assumption was carried through to the SRHS data.

As mentioned above, data from 2010 to 2014 were used to perform the analysis. Figure 1 shows the MRIP landings for each of the years included in the analysis, which range from ~48,000 fish to ~140,000 fish. The average landings across the years for each month were used to predict potential reductions due to changes in management measures (Figure 2). The size composition of the MRIP landings shows that a large proportion of the landed fish are at or below the current 16 inch minimum size in most years and for areas north of the FL Keys (Figure 3Figure 4).

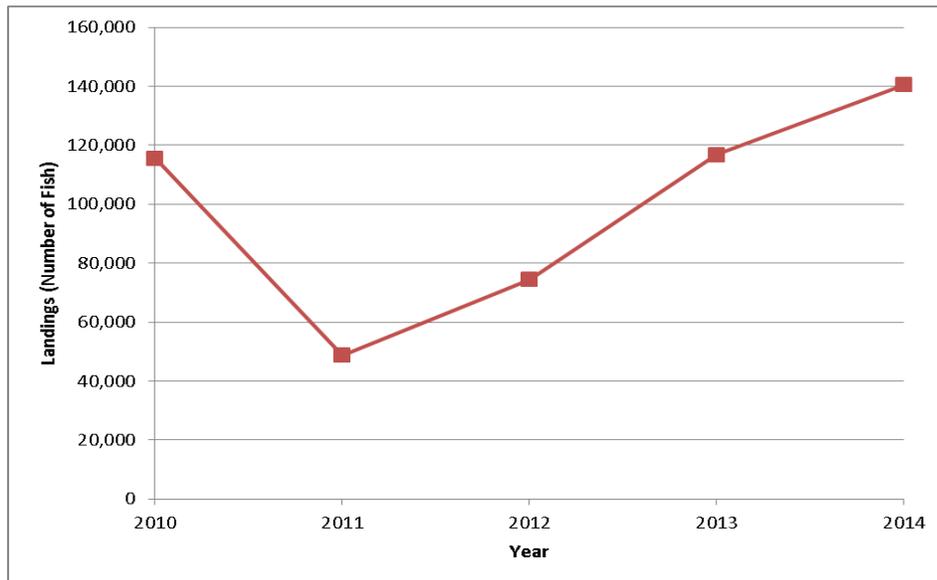


Figure 1. Total yearly MRIP landings of Mutton Snapper in the SA.

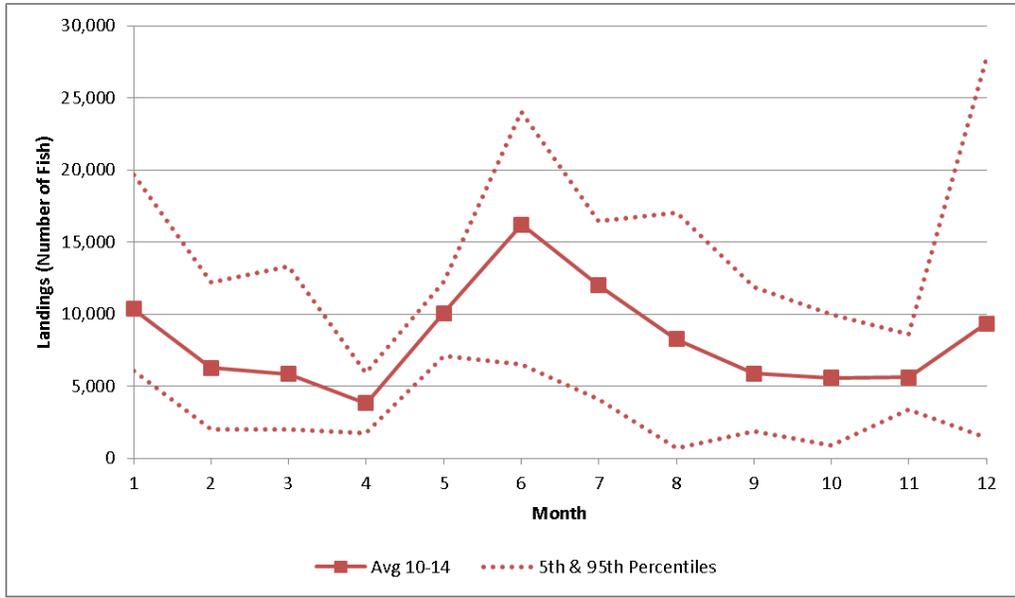


Figure 2. Monthly MRIP landings of Mutton Snapper in the SA averaged from 2010 to 2014, with 5th and 95th percentile lines.

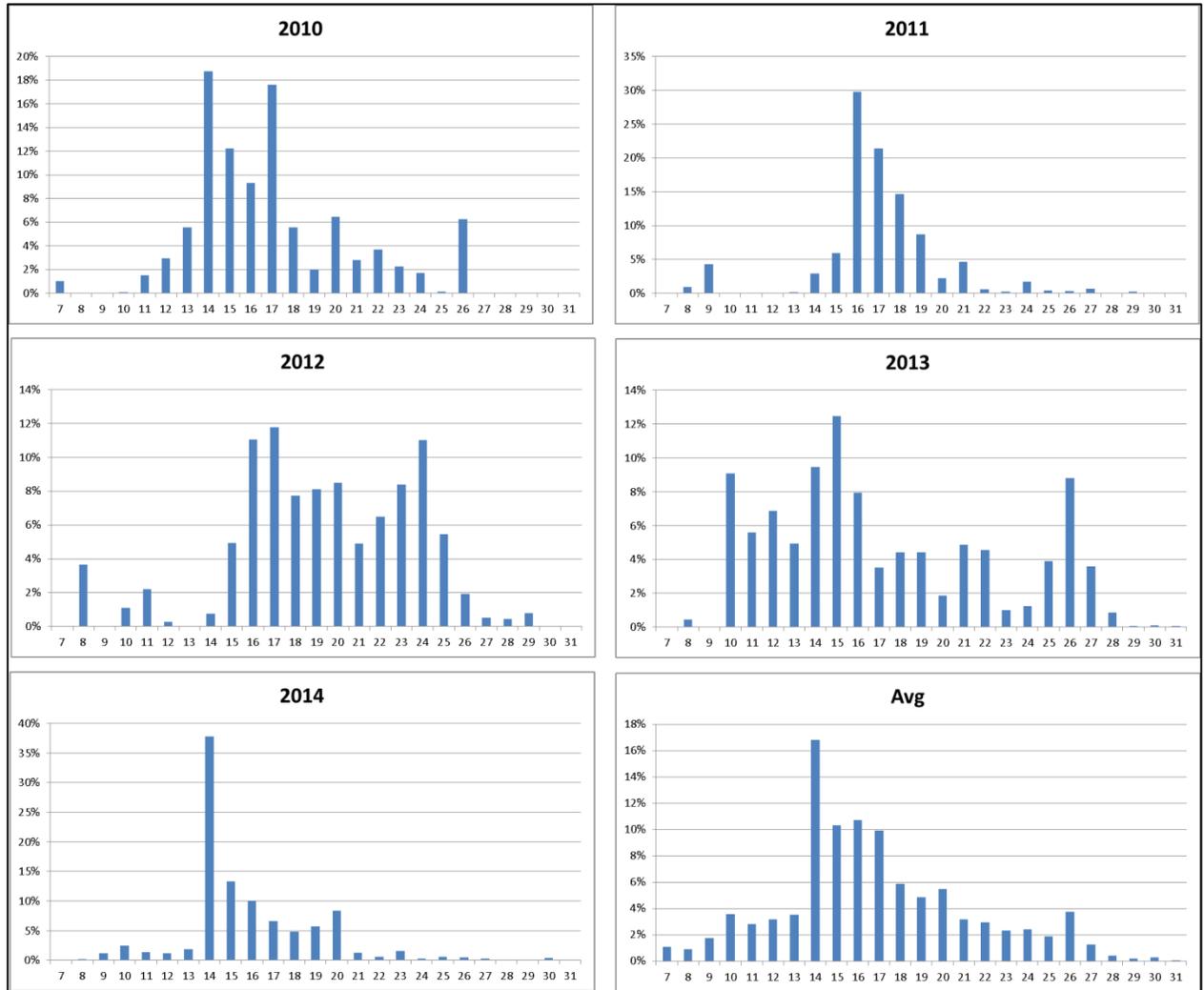


Figure 3. Size composition of the MRIP landings by year.

