Regulatory Amendment 12

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

Golden Tilefish ACL/OY Adjustment, Specification of Commercial ACT, and Revision of Recreational AMs

Environmental Assessment Initial Regulatory Flexibility Act Analysis Regulatory Impact Review

Fishery Impact Statement

February 27, 2012

Definitions, Abbreviations, and Acronyms

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

Regulatory Amendment 12

(Golden Tilefish ACL, OY, ACT, & AMs) to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region with Environmental Assessment, Initial Regulatory Flexibility Act Analysis, Regulatory Impact Review, and Fishery Impact Statement

Proposed actions:	For golden tilefish, modify the optimum yield (OY), annual catch limit (ACL), annual catch target (ACT), and accountability measures (AMs).
Lead agency:	FMP Amendment – South Atlantic Fishery Management Council EA - NOAA Fisheries Service
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Public Hearing held:	March 8, 2012

(Note: Snapper Grouper Amendment 18B includes actions that would adjust the Annual Catch Limit (ACL)/Optimum Yield (OY) and Accountability Measures (AMs) for golden tilefish and includes the same alternatives presented in this Regulatory Amendment with the exception of new Alternative 5 in Action 1 and new Action 2. Public hearings occurred from January 24 through February 2, 2012.)

Abstract

The South Atlantic Fishery Management Council (South Atlantic Council) intends to implement the Annual Catch Limit (ACL) increases based on the new golden tilefish stock assessment. The assessment, conducted in 2011 with data through 2010, concluded golden tilefish are not overfished and overfishing is not occurring.

Actions in Snapper Grouper Regulatory Amendment 12 would:

- Modify the Optimum Yield (OY) and Annual Catch Limit (ACL) for golden tilefish in the South Atlantic
- Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector in the South Atlantic
- Revise recreational Accountability Measures (AMs) for golden tilefish in the South Atlantic

In addition, the Scientific and Statistical Committee (SSC) has specified the Overfishing Limit (OFL) and calculated the Acceptable Biological Catch (ABC) based on the Council/SSC ABC Control Rule.

This Draft Environmental Assessment (EA) has been prepared to analyze the effects of implementing regulations to achieve the actions listed above.

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Public Hearing SUMMARY

of

Regulatory Amendment 12
to the Fishery Management Plan for the Snapper Grouper Fishery
of the South Atlantic Region

Golden Tilefish, *Lopholatilus chamaeleonticeps*

Public Hearing: March 8, 2012

(Note: Snapper Grouper Amendment 18B includes actions that would adjust the Annual Catch Limit (ACL)/Optimum Yield (OY) and Accountability Measures (AMs) for golden tilefish and includes the same alternatives presented in this Regulatory Amendment with the exception of new Alternative 5 in Action 1 and new Action 2. Public hearings occurred from January 24 through February 2, 2012.)

Why is the South Atlantic Council taking Action?

The South Atlantic Fishery Management Council (South Atlantic Council) intends to implement the Annual Catch Limit (ACL) increases based on the new golden tilefish stock assessment. The assessment, conducted in 2011 with data through 2010, concluded golden tilefish are not overfished and overfishing is not occurring.

Purpose for Action

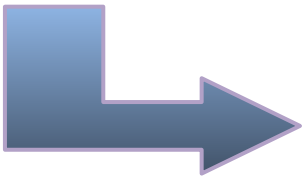
The purpose of this proposed action is to adjust the Annual Catch Limit (ACL) and Optimum Yield (OY), specify a commercial Annual Catch Target (ACT), and revise recreational Accountability Measures (AMs) for the golden tilefish component of the snapper grouper fishery.

Need for Action

These adjustments address the recent stock assessment results based on data through 2010.

What Are the Proposed Actions?

There are 3 actions being proposed in Regulatory Amendment 12. Each *action* has a range of *alternatives*, including a "no action alternative" and a "preferred alternative".



Proposed Actions in Regulatory Amendment 12

1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Golden Tilefish
2. Establish an Annual Catch Target (ACT) for the Golden Tilefish Commercial Sector
3. Revise Recreational Accountability Measures (AMs) for Golden Tilefish

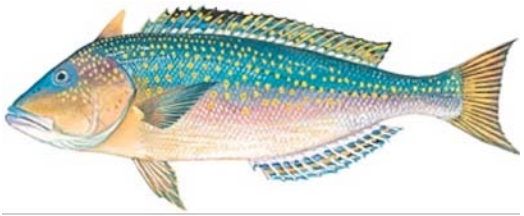
Indicates the Council's preferred alternative(s) from Snapper Grouper Amendment 18B

What Is the Status of the Golden Tilefish Stock?

Golden tilefish were assessed through the Southeast Data, Assessment and Review (SEDAR) process in 2011 using data through 2010.

SEDAR is a cooperative Fishery Management Council process initiated to improve the quality and reliability of fishery stock assessments in the South Atlantic, Gulf of Mexico, and US Caribbean. The Caribbean, Gulf of Mexico, and South Atlantic Fishery Management Councils manage SEDAR in coordination with NOAA Fisheries 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.

Golden Tilefish Life History
An Overview



On the Atlantic coast, they occur from Nova Scotia to South Florida.

Most often found around 600 feet, over mud or sand bottom.

May live up to 50 years

Spawn from March to July with peak in April

Not undergoing overfishing, not overfished.

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

The stock assessment for golden tilefish (SEDAR 25 2011) indicated that the South Atlantic population is **not overfished nor undergoing overfishing**. The current level of spawning stock biomass (SSB_{2010}) is estimated to be well above the Minimum Stock Size Threshold (MSST) -- $SSB_{2010}/MSST = 2.43$. The current level of fishing is slightly higher than one-third of F_{MSY} ($F_{2008\text{-}2010}/F_{MSY} = 0.36$).

What Are the Alternatives?

Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Golden Tilefish

Alternative 1 (No Action). ACL and OY = yield at 75%F_{MSY}.

Alternative 2. ACL = OY = Acceptable Biological Catch (ABC).

Alternative 3. ACL = OY = 90% of the ABC.

Alternative 4. ACL = OY = 80% of the ABC.

Alternative 5. ACL = OY = yield at 75%F_{MSY} when stock is at equilibrium.

Proposed Actions in Regulatory Amendment 12

1. **Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Golden Tilefish**
2. Establish an Annual Catch Target (ACT) for the Golden Tilefish Commercial Sector
3. Revise Recreational Accountability Measures (AMs) for Golden Tilefish

Summary of Effects of Action 1:

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action). ACL & OY = yield @ 75% F_{MSY}.	Is not consistent with Magnuson-Stevens Act and is not a viable alternative.	Is not consistent with Magnuson-Stevens Act and is not a viable alternative.
Alternative 2. ACL = OY = ABC.	Least biological benefits since no buffer between ACL & ABC.	Highest short-term benefits but could be lower in long-term given no buffer between ACL & ABC.
Alternative 3. ACL = OY = 90% of the ABC.	Biological benefits intermediate between **Alternatives 2** and **4** since 10% buffer between ACL & ABC.	Short-term benefits intermediate between **Alternatives 2** and **4** but higher in long-term given a 10% buffer between ACL & ABC.
Alternative 4. ACL = OY = 80% of the ABC.	Highest biological benefits since 20% buffer between ACL & ABC.	Lowest short-term benefits but higher in long-term given a 20% buffer between ACL & ABC.
Alternative 5. ACL = OY = yield @ 75% F_{MSY} when stock is at equilibrium.	High, sustainable biological benefits since the ACL is set at the yield at 75%F_{MSY} when stock is at equilibrium and there is a buffer between ACL & ABC.	Sustainable short-term and long-term benefits since the ACL is set at 75%F_{MSY} when stock is at equilibrium and there is a buffer between ACL & ABC.

Action 2. Establish an Annual Catch Target (ACT) for the Golden Tilefish Commercial Sector

Alternative 1 (No Action). No commercial Annual Catch Target (ACT) currently exists for golden tilefish.

Alternative 2. Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector = 90% of the commercial sector ACL.

Alternative 3. Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector = 75% of the commercial sector ACL.

Alternative 4. Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector = 50% of the commercial sector ACL.

Proposed Actions in Regulatory Amendment 12

1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Golden Tilefish
2. **Establish an Annual Catch Target (ACT) for the Golden Tilefish Commercial Sector**
3. Revise Recreational Accountability Measures (AMs) for Golden Tilefish

Council's Intent

The Council's intent is that if the commercial ACT is met, or projected to be met, the commercial fishery would be closed; harvest and possession would be limited to the bag limit and no sale would be allowed. There are no Accountability Measures (AMs) in place that would require landings over the ACL to be deducted from the following year or that would provide for any underage of the ACL to be added the following year.

Summary of Effects of Action 2:

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action). No commercial ACT currently exists.	Negative biological effects possible if overfishing results from continued overages.	Highest short-term benefits but possible negative long-term benefits if overfishing results from continued overages.
Alternative 2. Commercial ACT = 90% commercial ACL.	Negative biological effects lower than **Alternative 1 (No Action)**.	Short-term benefits lower than **Alternative 1 (No Action)** but higher than **Alternatives 3** and **4**. Positive long-term benefits since risk of lower landings due to quota overages is reduced.
Alternative 3. Commercial ACT = 75% commercial ACL.	Negative biological effects intermediate between **Alternatives 2** and **4**.	Lower short-term benefits than **Alternative 4** but higher positive long-term benefits since risk of lower landings due to quota overages is reduced.
Alternative 4. Commercial ACT = 50% commercial ACL.	Least negative biological effects since 50% buffer between ACL & ACT and greatest assurance that ACL is not exceeded.	Least short-term benefits but most positive long-term benefits.

Action 3. Revise Recreational Accountability Measures (AMs) for Golden Tilefish

Alternative 1 (No Action). Do not revise current recreational AMs for golden tilefish.

If the recreational ACL is exceeded, the Regional Administrator (RA) shall publish a notice to reduce the length of the following recreational fishing season by the amount necessary to ensure landings do not exceed the recreational sector ACL for the following fishing season. Compare the recreational ACL with projected recreational landings over a range of years. For 2010, use only 2010 landings. For 2011, use the average landings of 2010 and 2011. For 2012 and beyond, use the most recent three-year running average.

Alternative 2. Specify the recreational in-season AM trigger.

Sub-alternative 2a. Do not specify an AM trigger.

Sub-alternative 2b (Preferred). If the annual landings exceed the ACL in a given year.

Alternative 3. Specify the recreational in-season AM.

Sub-alternative 3a. Do not specify an in-season AM.

Sub-alternative 3b (Preferred). The Regional Administrator (RA) shall publish a notice to close the recreational sector when the ACL is projected to be met.

Alternative 4. Specify the recreational post-season AM.

Sub-alternative 4a (Preferred). Monitor following year and shorten season as necessary. If the ACL is exceeded, the following year's recreational landings would be monitored in-season for persistence in increased landings. The Regional Administrator (RA) will publish a notice to reduce the length of the recreational fishing season as necessary.

Sub-alternative 4b. Payback. If the recreational ACL is exceeded, and golden tilefish are overfished, the Regional Administrator (RA) shall publish a notice to reduce the recreational ACL in the following season by the amount of the overage.

Proposed Actions in Regulatory Amendment 12

1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Golden Tilefish
2. Establish an Annual Catch Target (ACT) for the Golden Tilefish Commercial Sector
3. **Revise Recreational Accountability Measures (AMs) for Golden Tilefish**

Summary of Effects of Action 3:

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action). Reduce length of following season and use 3-year running average.	Possible biological benefits due to reduction of fishing season if ACL exceeded with 3-year average.	Possible negative short-term and long-term impacts due to reduction of fishing season if ACL exceeded with 3-year average.
Sub-alternative 2a. No AM trigger.	Least amount of biological benefits.	High short-term indirect benefits but diminishing long-term benefits due to potential ACL overages. Negative impacts greater than **Sub-alternative 2b (Preferred)**.
Sub-alternative 2b (Preferred). If landings exceed ACL in given year.	Does not address anomalous spikes in landings; only one year's data used to determine trigger.	Negative short-term indirect economic effects but less than **Alternative 1 (No Action)**. Increased socioeconomic benefits over time due to avoidance of unnecessary AMs being triggered.
Sub-alternative 3a. No in-season AM.	May have negative effects since there would be less of a chance that ACL overages are prevented.	Short-term benefits higher than under **Sub-alternative 3b (Preferred)** but lower long-term benefits due to potential ACL overages
Sub-alternative 3b (Preferred). Regional Administrator closes recreational sector when ACL projected to be met.	High biological benefits due to greater assurance that the ACL will not be exceeded.	Lower short-term benefits than under **Sub-alternative 3a** but higher long-term by preventing ACL overages.
Sub-alternative 4a (Preferred). Monitor following year and shorten season as necessary.	Moderate biological benefits since the following fishing season and associated mortality is addressed.	Ensures that AMs are triggered when absolutely necessary; beneficial in the short term but lower benefits over long term due to potential ACL overages.
Sub-alternative 4b. Payback. If recreational ACL exceeded, and golden tilefish are overfished, reduce the recreational ACL in the following season.	Highest biological benefit by reducing the following year ACL by the amount of the overage; critical if stock is overfished.	Negative short-term impacts higher than **Sub-alternative 4a (Preferred)** but higher long-term benefits by ensuring resource sustainability

Chapter 1.
Introduction

1.1 What Action Is Proposed?

Regulatory Amendment 12 to the Snapper Grouper Fishery Management Plan of the South Atlantic Region (Regulatory Amendment 12) contains three actions:

(1) Modify the Optimum Yield (OY) and Annual Catch Limit (ACL) for golden tilefish in the South Atlantic,

(2) Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector in the South Atlantic, and

(3) Revise the recreational Accountability Measures (AMs) for golden tilefish in the South Atlantic.

1.2 Who is proposing the Action?

The South Atlantic Fishery Management Council (South Atlantic Council) is proposing the actions. The South Atlantic Council develops the actions and regulations for review and implementation by the National Marine Fisheries Service (NOAA Fisheries Service) who ultimately approves, disapproves, or partially approves the actions on behalf of the Secretary of Commerce. NOAA Fisheries Service is an agency in the National Oceanic and Atmospheric Administration.

South Atlantic Fishery Management Council

- Responsible for conservation and management of fish stocks
- Consists of 13 voting members who are appointed by the Secretary of Commerce and 4 non-voting members
- Management area is from 3 to 200 miles off the coasts of North Carolina, South Carolina, Georgia, and east Florida through Key West
- Develops management plans and regulations for review and implementation by NOAA Fisheries Service

1.3 Where is the Project Located?

Management of the federal snapper grouper fishery (including golden tilefish), located off the South Atlantic in the 3-200 nautical mile U.S. Exclusive Economic Zone (EEZ), is conducted under the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (SAFMC 1983) (**Figure 1-1**).