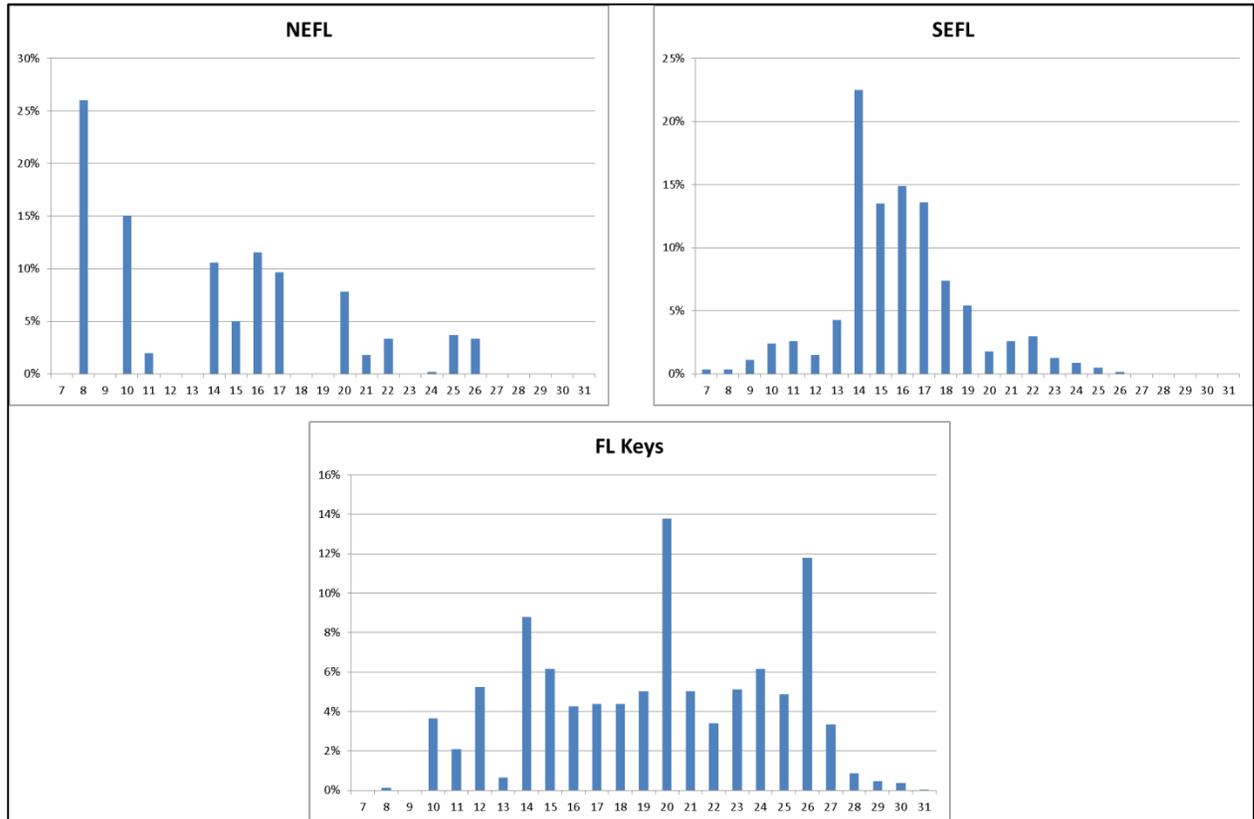


Figure 4. Size composition of the MRIP landings by area (corresponding to the HB areas).

SRHS

The headboat (HB) data was also available at the trip level and were obtained from logbook data. The logbook data were corrected for misreporting using correction factors provided by SRHS staff. These data also included number of fish kept, number of fish discarded, number of anglers on board, and the date of the trip. These data did not include the kind of day, but they did include the type of trip (since headboats can take multiday trips, which allows them to retain a separate bag limit for each day they are out).

Figure 5 shows the HB landings for each of the years included in the analysis, which range from ~9,000 fish to ~17,000 fish. Figure 6 shows the average landings across the years for each month, which were used to predict potential reductions due to changes in management measures and the timing of the Spawning Season.

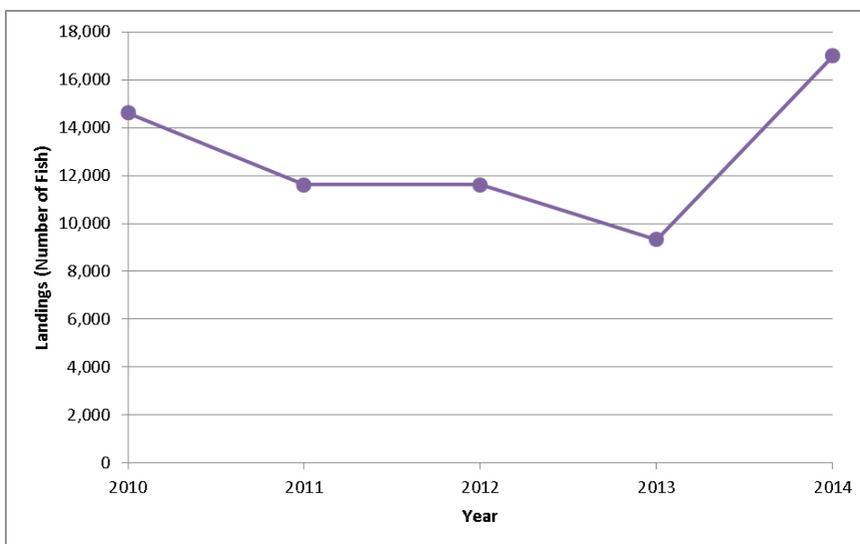


Figure 5. Total yearly HB landings of Mutton Snapper in the SA.

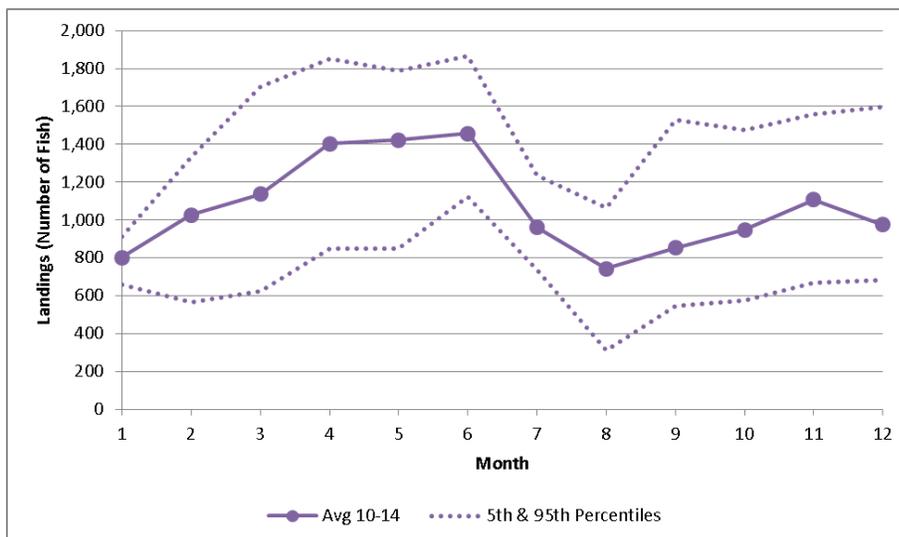


Figure 6. Monthly HB landings of Mutton Snapper in the SA averaged from 2010 to 2014, with 5th and 95th percentile lines.