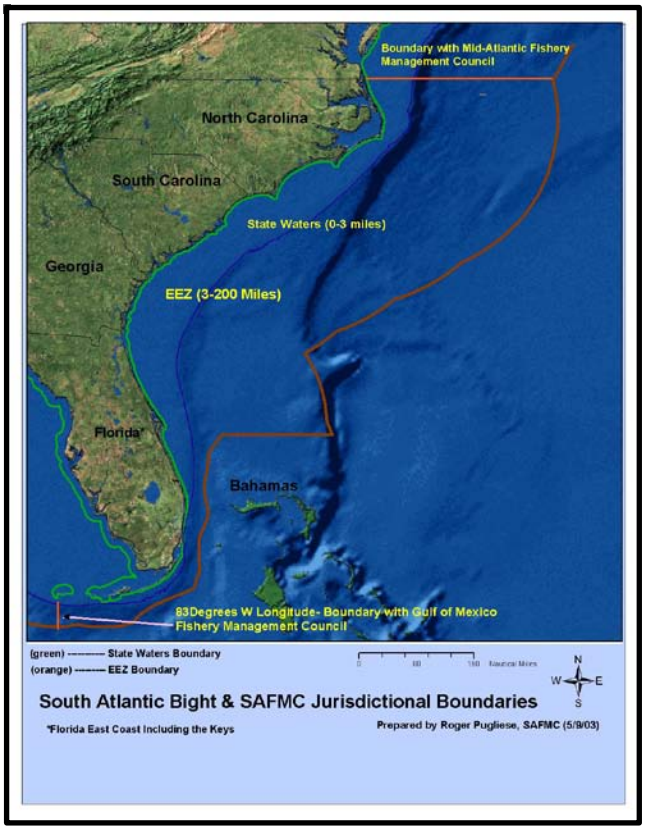


Figure 1-1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

1.4 Why is the South Atlantic Council Considering Action?

The purpose of this proposed action is to adjust the Annual Catch Limit (ACL) and Optimum Yield (OY) for the golden tilefish component of the snapper grouper fishery based on results of the new stock assessment conducted in 2011 with data through 2010 (SEDAR 25 2011).

Purpose for Action

The purpose of this proposed action is to adjust the Annual Catch Limit (ACL) and Optimum Yield (OY), specify a commercial Annual Catch Target (ACT), and revise recreational Accountability Measures (AMs) for the golden tilefish component of the snapper grouper fishery.

Need for Action

These adjustments address the recent stock assessment results based on data through 2010.

1.5 What Are Annual Catch Limits (ACLs) and Accountability Measures (AMs) and Why are they required?

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires NOAA Fisheries Service and the Regional Fishery Management Councils to prevent overfishing, to achieve (on a continuing basis) the Optimum Yield (OY) from federally managed fish stocks, and to rebuild stocks that have been determined to be overfished. These mandates ensure management of fishery resources for the greatest overall benefit to the nation, particularly with respect to providing food production and recreational opportunities, and protecting marine ecosystems.

Reauthorization of the Magnuson-Stevens Act in 2007 required implementation of new tools that, when implemented, would end and prevent overfishing in order to achieve the OY from a fishery. The tools are ACLs and AMs.

An ACL is the level of annual catch (both landings and discard mortality) of a stock that, if met or exceeded, triggers some corrective action. The AMs are management controls to prevent exceeding the ACLs and to correct for overages of ACLs if they occur. An AM might be an in-season closure if catch approaches the ACL or it may require reducing the ACL by an overage that occurred the previous fishing year.

1.6 How Does the South Atlantic Council Determine the ACLs?

Annual Catch Limits (ACLs) are lower than the Overfishing Limit (OFL) and the Acceptable Biological Catch (ABC) **(Figure 1-2)**. The South Atlantic Council's Scientific and Statistical Committee (SSC) determines the OFL. The South Atlantic Council and SSC developed the ABC control rule. The South Atlantic Council approved the control rule and added it to the Comprehensive ACL Amendment (SAFMC 2011c). NOAA Fisheries approved the Comprehensive ACL Amendment on January 18, 2012. The ABC is calculated using the South Atlantic Council/SSC ABC Control Rule.

The OFL is an estimate of the catch level above which overfishing is occurring and comes from a stock assessment. The ABC is defined as the level of a stock's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty, and should be specified based on the South Atlantic Council/SSC's ABC control rule.

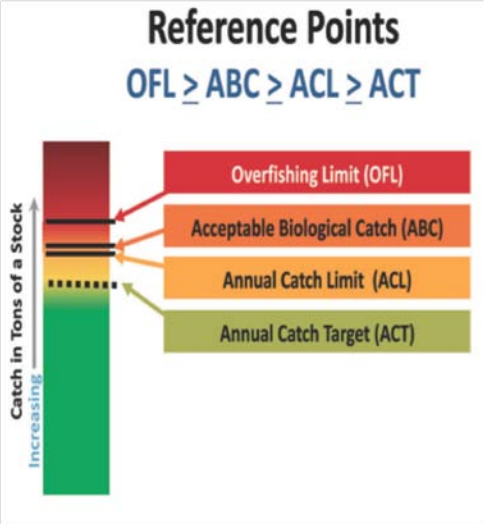


Figure 1-2. The relationship of the ACL, ABC, and OFL to each other.

1.7 How does this relate to golden tilefish?

Results of the assessment of the golden tilefish stock in the South Atlantic (SEDAR 25 2011), completed in 2011 with data through 2010, indicated the stock is **not overfished** and is **not undergoing overfishing**. The Scientific and Statistical Committee (SSC), using the Council/SSC Acceptable Biological Catch (ABC) Control Rule, has recommended establishing the ABC at a level that would result in a 35% probability of overfishing. **The SSC also specified the Overfishing Limit (OFL) from SEDAR 25 as the yield at F_{MSY}.** Currently there is no ABC or OFL specified for golden tilefish.

Amendment 17B (SAFMC 2010b) specified the ACL for golden tilefish as the yield from fishing at 75% of F_{MSY}. Based on the most recent stock assessment (SEDAR 25 2011), the yield at 75% of F_{MSY} is greater than the ABC recommended by the South Atlantic Council's SSC (**Table 4-2**) using the South Atlantic Council's ABC Control Rule specified in the Comprehensive ACL Amendment (SAFMC 2011c). The values in **Table 4-2** are projections at the level the SSC specified based on the South Atlantic Council/SSC ABC Control Rule (Probability of Overfishing (P*) = 35%).

The SSC specified the OFL for golden tilefish as the yield at F_{MSY}. Values for OFL for 2012-2015 based on the most recent stock assessment (SEDAR 25 2011) are shown in **Table 4-2**.

The South Atlantic Council sets the Annual Catch Limit (ACL). The South Atlantic Council is adjusting the ACL for golden tilefish in response to new information from SEDAR 25 (2011) and the SSC through Regulatory Amendment 12.

The National Standard 1 (NS 1) Guidelines indicate that the ACL cannot exceed the ABC recommendation provided by a Fishery Management Council's SSC. The actions taken in this Regulatory Amendment 12 would revise the OY/ACL definitions to be consistent with NS 1 and to optimize yield in the fishery. Regulatory Amendment 12 also includes alternatives for a commercial Annual Catch Target (ACT) where the target catch is set lower to account for management uncertainty due to continued commercial quota overages. This amendment also includes an action and alternatives to adjust the recreational Accountability Measures (AMs).

Chapter 2. Proposed Actions

2.1 Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Golden Tilefish

Alternative 1 (No Action). ACL and OY = yield at 75%F_{MSY}.

Alternative 2. ACL = OY = Acceptable Biological Catch (ABC).

Alternative 3. ACL = OY = 90% of the ABC.

Alternative 4. ACL = OY = 80% of the ABC.

Alternative 5. ACL = OY = yield at 75%F_{MSY} when stock is at equilibrium.

Comparison of Alternatives

Estimates of yield and productivity for fish stocks are available as both equilibrium and static values. Equilibrium values represent the yield expected, on average, over a long period from a given management strategy. Examples are quantities such as the Maximum Sustainable Yield (MSY) and Optimum Yield (OY). Static values represent the yield that can be taken at any given point in time and may be more or less than the equilibrium values. Examples are the yield estimated by stock assessment projections and presented as the result of a particular exploitation rate applied at a particular time. The important quantities in determining both static or equilibrium yield from a population are the amount of fish in the population, usually presented in stock biomass (weight), and the fishing pressure or rate of removal, usually presented as a rate (i.e., fishing mortality rate or F). Below are current values *when the stock is at equilibrium* for MSY and OY from the latest stock assessment based on specifications in Amendment 17B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 17B)(SAFMC 2010b).

MSY	= 638,000 pounds ww (596,643 pounds gw)
ACL and OY = yield at 75%F_{MSY}	= 625,000 pounds ww (558,036 pounds gw)

Alternatives 1 (No Action)-4 represent static estimates of ACL, where yield values are estimated by stock assessment projections (**Table 4-2**) The South Atlantic Fishery Management Council (South Atlantic Council) is also considering alternatives that set OY equal to the ACL under **Alternatives 1 (No Action)-5**. The National Standard 1 (NS 1) Guidelines state that if OY is set close to the MSY, which is the equilibrium value for OFL, the conservation and management measures in the fishery must have very good control of the amount of catch in order to achieve the OY without overfishing. The ACLs under **Alternatives 1 (No Action)** and **2** are greater than long-term equilibrium value of MSY.

Alternative 1 (No Action) would retain the definition of ACL = yield at 75% of F_{MSY} for golden tilefish. Based on the updated biomass information from SEDAR 25 (2011), examination of values for **Alternative 1 (No Action)** in **Table 4-2** reveals the yield at 75%F_{MSY} is not only greater than the MSY (638,000 pounds whole weight) but is also greater than the ABC specified by the South Atlantic Council/Scientific and Statistical Committee (SSC) ABC Control Rule. The NS 1 Guidelines indicate the ACL cannot exceed the catch level recommendations provided by a fishery management council's SSC. Therefore, **Alternative 1 (No Action)** would not meet the legal requirements of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and is not a viable alternative.

Alternative 2 would set the ACL/OY equal to the ABC. The NS 1 guidelines indicate ACL may typically be set very close to the ABC. This scenario is used for many other, mostly un-assessed, snapper grouper species but does not include a buffer to provide for management uncertainty. 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 B_{MSY}. To account for scientific uncertainty, the South Atlantic Council's SSC has recommended establishing the ABC, based on the ABC Control Rule, at a level that would result in a 35% probability of overfishing. **Table 4-2** reveals that the ABC recommended by the South Atlantic Council's SSC, using the Council's approved ABC Control Rule, results in the establishment of a large buffer between the OFL and ABC (average = 531,250 pounds ww) reflecting the high level of scientific uncertainty in the assessment results.

Alternatives 3, 4, and **5** would have a greater positive biological effect than **Alternative 2** because they would create a buffer between the ACL/OY and ABC that would account for management uncertainty. **Alternative 4** would set the most conservative ACL at 80% of the ABC. As shown in **Table 4-2**, there is a substantial buffer between the OFL and the ABC reflecting the high level of scientific uncertainty. The NS 1 guidelines indicate the ACL may typically be set very close to the ABC, when uncertainty is accounted for. 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 to ensure the OFL is not exceeded. During the 2011 season, the commercial overage was 26% and the recreational overage was 533% (**Table 4-1**) indicating a high level of management uncertainty.

Under **Alternatives 1 (No Action) - 4**, short-term yields in excess of equilibrium expectations represent windfall conditions that are typically short lived, as the natural tendency of the population is to return to, and vary around, the estimated equilibrium conditions for a given exploitation rate. Therefore, as the extra yield and stock biomass is removed, or "fished down", population abundance will decline. However, there is risk to this "fishing down" approach, because if managers overshoot the equilibrium biomass target, population biomass could drop below both target and limit levels and create an overfished situation. **Alternative 5** avoids this situation for golden tilefish by relying on the equilibrium estimate of 75% F_{MSY} to set ACL and OY. The alternative of using the estimated equilibrium values as a catch limit is a risk averse approach that sacrifices some yield over the short-term to gain stability over the long-term and prevent unrealistic expectations of fishery potential by constituents.

The magnitude of effects of the ACL/OY alternatives on business activity would directly correlate with the level of ACL. **Alternative 2** would provide the largest ACL (of the viable alternatives), and would result in the largest positive impacts on business activity for all states combined. The estimated economic effects of the various ACL/OY alternatives would directly correlate with the level of ACL as a percent of ABC. That is, the closer the ACL would be to ABC, the lower the consequent effects. **Alternative 2** sets the ACL equal to the ABC, the highest possible ACL, and would result in fewer short-term social impacts than under **Alternatives 3** and **4**, which each set the ACL at a percentage of the ABC and **Alternative 5** that sets the ACL at the equilibrium level.

Establishing sector ACLs and OY for golden tilefish would not have direct impacts on the administrative environment. Sector ACLs are already in place for golden tilefish, and commercial and recreational closures have taken place in the past. In general, the lower the ACL is set the more likely it is to be met or exceeded, and the more likely an Accountability Measure (AM) would be triggered, and therefore would have the greatest administrative impact.

Table 2-1. Summary of effects under **Action 1**.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action). ACL & OY = yield @ 75% F_{MSY}.	Is not consistent with Magnuson-Stevens Act and is not a viable alternative.	Is not consistent with Magnuson-Stevens Act and is not a viable alternative.
Alternative 2. ACL = OY = ABC.	Least biological benefits since no buffer between ACL & ABC.	Highest short-term benefits but could be lower in long-term given no buffer between ACL & ABC.
Alternative 3. ACL = OY = 90% of the ABC.	Biological benefits intermediate between **Alternatives 2** and **4** since 10% buffer between ACL & ABC.	Short-term benefits intermediate between **Alternatives 2** and **4** but higher in long-term given a 10% buffer between ACL & ABC.
Alternative 4. ACL = OY = 80% of the ABC.	Highest biological benefits since 20% buffer between ACL & ABC.	Lowest short-term benefits but higher in long-term given a 20% buffer between ACL & ABC.
Alternative 5. ACL = OY = yield @ 75% F_{MSY} when stock is at equilibrium.	High, sustainable biological benefits since the ACL is set at the yield at 75%F_{MSY} when stock is at equilibrium and there is a buffer between ACL & ABC.	Sustainable short-term and long-term benefits since the ACL is set at 75%F_{MSY} when stock is at equilibrium and there is a buffer between ACL & ABC.

2.2 Action 2. Establish an Annual Catch Target (ACT) for the Golden Tilefish Commercial Sector

Alternative 1 (No Action). No commercial Annual Catch Target (ACT) currently exists for golden tilefish.

Alternative 2. Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector = 90% of the commercial sector ACL.

Alternative 3. Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector = 75% of the commercial sector ACL.

Alternative 4. Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector = 50% of the commercial sector ACL.

Comparison of Alternatives

Under **Alternative 1 (No Action)** there is no commercial ACT for golden tilefish to help ensure the ACL is not exceeded and AMs are triggered. A commercial ACT is not necessary if the commercial sector landings are closely tracked in-season through a quota monitoring system and projections occur in a timely manner to close the commercial golden tilefish sector before landings exceed the ACL. There have been overages in the commercial sector every year since the quota was reduced in 2006 (Amendment 13C; SAFMC 2006) (**Table 4-8**); however, the South Atlantic Council and Gulf of Mexico Fishery Management Council are developing a dealer reporting amendment, which is intended to provide more timely and accurate data reporting to reduce the incidence of commercial ACL overages. The preliminary estimates of ACL overage for 2011 are 26% commercial and 533% recreational; final numbers will be available in mid-2012 (**Table 4-1)**.

Setting a commercial ACT between 90% and 50% of the ACL (**Alternatives 2-4**), and closing golden tilefish when the value is reached would provide greater assurance overfishing would not occur and AMs would not be triggered. Establishing an ACT that is 50% of the ACL (**Alternative 4**) would be the most conservative ACT among the alternatives considered. Examination of the values in **Table 4-6** reveals that **Alternative 4** would provide a commercial ACT that is similar to the current quota (282,819 pounds gutted weight; 316,757 pounds whole weight). **Alternative 4** would be expected to have the greatest beneficial effect for the golden tilefish stock among **Alternatives 2-4**; whereas, **Alternative 1 (No Action)** would be expected to have the least positive biological effects.

The greatest economic benefit for commercial fishermen would be to set an ACT as close to the ACL as possible so long as the ACL was not exceeded. If catches exceed ACT and Accountability Measures (AMs) are triggered, any gains from the excess landings in one year would be offset by potential reductions in the next. It is in the commercial sector's best economic interest to catch the total landings allowed by an ACT (or the ACL if ACT = ACL).