SIZE LIMIT

Table 1 shows the size limit alternatives being considered for Mutton Snapper. In order to perform this analysis, the landings for each trip were first adjusted based on the proposed size limit of interest. For the status quo of 16 inches, no adjustment was made. All the other proposed size limit alternatives resulted in either a decrease in the trip landings or no adjustment for an individual trip.

The methods for adjusting the MRIP data versus the HB data were different, due to the nature of the data available. The HB data have a “typical” length frequency distribution based on the sampling design, which was calculated for each of 4 areas (NEFL, SEFL,

FL Keys, Dry Tortugas) and by year (Figure 8Figure 9Figure 10). These areas were used because the size composition of the landings differed between these areas (Figure 9). In contrast, MRIP generates length frequencies for each intercepted trip, which can then be expanded to the entire landings. Therefore, the number of fish below a given minimum size limit can be directly determined for each intercepted MRIP trip, rather than applying a general length frequency distribution as is typically done.

Table 1. Mutton Snapper minimum size limit alternatives being considered in Snapper Grouper Amendment 41. TL refers to total length, Alt.1 (No Action) is what is currently in place.

Alternative	Size Limit
Alt. 1 (No Action)	16 inches TL
Alt. 2	17 inches TL
Alt. 3	18 inches TL
Alt. 4	19 inches TL
Alt. 5	20 inches TL

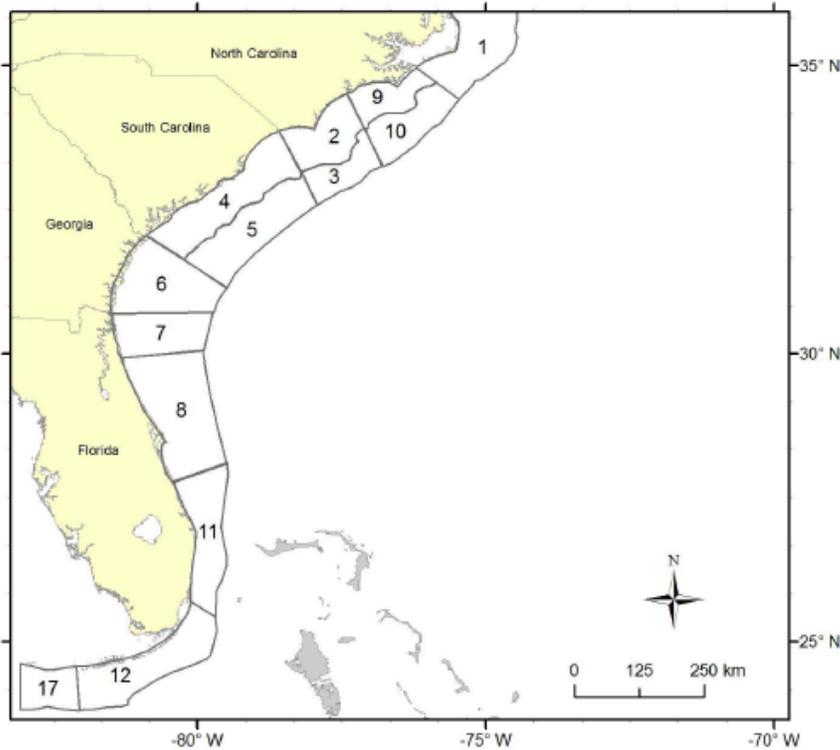


Figure 7. South Atlantic Headboat fishing areas.

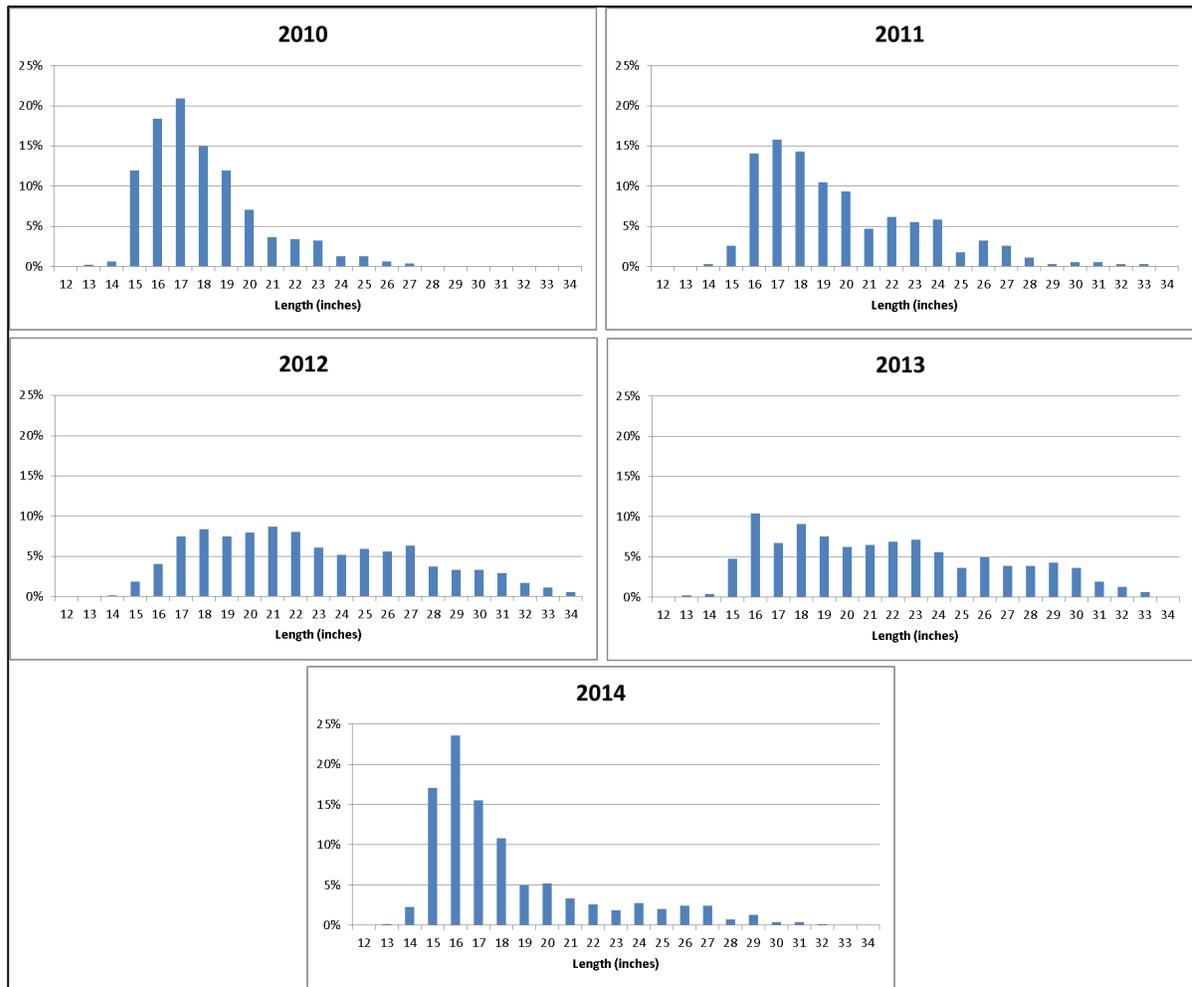


Figure 8. Size composition of the Headboat landings by year.