There is an increasing possibility of negative short-term social effects going from **Alternative 2** to **Alternative 4**. Some of those effects are similar to other thresholds being met and may involve switching to other species or discontinuing fishing altogether. Although these are common responses to closures, it is not known how fishermen may respond if closures are anticipated for several different species or groups. There could be a domino effect as one closure forces them to switch to another species, which closes as thresholds are met with the added fishing pressure.

Under **Alternative 1 (No Action)** there is no ACT for the commercial sector. Because the commercial sector for the golden tilefish component of the snapper grouper fishery is already tracked through the quota monitoring system, in-season management for the commercial sector should be feasible without the use of an ACT, particularly once measures are established to enhance dealer reporting (targeted for January 1, 2013). However, under existing reporting requirements, the commercial sector exceeded the commercial sector ACL in 2011 by 26% based on preliminary landings data (**Table 4-1**). Establishing an ACT for the commercial sector as proposed under **Alternatives 2-4**, would result in a very slightly increased administrative burden beyond the status quo, since an additional reference point would need to be monitored.

Table 2-2. Summary of effects under **Action 2**.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action). No commercial ACT currently exists.	Negative biological effects possible if overfishing results from continued overages.	Highest short-term benefits but possible negative long-term benefits if overfishing results from continued overages.
Alternative 2. Commercial ACT = 90% commercial ACL.	Negative biological effects lower than **Alternative 1 (No Action)**.	Short-term benefits lower than **Alternative 1 (No Action)** but higher than **Alternatives 3** and **4**. Positive long-term benefits since risk of lower landings due to quota overages is reduced.
Alternative 3. Commercial ACT = 75% commercial ACL.	Negative biological effects intermediate between **Alternatives 2** and **4**.	Lower short-term benefits than **Alternative 4** but higher positive long-term benefits since risk of lower landings due to quota overages is reduced.
Alternative 4. Commercial ACT = 50% commercial ACL.	Least negative biological effects since 50% buffer between ACL & ACT and greatest assurance that ACL is not exceeded.	Least short-term benefits but most positive long-term benefits.

2. 3 Action 3. Revise Recreational Accountability Measures (AMs) for Golden Tilefish

Alternative 1 (No Action). Do not revise current recreational AMs for golden tilefish.

If the recreational ACL is exceeded, the Regional Administrator (RA) shall publish a notice to reduce the length of the following recreational fishing season by the amount necessary to ensure landings do not exceed the recreational sector ACL for the following fishing season. Compare the recreational ACL with projected recreational landings over a range of years. For 2010, use only 2010 landings. For 2011, use the average landings of 2010 and 2011. For 2012 and beyond, use the most recent three-year running average.

Alternative 2. Specify the recreational in-season AM trigger.

Sub-alternative 2a. Do not specify an AM trigger.

Sub-alternative 2b (Preferred). If the annual landings exceed the ACL in a given year.

Alternative 3. Specify the recreational in-season AM.

Sub-alternative 3a. Do not specify an in-season AM.

Sub-alternative 3b (Preferred). The Regional Administrator (RA) shall publish a notice to close the recreational sector when the ACL is projected to be met.

Alternative 4. Specify the recreational post-season AM.

Sub-alternative 4a (Preferred). Monitor following year and shorten season as necessary. If the ACL is exceeded, the following year's recreational landings would be monitored in-season for persistence in increased landings. The Regional Administrator (RA) will publish a notice to reduce the length of the recreational fishing season as necessary.

Sub-alternative 4b. Payback. If the recreational ACL is exceeded, and golden tilefish are overfished, the Regional Administrator (RA) shall publish a notice to reduce the recreational ACL in the following season by the amount of the overage.

Comparison of Alternatives

Alternative 1 (No Action) would not change the current system of recreational Accountability Measures (AMs). The primary modification to the system of recreational AMs for golden tilefish under **Alternatives 2-4** is the elimination of the use of the three-year running average to determine ACL overages. Eliminating the three-year average would result in a reduced risk of implementing overly conservative AMs when they are not needed. The three-year running average could be heavily influenced by a single year's anomalously high or low landings, which may or may not be due to actual increased harvest or statistical variation. Variability in recreational data is accounted for under **Alternative 4** because corrective post-season action would ensure that any recreational ACL overage is taken into consideration when establishing the ACL for the following season via either a shortened season or a payback provision. The most biological benefits would result under the combination of **Sub-alternatives 2b (Preferred)**, **3b (Preferred)** and **4b**.

Accountability Measures (AMs) would have direct economic effects on fishing participants, because they would affect the allowed harvest or fishing opportunities for golden tilefish. These economic effects would generally be immediate with in-season AMs and would be delayed if only post-season AMs were implemented.

The setting of AMs can have significant direct and indirect effects on the social environment as they usually impose some restriction on harvest, during either the current season or the next. The long-term effects should be beneficial as they provide protection from further negative impacts on the stock. 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.

In-season AMs **(Alternative 3)** for the recreational sector are the most administratively difficult to implement in a timely manner because (1) the private recreational data are available 45 days after the end of a 2-month wave after the data are processed, reviewed, and ready for use by fishery managers and (2) the headboat data are available as resources allow the data to be keypunched and analyzed. In-season recreational AMs for golden tilefish would rely heavily on projections of when the ACL would be met during the fishing season, which would be associated with a high degree of uncertainty. The remaining alternatives and sub-alternatives proposed under this action would have similar administrative impacts to the status quo.

Table 2-3. Summary of effects under **Action 3**.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Alternative 1 (No Action). Reduce length of following season and use 3-year running average.	Possible biological benefits due to reduction of fishing season if ACL exceeded with 3-year average.	Possible negative short-term and long-term impacts due to reduction of fishing season if ACL exceeded with 3-year average.
Sub-alternative 2a. No AM trigger.	Least amount of biological benefits.	High short-term indirect benefits but diminishing long-term benefits due to potential ACL overages. Negative impacts greater than **Sub-alternative 2b (Preferred)**.
Sub-alternative 2b (Preferred). If landings exceed ACL in given year.	Does not address anomalous spikes in landings; only one year's data used to determine trigger.	Negative short-term indirect economic effects but less than **Alternative 1 (No Action)**. Increased socioeconomic benefits over time due to avoidance of unnecessary AMs being triggered.
Sub-alternative 3a. No in-season AM.	May have negative effects since there would be less of a chance that ACL overages are prevented.	Short-term benefits higher than under **Sub-alternative 3b (Preferred)** but lower long-term benefits due to potential ACL overages
Sub-alternative 3b (Preferred). Regional Administrator closes recreational sector when ACL projected to be met.	High biological benefits due to greater assurance that the ACL will not be exceeded.	Lower short-term benefits than under **Sub-alternative 3a** but higher long-term by preventing ACL overages.

Alternatives	Biological Effects	Socioeconomic/Administrative Effects
Sub-alternative 4a (Preferred). Monitor following year and shorten season as necessary.	Moderate biological benefits since the following fishing season and associated mortality is addressed.	Ensures that AMs are triggered when absolutely necessary; beneficial in the short term but lower benefits over long term due to potential ACL overages.
Sub-alternative 4b. Payback. If recreational ACL exceeded, and golden tilefish are overfished, reduce the recreational ACL in the following season.	Highest biological benefit by reducing the following year ACL by the amount of the overage; critical if stock is overfished.	Negative short-term impacts higher than **Sub-alternative 4a (Preferred)** but higher long-term benefits by ensuring resource sustainability

Chapter 3. Affected Environment

The affected environment for the snapper grouper fishery has recently been described in the Comprehensive Annual Catch Limit (ACL) Amendment (SAFMC 2011c), Amendment 17B (Amendment 17B) to the Fishery Management Plan for the Snapper Grouper of the South Atlantic Region (SAMFC 2010b), and the Fishery Ecosystem Plan (FEP) of the South Atlantic Region (SAMFC 2009b). Those descriptions of the biological, social, economic, and administrative environments are herein incorporated by reference. Copies are available from the South Atlantic Fishery Management Council's (South Atlantic Council) Web site (www.safmc.net).

3.1 Habitat Environment

Many deepwater 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. More detail on these habitat types can be found in Amendment 17B (SAFMC 2010b), the Comprehensive Annual Catch Limit (ACL Amendment (SAFMC 2011b), and Volume II of the Fishery Ecosystem Plan (SAFMC 2009b), and are incorporated by reference.

3.2 Biological and Ecological Environment

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

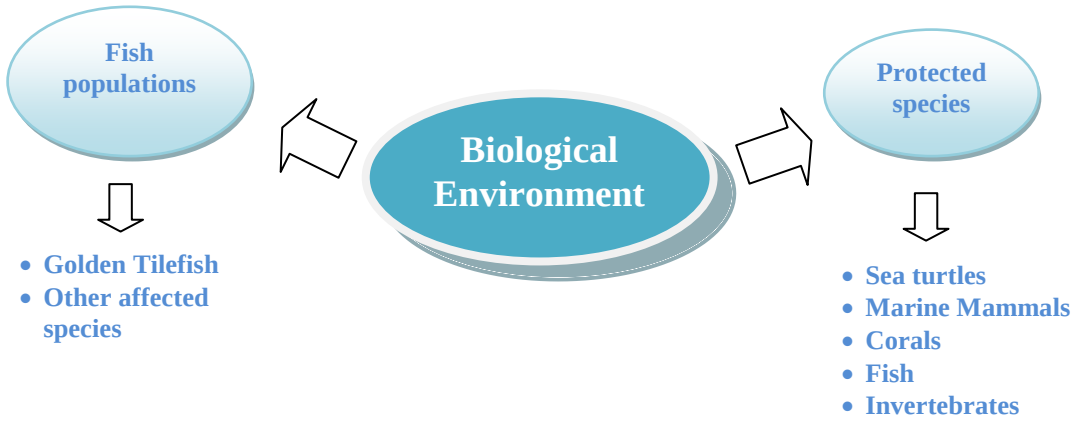


Figure 3-1. Two components of the biological environment described in this amendment.

3.2.1 Golden Tilefish

Golden tilefish (*Lopholatilus chamaeleonticeps*) are distributed throughout the Western Atlantic, occurring as far north as Nova Scotia, to southern Florida, and in the eastern Gulf of Mexico (Robins and Ray 1986). According to Dooley (1978), golden tilefish occur at depths of 80-540 meters (263-1,772 feet). Robins and Ray (1986) report a depth range of 82-275 meters (270-900 feet) for golden tilefish. Golden tilefish are most commonly found at about 200 meters (656 feet), usually over mud or sand bottom but, occasionally, over rough bottom (Dooley 1978).

Maximum reported size is 125 centimeters (50") total length and 30 kilograms (66 pounds) (Dooley 1978; Robins and Ray 1986). Maximum reported age is 40 years (Harris et al. 2001). Radiocarbon aging indicates golden tilefish may live for at least 50 years (Harris, South Carolina Department of Natural Resources, personal communication). A recent Southeast Data Assessment and Review (SEDAR) assessment estimated natural mortality (M) at 0.10 (SEDAR 25 2011). Golden tilefish spawn off the southeast coast of the U.S. from March through late July, with a peak in April (Harris et al. 2001). Grimes et al. (1988) indicate peak spawning occurs from May through September in waters north of Cape Canaveral. Golden tilefish primarily prey upon shrimp and crabs, but also eat fishes, squid, bivalves, and sea cucumbers (Dooley 1978).

3.2.1.1 How was the Stock Assessment Done?

Golden tilefish were assessed through the Southeast Data, Assessment, and Review (SEDAR) process in 2011, using data through 2010 (SEDAR 25 2011). A previous stock assessment was conducted in 2004, using data through 2002 (SEDAR 4 2004).

SEDAR is a cooperative Fishery Management Council process initiated 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 Councils manage SEDAR in coordination with NOAA Fisheries Service 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**/process, 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. The third and final stage 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, is then forwarded to the Fishery Management Council's Scientific and Statistical Committee (SSC). The SSC considers whether the assessment represents the Best Scientific Information Available (BSIA) and develops fishing level recommendations for a Council's 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.

3.2.1.2 Golden Tilefish Assessment History

The first stock assessment for golden tilefish was conducted in 1990 (PDT 1990) using data from 1972 through 1988/89. Spawning Stock Ratio (SSR) (SSR is considered to be the same as Spawning Potential Ratio (SPR)) was only calculated for the commercial fishery: (a) Carolinas = 35%, (b) North Florida = 28%, and (c) South Florida = 42%. A series of stock assessments conducted by NMFS (1991), Huntsman et al. (1992), and Potts and Brennan (2001) provided estimates of SSR/SPR based on catch curves:

Assessment Year	Catch Data From	Overall SSR
1991	1988	31%
1992	1990	21%
2001	2000	20-34%

In 2004, golden tilefish was assessed as part of SEDAR 4, using landings, age, length, and abundance index data through 2002 (SEDAR 2004). For the 2004 assessment, two models were considered: (1) a statistical catch-at-age (SCAA) model and (2) an age-aggregated production model. The results of the primary SCAA model indicated overfishing of the resource post-1988 with spawning stock biomass hovering right around the value corresponding to the maximum sustainable yield (MSY) for that same time. The terminal 2002 model estimates suggested the golden tilefish stock was undergoing overfishing and that the stock was very close to the overfished definition. Static SPR in the 2004 assessment was estimated to be about 31% in 2002.

3.2.1.3 Golden Tilefish Current Status

The recent assessment (SEDAR 25 2011) of the golden tilefish stock indicated that the U.S. southeast stock of tilefish is currently **not overfished** and **overfishing is not occurring**.

Estimated time series of stock status (spawning stock biomass (SSB)/minimum stock size threshold (MSST)) shows a decline in the early 1980s, and then an increase since the mid-2000s (**Figure 3-2**). Estimates of spawning biomass were below the minimum stock size threshold (MSST) from 1993 through 2003. Current stock status was estimated to be $SSB_{2010}/MSST = 2.43$. If this ratio is greater than one, then the stock is not overfished. The uncertainty analysis suggested that the estimate of a stock that is not overfished (i.e., SSB > MSST) is robust. Age structure estimated by the model shows fewer older fish than the (equilibrium) age structure expected at MSY. However, in the terminal year (2010), ages 1-7 approached the MSY age structure.

The estimated time series of fishing mortality (F)/fishing mortality that will produce MSY (F_{MSY}) suggests that overfishing has occurred throughout some of the assessment period (**Figure 3-3**). Spikes in the early 1980s through 2004 are due primarily to the longline fleet. Current fishery status in the terminal year, with current F represented by the geometric mean from 2008-2010, is estimated to be $F_{2008\text{-}2010}/F_{MSY} = 0.36$. If this ratio is below one, then the stock is not undergoing overfishing. This estimate indicates that overfishing is not occurring and appears robust across the uncertainty analyses.