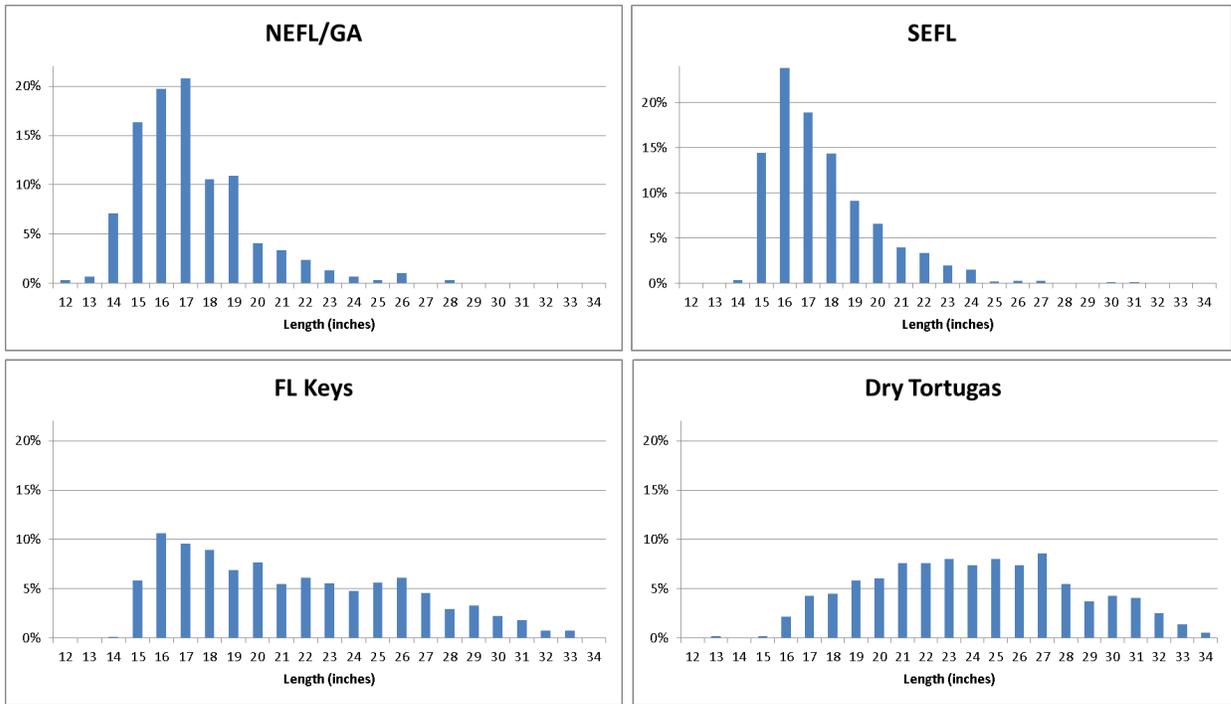


Figure 9. Size composition of the Headboat landings by area fished.

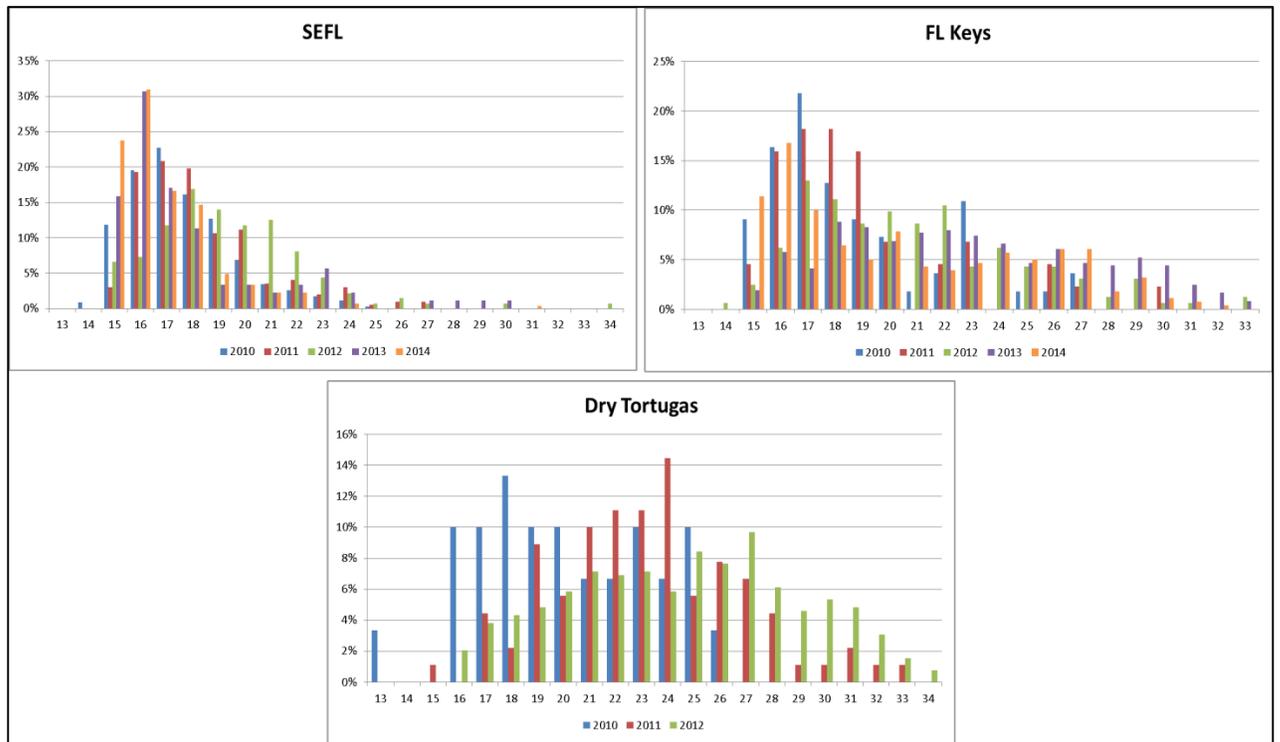


Figure 10. Headboat size composition by year within fishing areas.

SIZE LIMIT RESULTS

Below are the estimated recreational landings of Mutton Snapper under each of the proposed size limit alternatives in Amendment 41 (**Table 2**). The analysis of the size limit alternatives shows that any increase in the size limit will cause at least a 50% reduction in estimated landings in 2017, even if no other management measures are taken. This estimate assumes that fisher behavior will not change after these new management measures take effect. For example, number of trips will not increase and trip length will not increase.

Table 2. Estimated recreational Mutton Snapper landings and percent reduction from status quo landings for alternative size limits proposed in Amendment 41. All size limits are in inches total length.

Alternative	Size Limit (inches)	Est. Landings (numbers of fish)	% Reduction
Status Quo	16	111,966	-
Alt. 2	17	56,284	49.7%
Alt. 3 (Preferred)	18	50,597	54.8%
Alt. 4	19	46,907	58.1%
Alt. 5	20	44,173	60.5%

SPAWNING SEASON AND BAG LIMIT

Once all the trip landings have been adjusted for the proposed size limit alternative to be analyzed, the analysis then considers modifications to the bag limit both within the spawning season and during the rest of the year. The timing of the spawning season must be chosen here before the bag limit analysis can proceed, since there are alternatives that specify different bag limits during the spawning season than the rest of the year.

Next, the bag limit alternatives are chosen for the spawning season and the rest of the year. The landings for each trip are then adjusted based on the bag limit alternative chosen and the month the trip occurred in. If the trip happened within the chosen spawning season, the landings from that trip are compared to the bag limit alternative for the spawning season; otherwise the comparison is made to the bag limit alternative for the rest of the year. If the landings on a trip were below the bag limit alternative, then they were not adjusted. If the landings were above the bag limit alternative, then they were set equal to the bag limit.

Finally, the MRIP adjusted landings per trip needed to be expanded for the recreational effort and corrected for site selection probability in order to get the landings estimates. This was done using a two-step process per trip. First, the landings, which had already been adjusted for the chosen size limit alternative, were multiplied by a correction factor, which corrected for site selection probability. Then, the landings were multiplied by the effort expansion factor. The effort expansion factors are provided by MRIP per trip. The correction factor is calculated by dividing the corrected landings (landings that have already been corrected for site selection probability) by the uncorrected landings (actual

number of fish landed), which are both provided by MRIP. Once the MRIP landings have been expanded for effort and corrected for site selection probability, all landings were summed across months to produce the estimate of landings for each combination of alternatives for each year. The average across 2010-2014 was reported, along with the 5th and 95th percentiles.