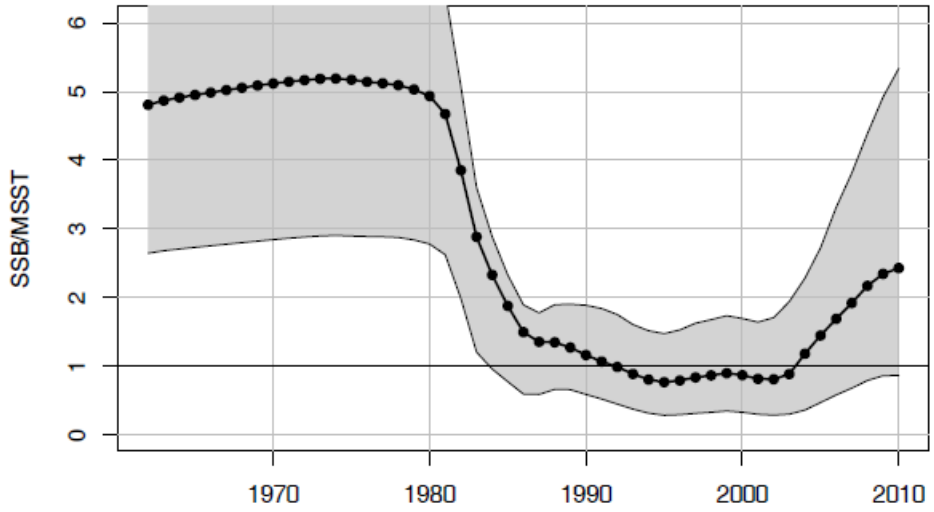


Figure 3-2. Trends in golden tilefish spawning biomass (SSB) relative to the minimum stock size threshold (MSST) from Figure 3-24 of SEDAR 25 (2011). Solid line indicates estimates from base run of the Beaufort Assessment Model; gray error bands indicate 5th and 95th percentiles of the Monte Carlo and bootstrap trials.

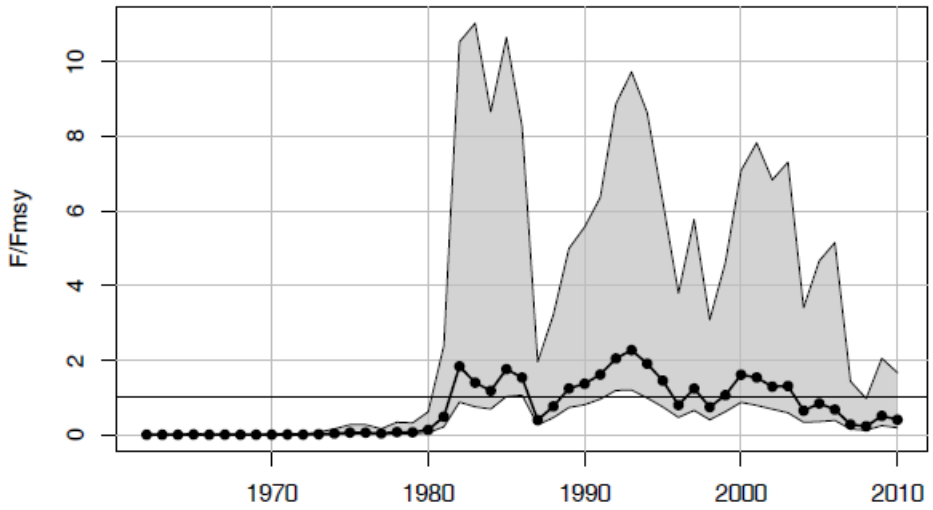


Figure 3-3. Trends in golden tilefish fishing mortality relative to F_{MSY} of golden tilefish from SEDAR 25 (2011). Solid line indicates estimates from base run of the Beaufort Assessment Model; gray error bands indicate 5th and 95th percentiles of the Monte Carlo and bootstrap trials.

The South Atlantic Council's Scientific and Statistical Committee (SSC) reviewed the assessment results during their November 8-10, 2011 meeting in Charleston, South Carolina. Their findings, *directly from their written report*, for golden tilefish are as follows:

☐ Consider whether the assessments represent Best Scientific Information Available. SSC recommendations are taken into consideration by the agency when determining "BSIA".

SSC RECOMMENDATION:

Golden Tilefish: ***Satisfied with data used in assessment. Satisfied the assessment team sufficiently explored the uncertainties in the data. Endorse the use of this assessment as representing BSIA***.

☐ Apply the ABC control rule and recommend ABC and OFL.

SSC RECOMMENDATION:

Golden Tilefish: ***Recommend OFL = yield at Fmsy. Assessment is a valid basis for P* approach. Assessment Info = Tier 1, Uncertainty Characterization = Medium (Tier 3), Stock Status = Tier 1, Productivity and Susceptibility = High Risk (Tier 3). P* = 0.35***

☐ Provide Fishing Level Recommendations for assessed stocks; include discussion of uncertainties and their consequences.

SSC RECOMMENDATION:

Golden Tilefish: ***SSC accepts the base run and the recommendations of the Review Panel. The SSC recommends using the values from the Review report. The projections of yield for the P* level were not available; however, Dr. Williams reported they would be provided to the Council. There was concern with using an input steepness (i.e., steepness was not internally estimated by the model), but the uncertainty in that value is taken into consideration during the MCB analysis. If this is a species that has a dominant year class (or several)***

every 10-20 years, the Council may want to take caution in nursing that year class through. By hitting the dominant class too strongly, it could affect the next dominant year class and depress biomass for long periods of time. Should be wary of actual recruitment, biomass, and F patterns, but final determination of stock status seems reasonable. Support the use of video survey for adult tilefish. Recommend that future stock structure research be based on microchemistry tagging studies instead of genetics.

Fishing Level Recommendations Table: Tilefish

Criteria	Recommended Values from SEDAR 25	
	Definition	Value
M (Instantaneous natural mortality; per year)	Average of Lorenzen M	0.10
$F_{current}$ (per year)	Geometric mean of the apical fishing mortality rates in 2008 - 2010	0.070
F_{MSY} (per year)	F_{MSY}	0.185
B_{MSY} (metric tons)	Biomass at MSY	2918
SSB_{2010} (metric tons)	Spawning stock biomass (female gonad wt, mt) in 2010	54.8
SSB_{MSY} (metric tons)	SSB_{MSY}	25.3
MSST (metric tons)	(1-M)*SSB_{MSY}	22.6
MFMT (per year)	F_{MSY}	0.185
MSY (1000 pounds)	Yield at MSY	638
OY (1000 pounds)	Yield at F_{OY}	OY (65% F_{MSY})= 610 OY (75% F_{MSY})= 625 OY (85% F_{MSY})= 634
F_{OY} (per year)	F_{OY} = 65%,75%, 85% F_{MSY}	65% F_{MSY}= 0.120 75% F_{MSY}= 0.139 85% F_{MSY}= 0.157
Biomass Status	SSB_{2010}/MSST	2.43
Exploitation Status	$F_{current}/F_{MSY}$	0.36

3.2.2 Other Fish Species Affected

Golden tilefish are primarily taken with longline gear over mud habitat where no other snapper grouper species commonly occur. However, longline gear is also deployed in mud and rock habitat where snowy grouper (*Epinephelus niveatus*), blueline tilefish (*Caulolatilus microps*), and yellowedge grouper (*Epinephelus flavolimbatus*) may be caught along with golden tilefish. A detailed description of the life history of these species is provided in Volume II of the South Atlantic FEP (SAFMC 2009b).

3.2.3 Protected Species

There are 31 different species of marine mammals that may occur in the EEZ of the South Atlantic region. All 31 species are protected under the Marine Mammal Protection Act (MMPA) and six are also listed as endangered under the ESA (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales). In addition to those six marine mammals, five species of sea turtle (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish; the Atlantic sturgeon; and two *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]) are protected under the ESA. Portions of designated critical habitat for North Atlantic right whales and *Acropora* corals also occur within the South Atlantic Council's jurisdiction. Descriptions of the life history characteristics of the protected species can be found in the FEP (SAMFC 2009b) and in the Comprehensive ACL Amendment (SAFMC 2011b), and are herein incorporated by reference.

3.3 Human Environment

Information on the commercial snapper grouper fishery is contained in previous amendments [Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Amendment 17B (SAFMC 2010b), and the Comprehensive ACL Amendment (SAFMC 2011c)] and is incorporated herein by reference. Recent information that focuses on golden tilefish is included as Appendix D.

3.4 Social and Cultural Environment

Descriptions of the social and cultural environment of the snapper grouper fishery are contained in Jepson et al. (2005) and Amendment 17B (SAFMC 2010b), and are incorporated herein by reference. Because so many communities in the South Atlantic benefit from snapper grouper fishing, discussion of affected communities focuses on "indicator communities", defined as communities thought to be most heavily impacted by snapper grouper regulations.