CLOSURE DATE PROJECTIONS

Daily landings rates needed to be estimated in order to predict when a closure might occur under each combination of management alternatives and each of the ACL alternatives. The MRIP data include kind of day as one of the data elements, referring to whether the day was a weekday or weekend. Weekends included Saturday, Sunday, and holidays. Kind of day was used to calculate the proportion of the landings within each month, averaged across 2010-2014, attributable to weekdays versus weekends. Month was used for two reasons. The first was because of spawning season alternatives crossing Waves. The second is due to the difference in the proportion of the landings attributable to weekdays versus weekends in different months. For example, in March 56% of the landings happened on weekdays whereas in April only 25% of the landings happened on weekdays and both of those months occur in Wave 2. The HB data did not include kind of day information; therefore it was calculated based on the date of the trip. The daily landings rate is calculated separately for HB and MRIP data, and then combined to get the total landings rate for the kind of day in a given month.

The distribution of weekdays, weekends, and holidays from 2017 was used to project the closure dates. For each month in 2017, the number of weekdays and weekend days was calculated. To get the daily landings for each day within a month, the estimated monthly landings for the chosen combination of management alternatives was multiplied by the proportion of the landings for that month attributable to either weekends or weekdays (depending on which day is being looked at) and then divided by the total number of that kind of day within that month. The cumulative daily landings were compared to each ACL alternative and if it exceeded any of the ACL alternatives, the season was closed for that ACL scenario.

ASSUMPTIONS & UNCERTAINTIES

The analyses conducted here utilized recreational data from two disparate sources and attempted to use these data to predict what might happen to landings in a future year under management conditions which are not currently in place. Therefore, several key assumptions had to be made to allow this analysis to proceed.

1. Fishermen behavior will remain the same as it was during 2010-2014 (the years in the analysis).
 - This is not always the case. Anglers could very well increase their effort to catch more 17 inch fish, but predicting this behavior is very difficult to do in a scientifically rigorous manner. Therefore, this analysis assumes that fisher behavior will remain constant in 2017. One piece of evidence that does suggest this pattern may hold is that the current landings per angler at 16 inches and 10 fish per person bag limit is approximately 0.44 fish per person on trips that caught Mutton Snapper, on average.

- A scenario was run looking at the case where the size limit was only 75% effective, due to changes in fisherman behavior, increases in effort, etc., to investigate the effect of this assumption on the analysis. At 75% effectiveness, there were still no management measure combinations, under any of the three ACL alternatives, which resulted in an early closure.
2. Selectivity is knife-edge for all sizes limits above the current 16 inches.
 - Meaning all fish below the proposed minimum size limits were removed from the landings. However, there is typically some degree of miscalculation or error on the part of the angler and some undersized fish do make it into the landings. Also, B1 fish in the MRIP program (which could be dead discards) are counted as landings. This adds some uncertainty into the analysis, making the analysis a bit conservative.
 3. For headboats, it was assumed that all anglers on a trip were fishing on a communal bag limit rather than individual bag limits, as was done for charter boats.
 - This assumption was considered to be realistic by industry representatives.

Besides the assumptions that had to be made, there were also many sources of uncertainty associated with the data. The MRIP data is survey data, so only a small portion of the total trips is sampled. MRIP samples ~0.22% of the total Mutton Snapper trips and makes up 88.5% of the landings. The Headboat landings data is a census; however the length information is a survey where only 5.6% of the trips are sampled.

Another large source of uncertainty is simply what is known as the year effect. This could refer to the economic climate being more or less conducive to fishing, weather conditions being more or less favorable, temperature patterns being more or less favorable to fish occurrence or migration patterns, or just a different set of trips being intercepted by MRIP. Multiple years were used in the analysis in an attempt to mitigate the year effect. Therefore, the results depict the average conditions (for 2010 to 2014) with confidence intervals around those averages.

In 2013, MRIP implemented a significant change to the Access Point Angler Intercept Survey (APAIS). It is unclear what affect this change has had on estimated landings as compared to years prior to the implementation of the new survey design. In order to investigate a possible bias in landings trends by year and month, the landings were pulled for 2010-2012 (before implementation of the new APAIS survey design) and compared to landings from 2013-2014 (after implementation of the new APAIS survey design). By year, the average across years falls within the 95% confidence intervals (CI) for most years, except 2011 (Figure 11). However, there is no trend separating the 2010-2012 years from the 2013-2014 years. When looked at by month, each of the time block average landings values by month falls within the 95% CI of the other time block except for December (Figure 12). In December, 2013-2014 has much higher landings than those from 2010-2012, on average.

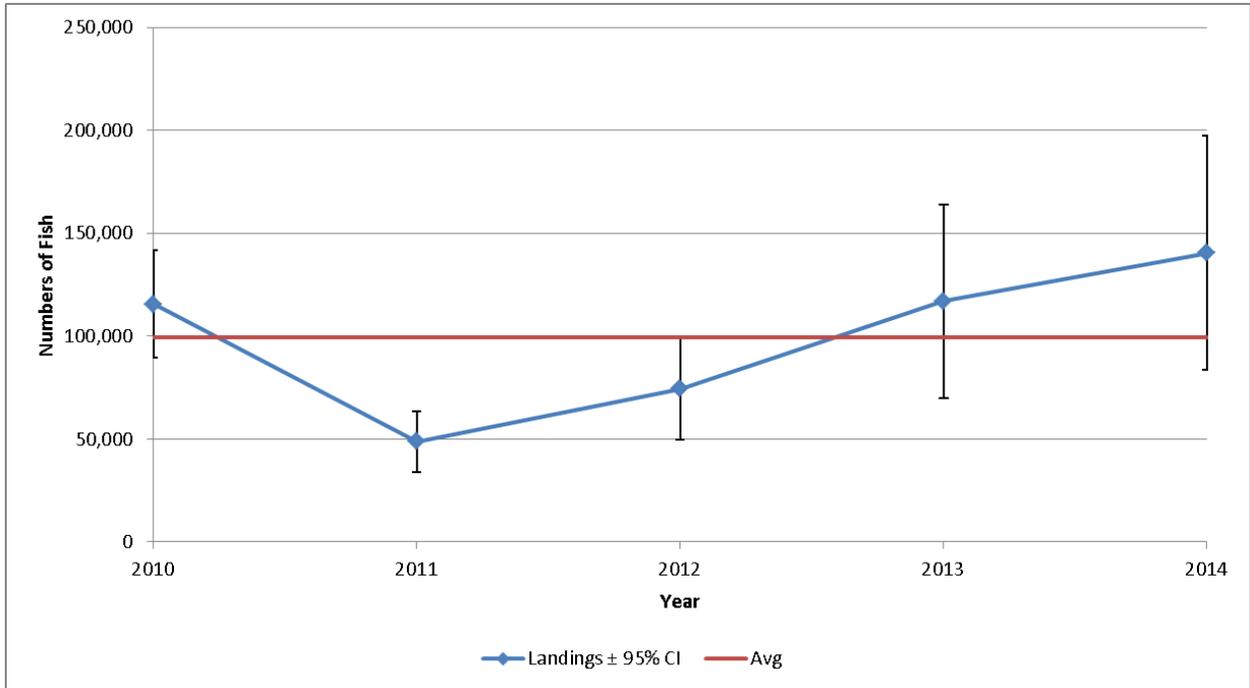


Figure 11. MRIP landings of Mutton Snapper by year with 95% CI and average across 2010-2014.

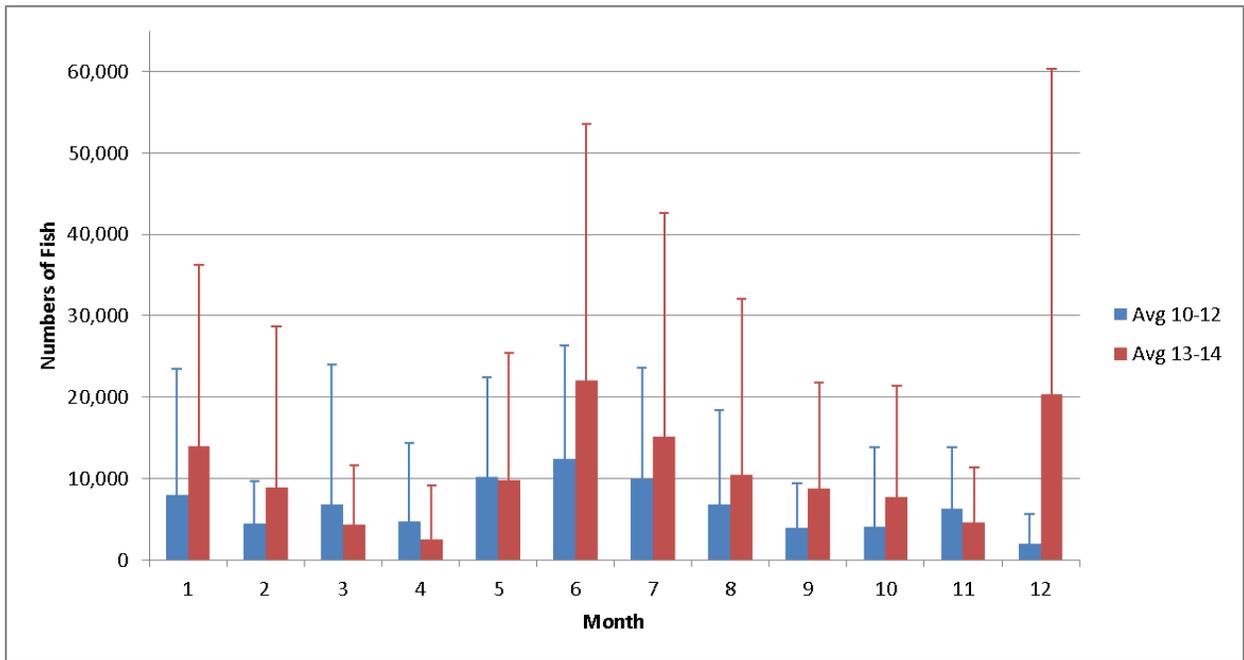


Figure 12. Average monthly MRIP landings of Mutton Snapper for 2010-2012 and 2013-2014 with 95% CI.

RESULTS

According to the analysis, the size limit has the largest impact on the estimated recreational landings of Mutton Snapper in the SA. At the status quo of 16 inches, under the most restrictive year round bag limit of 2 fish per person per day, the average reduction in landings is only estimated to be 3.6%. Even under the most restrictive set of management alternatives (spawning season from April to July, no retention during the spawning season, and 4 fish per person during the rest of the year) at 16 inches the reduction is at 42.3%. In contrast, by going to a 17 inch size limit and keeping the bag limit at 10 fish per person within the Snapper Aggregate year round, the reduction in landings is 49.7%.

Closures are only predicted to occur for ACL alternatives 2b and 2c (95%ABC and 90%ABC, respectively). The earliest predicted closure dates (for the status quo scenario) are Dec 27 for 2b and Dec 9 for 2c. There are no closures predicted for any of the size limit alternatives above the status quo of 16 inches. However, it should be noted that this analysis was only looking at the 2017 fishing year and not beyond that. Changes in the minimum size can have population effects that change the availability of certain size classes over time. For instance, if the size limit was set at 17 inches (holding all other regulations the same as they are currently), the 2017 landings will drop to around 50% of what they would have been at 16 inches, on average. However, over time, more fish will grow into the 17 inch size class and become available to the fishery, causing landings to increase from year to year (all other regulations and conditions being equal). It's possible the landings could eventually get back to the level where they are now, in numbers, just with a larger average weight. Therefore, the relative impacts of the bag limit alternatives may be of interest for future years.

Table 3 shows a comparison of the management alternatives between size limits. Once a size limit is chosen above the 16 inch status quo, the estimated landings drop significantly, as well as the overall variability in the landings due to different bag limit and spawning season alternatives. At 16 inches, the only management measure that has a significant impact on estimated landings (>15%) is when there is no retention for Mutton Snapper during the spawning season. Every other combination of management measures at 16 inches has a less than 4% reduction in landings.

Table 3. Results from the Amendment 41 analysis of recreational Mutton Snapper data, summarized by size limit alternatives. Avg. Est. Landings are the estimated landings averaged across all scenarios at a given size limit. 5th and 95th Percentile are the 5th and 95th percentiles of estimated landings averaged across all scenarios at a given size limit. Std. Dev. is the standard deviation in the estimated landings across all scenarios at a given size limit.

Size Limit	Avg. Est. Landings	5th Percentile	95th Percentile	Std. Dev.
16	103,553	69,787	111,283	14,777
17	51,593	34,502	55,849	7,929
18	49,782	47,905	50,571	931
19	46,242	44,698	46,898	759
20	40,567	27,038	43,779	6,204

Commercial Data Analysis of Management Alternatives

Dr. Michael Larkin, SERO Staff

Minimum Size Limit Analysis

Action 5 in Amendment 41 considers changes to the mutton snapper minimum size limit for the commercial and recreational sectors. Analyses for the recreational sector are presented above. For the commercial sector, mutton snapper length measurements were collected from dockside intercepts of commercial fishers. These data came from the Southeast Fisheries Science Center's Trip Intercept Program (TIP). All lengths were converted to inches total length (TL) using standard conversion factors and equations used in SEDAR 15A (2015). The size limit analysis estimated the percent reduction in weight. Thus the weight of each fish was required. When weight data was available it was used. When weight data was unavailable it was estimated from length using the mutton snapper weight-length equations defined in SEDAR 15A (2015).

Figure 1 provides the South Atlantic mutton snapper length distribution for the commercial sector in 1-inch increments from 2013-2015. In the commercial sector, the majority of the mutton snapper are harvested well above any of the minimum size limits being considered in Amendment 41. In fact, 60% of the lengths are above the largest minimum size (20 inches TL) being considered in the amendment.

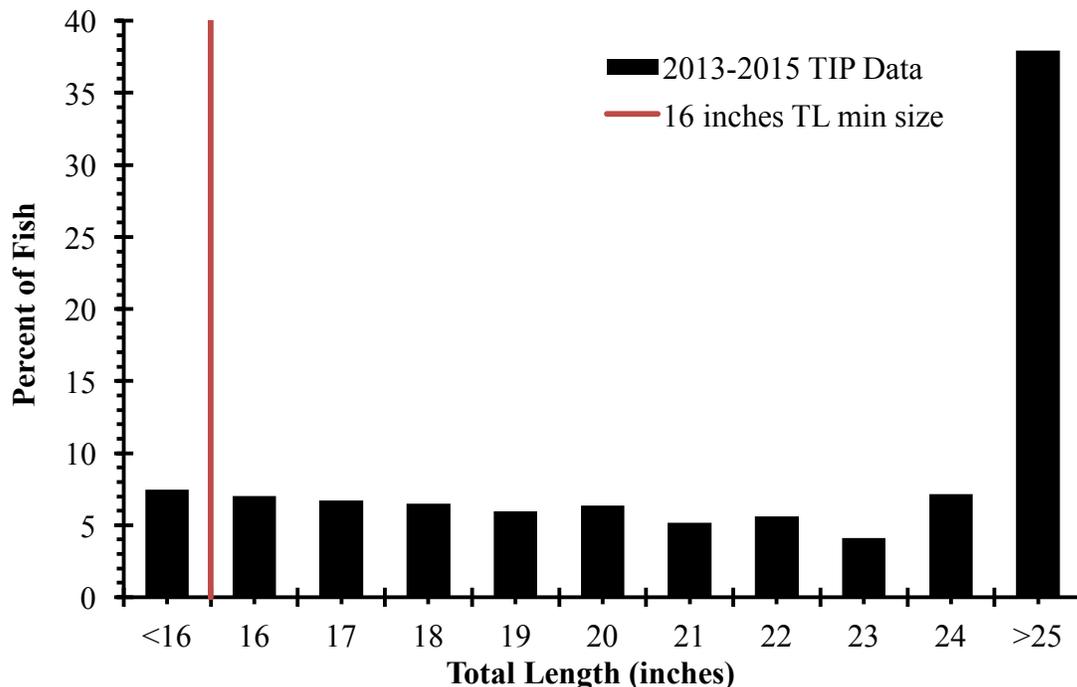


Figure 1. South Atlantic mutton snapper total length distribution generated from commercial dockside intercepts (TIP data) from 2013 to 2015 (n=925 mutton snapper). The red line denotes the current commercial minimum size limit of 16 inches TL.

Reductions in landings in weight were calculated for minimum size limits (MSL) at 1 inch intervals between 16-20 inches TL as follows:

Percent reduction = $((C - (G+R)) - B)/C$, where:

C = catch in pounds

G = weight of fish that are greater than or equal to the MSL

R = release mortality multiplied against the fish that larger than the 16-inch TL MSL and are less than the MSL being considered

B = weight of fish smaller than the 16-inch TL MSL (non-compliance)

Percent reductions associated with MSL were normalized to a 0% reduction at the commercial status quo size limit of 16 inches total length. Due to concerns about low sample sizes, output was pooled for 2013-2015 data. All of the weights used in the analysis are in pounds whole weight. Release mortality was incorporated into the analysis, and was determined to be 15% following SEDAR 15A (2015).

Table 1. Estimated percent reductions in mutton snapper commercial landings for the minimum size limits being considered in Amendment 41. The reduction was generated with TIP data from 2013-2015, and came from a sample of 925 fish.

Minimum Size Limit (inches TL)	Percent Reduction
16	0
17	1.9
18 (Pref)	4.2
19	6.7
20	9.5

The reliability of this analysis is dependent upon the accuracy of the underlying data and input assumptions. This analysis assumes that the commercial harvest of mutton snapper size distribution from 2013-2015 will reflect the size distribution of mutton snapper commercial harvest in the future.

Commercial Trip Limit Analysis

Action 8 of Amendment 41 is proposing modifications to the mutton snapper commercial trip limit during the spawning months and implementation of a trip limit during the remainder of the year (non-spawning months). The spawning and non-spawning months for mutton snapper are considered in Action 6. The rationale behind these modifications is concern regarding mutton snapper harvest during the spawning season. Currently, commercial harvest is restricted during May and June to 10 fish per person per day or 10 fish per person per trip, whichever is more restrictive.

Commercial logbook data (accessed September 3, 2015) from the Southeast Fisheries Science Center (SEFSC) was explored to determine the harvest of mutton snapper per trip. The most recent years of complete data (2012-2014) had 4,551 trips that harvested

mutton snapper in the South Atlantic. South Atlantic commercial trips that harvested mutton snapper were explored during May and June and outside those months (**Figure 2**).

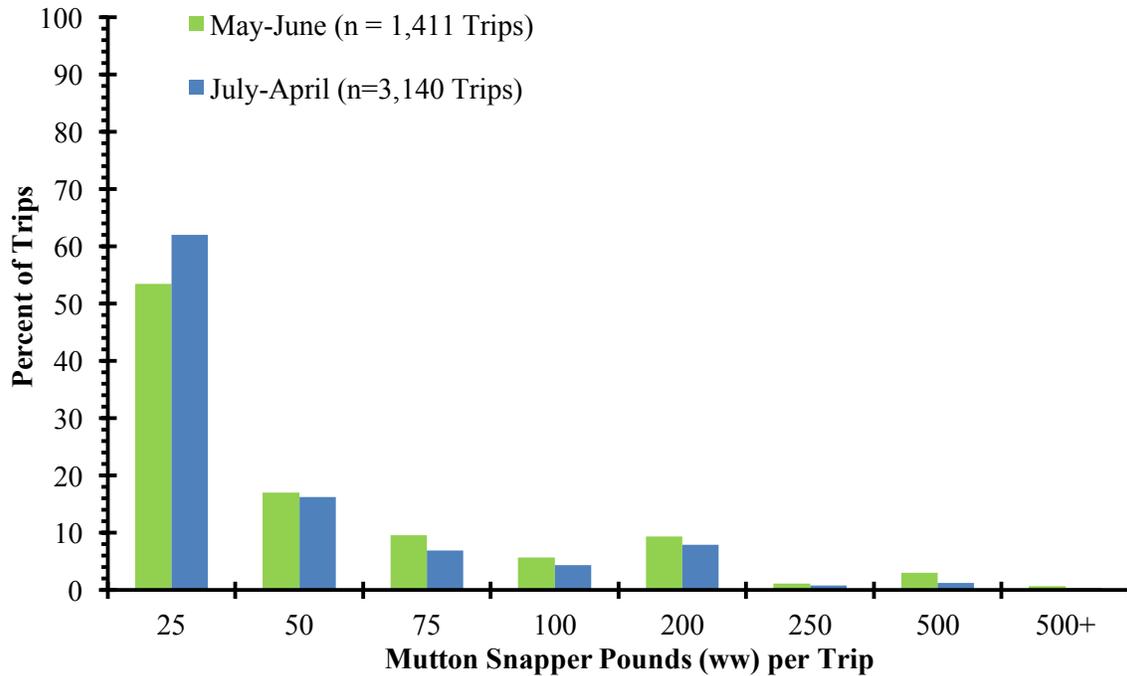


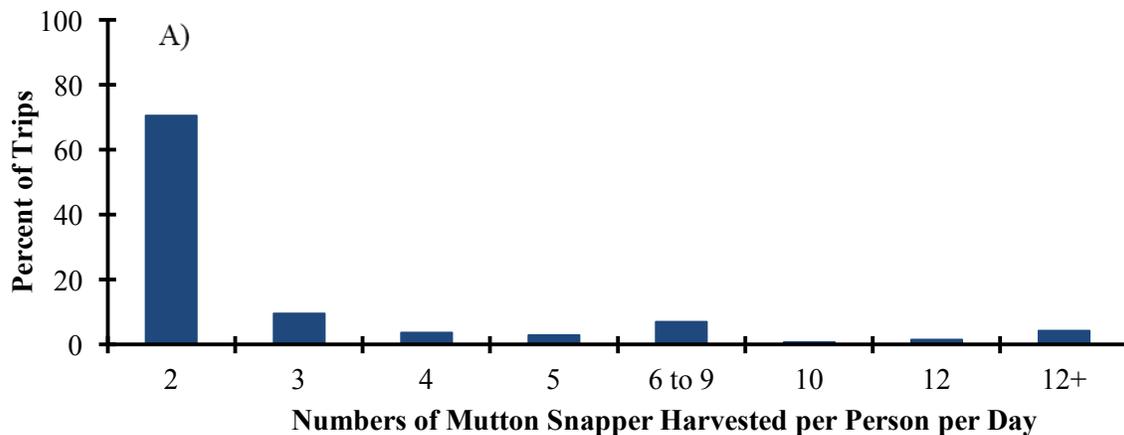
Figure 2. Distribution of the mutton snapper harvested per trip (lbs ww) in the South Atlantic region from the commercial logbook dataset from 2012 to 2014. Restrictions on commercial harvest are currently in place during May and June only.

Preferred Alternative 2 of Action 8 considers implementing a trip limit during the ‘regular season.’ The months that constitute the ‘regular season’ are proposed in Action 6 (the preferred alternative would establish April-June as the “spawning months” and March-July as the “regular season”). **Preferred Alternative 2** proposes trip limits of 300, 400, and 500 pounds whole weight (lbs ww) during the “regular season”. The SEFSC logbook data were analyzed by imposing the proposed trip limits under **Preferred Alternative 2** only during the ‘regular season.’ For example, a trip in the ‘regular season’ that harvested 500 lb ww of mutton snapper was reduced to just 500 lbs to examine the proposed 500 lbs ww trip limit under **Preferred Sub-alternative 2c**, while landings during the proposed “spawning months” under Action 5 were not reduced. The reduced landings from the imposed trip limit were compared to the total annual unmodified landings to estimate the percent reduction in landings (**Table 2**).

Table 2. Percent decreases in total landings for various commercial trip limits proposed under **Preferred Alternative 2**. Data from the commercial logbook, 2012 to 2014.

Regular Season	Trip Limit		
	300 lbs ww	400 lbs ww	500 lbs ww
July - April	-6.0%	-4.6%	-3.7%
July - March	-5.9%	-4.5%	-3.7%
August - March	-4.1%	-3.0%	-2.3%
August - April	-4.2%	-3.0%	-2.3%

The commercial logbook data provides landings in pounds; however, the current commercial harvest restriction during May and June is specified in numbers of fish. **Preferred Alternative 3** proposes commercial possession limits in numbers of fish. To conduct the analysis, landings in pounds were converted to numbers of fish by dividing the harvest by the average weight of mutton snapper harvested commercially. Average weight was determined to be 7.68 lbs ww in the commercial sector in the most recent stock assessment (SEDAR 15A update 2015). **Preferred Alternative 3** proposes commercial trip limits in numbers of fish in two ways: per person per day, and per vessel per day. **Figure 2** provides the percentage of trips distribution of the total numbers of mutton snapper harvested both per person per day (**Figure 3A**) and per vessel per day (**Figure 3B**) during May-June from 2012 through 2014.



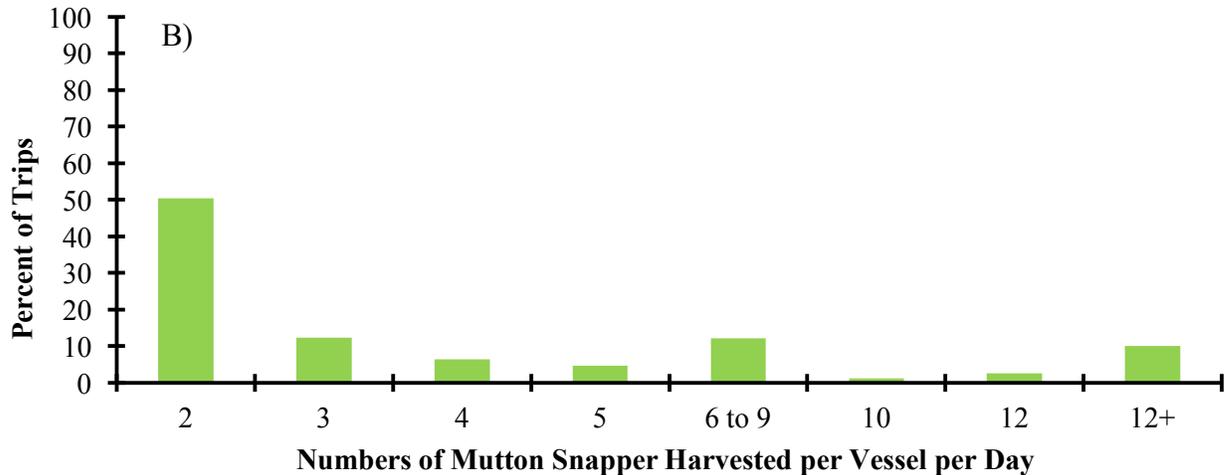


Figure 3. Distribution of the total number of mutton snapper harvested per person per day (A) and numbers of mutton snapper harvested per vessel per day (B) in the South Atlantic region during May and June. Data from the commercial logbook, 2012 to 2014 (n = 1,411 trips).

As mentioned previously, **Alternative 1 (No Action)** specifies a commercial trip limit of 10 fish per person per day or 10 fish per person per trip, whichever is more restrictive. There is the potential, however, for vessels to intentionally carry additional people on commercial trips during May and June to maximize harvest of mutton snapper. **Figure 3A** which shows the distribution of total number of mutton snapper harvested per person per day and indicates that 5.8% of the trips that took place during May and June from 2012 through 2014 exceed the current 10 fish per person per day limit.

Sub-alternatives under **Preferred Alternative 3** propose per person possession limits, per vessel limits, and no retention during the spawning months (defined under Action 6 as April-June). The per-person trip limits were analyzed by dividing the total catch by the total number of people, including the captain, on a commercial trip. The per-vessel trip limit analysis focused on trip level data per day. This was analyzed by dividing the catch per trip by the number of days reported in the commercial logbook. An examination of the commercial logbook data from 2012 through 2014 revealed that 70% (n = 989 trips) of the mutton snapper commercial fishing trips during May and June are one-day trips. Each of the proposed trip limits under **Preferred Alternative 3** were analyzed for each proposed “spawning months” sub-alternative under Action 6. Percent reductions in commercial landings were calculated for the proposed trip limits of 0, 2, 3 and 5 mutton snapper per person per day by reducing trips that exceeded the proposed trip limit to match the trip limit being considered. For example, to analyze the reduced trip limit of 3 fish/person/day a trip that reported harvest of 9 mutton snapper/person/day was reduced to 3 mutton snapper/person/day. Landings outside the proposed “spawning months” were not modified. The reduced total annual landings were then compared against the total annual landings to determine the percent reduction in landings from the reduced trip limit.

Implementing a trip limit of 10 to 12 mutton snapper per vessel inside the spawning season would decrease landings because the current 10 fish trip limit is per person.

Therefore, under the current trip limit (**Alternative 1**) a one-day trip with two people can harvest 20 mutton snapper; however, under the **Sub-alternatives 3c** and **3d** a one day trip can only harvest 10 or 12 mutton snapper, respectively, regardless of the number of people are on the boat. Percent reductions in commercial landings were calculated for the proposed vessel limits of 10 and 12 mutton snapper per vessel per day by reducing trips that exceeded the proposed trip limit to match the trip limit being considered. For example, to analyze the trip limit of 10 mutton snapper/vessel/day a trip that reported harvest of 15 mutton snapper/vessel/ day was reduced to 10 mutton snapper/person/day. This vessel limit analysis only modified trips inside the spawning season. Trips outside the spawning season were not modified. Then the decreased total annual landings were compared against the total annual landings to determine the percent decrease in total landings from the vessel trip limit. **Table 3** provided the percent decrease in landings for the various commercial trip limits proposed in **Preferred Alternative 3**.

Table 3. Percent decrease in landings for various commercial trip limits proposed in Alternative 3 of Action 7 in Amendment 41. The estimates came from mutton snapper commercial logbook data from 2012 to 2014, and the reductions were calculated for changes to the trip limit inside the spawning season.

Spawning Season	Possession Limit					
	No Retention	2 fish/ person/day	3 fish/ person/day	5 fish/ person/day	10 fish/ vessel/day	12 fish/ vessel/day
May-June	-35.8%	-20.0%	-16.3%	-8.6%	-4.1%	-2.8%
April-June	-41.7%	-23.5%	-19.3%	-13.6%	-5.0%	-3.5%
April-July	-52.6%	-29.6%	-24.2%	-17.1%	-6.9%	-5.1%
May-July	-46.6%	-29.6%	-21.3%	-14.9%	-6.0%	-4.5%

This analysis attempted to predict realistic changes to the landings from the various trip limit options presented in the amendment. Uncertainty exists in these projections, as economic conditions, weather events, changes in catch-per-unit effort, fisher response to management regulations, and a variety of other factors may cause departures from this assumption. The bounds of this uncertainty are not captured by the model as currently configured; as such, the results of this analysis should be used with caution. In addition to the aforementioned sources of uncertainty, the modeled reductions associated with management measures assume that past performance in the fishery is a good predictor of future dynamics. An attempt was made to constrain the range of data considered to recent years to reduce the unreliability of this assumption.