3.5 Administrative Environment

Descriptions of the administrative environment are contained in the Comprehensive ACL Amendment (SAFMC 2011c) and Amendment 17B (SAFMC 2010b), and are incorporated herein by reference.

Chapter 4. Environmental Consequences

4.1 Action 1. Revise Annual Catch Limit (ACL) and Optimum Yield (OY) for Golden Tilefish

Alternative 1 (No Action). ACL and OY = yield at 75%F_{MSY}.

Alternative 2. ACL = OY = Acceptable Biological Catch (ABC).

Alternative 3. ACL = OY = 90% of the ABC.

Alternative 4. ACL = OY = 80% of the ABC.

Alternative 5. ACL = OY = yield at 75%F_{MSY} when stock is at equilibrium.

Discussion

This action (**Alternatives 1-4**) was being considered in Amendment 18B. **Alternative 5** is new.

4.1.1 Biological Effects

The assessment of the golden tilefish stock in the South Atlantic (SEDAR 25 2011), completed in 2011 using data through 2010, indicated the stock is **not overfished** and is **not undergoing overfishing**. The stock assessment results show that the biomass of golden tilefish has increased substantially since the last assessment and is now above B_{MSY} (**Figure 4-1**).

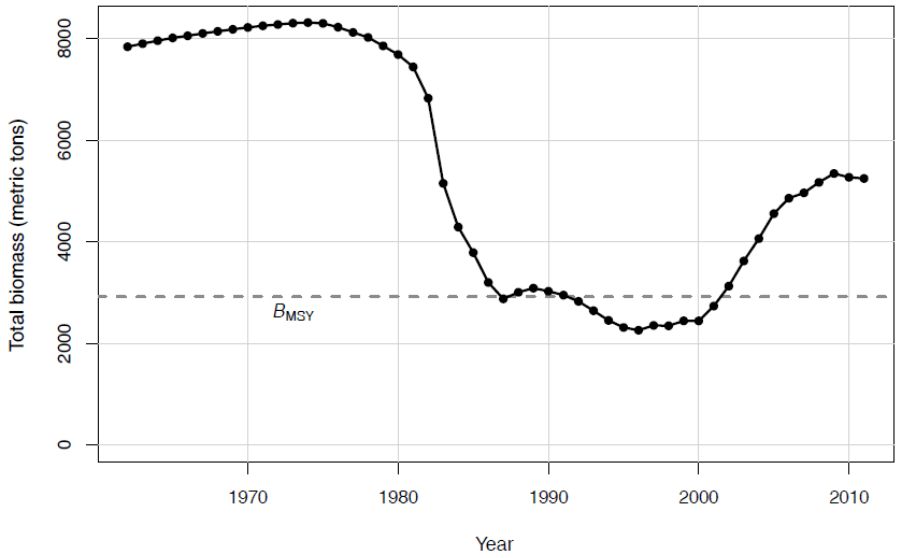


Figure 4-1. Estimated total biomass (metric tons) at start of year. Horizontal dashed line indicates B_{MSY}. Source: Figure 3-11, SEDAR 25 (2011).

Preliminary landings for 2011 are shown in **Table 4-1**; the commercial overage is estimated to be 26% and the recreational overage is estimated to be 533%. Final catch data for 2011 will be available in mid-2012.

Results from the recent stock assessment (SEDAR 25 2011) suggest the current ACLs (commercial ACL = 282,819 pounds gutted weight (gw); recreational ACL = 1,578 fish) can be increased. The South Atlantic Fishery Management Council's (South Atlantic Council) Scientific and Statistical Committee (SSC) has recommended establishing the Acceptable Biological Catch (ABC, based on the South Atlantic Council/SSC ABC Control Rule, at a level that would result in a 35% probability (P*) of overfishing. The overfishing limit (OFL) is specified by the South Atlantic Council's SSC based on the yield at F_{MSY}. Values for OFL for 2012-2015, based on the most recent stock assessment (SEDAR 25 2011), are shown in **Table 4-2**.

Table 4-1. Total commercial and recreational preliminary landings and overages of golden tilefish in 2011. Values are in pounds whole weight (ww) (conversion factor for gutted weight for golden tilefish is 1.12).

	Commercial ACL (ww)	Recreational ACL (No. fish)	Recreational ACL (ww)	Total ACL Pounds (ww)
Amendment 17B ACL	316,757	1,578	9,797	326,554
Landings in 2011	399,664		62,007	461,671
Overage in pounds	82,907		52,208	135,114
% Overage in 2011	26%		533%	41%

Source: Commercial, Recreational & Total ACL from Amendment 17B (SAFMC 2010b). Preliminary 2011 landings from NMFS SEFSC Projection Analyses, Appendix G.

Taking the increase in biomass and preliminary estimates of overages in 2011 into account, the projected values for ABC and ACL, provided by the Southeast Fisheries Science Center (SEFSC) on January 27, 2012 (**Appendix G**) based on SEDAR 25 (2011), are shown in **Table 4-2**. Currently there is no ABC or OFL specified for golden tilefish.

The South Atlantic Council's Scientific and Statistical Committee (SSC reviewed the assessment results and "accepts the base run and the recommendations of the Review Panel. The SSC recommends using the values from the Review report." The final SEDAR 25 SAR Section III Assessment Workshop Report shows projections in Table 3.17 (**Appendix G**) for the year 2011 through 2030. The SSC did not provide any specific guidance on how far into the future to use the projections. NOAA/NMFS Southeast Fisheries Science Center (SEFSC) provided Interim Tilefish Projections dated January 5, 2012 (**Appendix G**) with projections for 2011 through 2020, dropping the 2021 through 2030 values because "In general, projections of fish stocks are highly uncertain, particularly in the long term (e.g., beyond 5-10 years)". The interim projections covered 10 years and the ABC decreases each year from a high of 789,000 pounds whole weight in 2012 to 646,000 pounds whole weight in 2020. Projections using the South Atlantic Council/SSC ABC Control Rule with a probability of overfishing (P*) of 35% were provided by NOAA/NMFS SEFSC on January 27, 2012 (**Appendix G**). The number of years projected were 5 (2011 through 2015) presumably again based on the concern due to high uncertainty beyond 5-10 years. The final P* values for ABC shown in **Table 4-2** are lower than the interim values due to the P* methodology better addressing the level of scientific uncertainty associated with recruitment than the interim methodology.

Table 4-2. Proposed ACL levels for 2012-2015 based on projections of yield at F_{MSY} (OFL), equilibrium yield at 75%F_{MSY} from SEDAR 25, and ABC from SEFSC (January 27, 2012; Appendix G). Values are in pounds whole weight (conversion factor for gutted weight for golden tilefish is 1.12).

Year	OFL	Total ABC	Alternative 1 (Am17B) Status Quo ACL=75%F_{MSY}	Alternative 2 ACL=OY= ABC	Alternative 3 ACL=OY= 90%ABC	Alternative 4 ACL=OY= 80%ABC	Alternative 5 ACL= Equilibrium 75% F_{MSY}
2012	1,386,000	668,000	1,062,000	668,000	601,200	534,400	625,000
2013	1,242,000	669,000	991,000	669,000	602,100	535,200	625,000
2014	1,124,000	666,000	931,000	666,000	599,400	532,800	625,000
2015	1,031,000	655,000	880,000	655,000	589,500	524,000	625,000
Avg 2012-15	1,195,750	664,500	966,000	664,500	598,050	531,600	625,000

The proposed ACLs shown in **Table 4-2** are allocated using the existing recreational (3%) and commercial (97%) split. The resulting commercial and recreational sector ACLs are shown in **Table 4-3**.

Table 4-3. Proposed commercial and recreational ACL levels for Alternatives 2-5 for 2012-2015 based on projections of ABC from SEFSC (January 27, 2012). Commercial values are in pounds whole weight (conversion factor for gutted weight for golden tilefish is 1.12). Recreational values are number of fish. A conversion factor of 6.21 from SEFSC (January 27, 2012; Appendix G) is used to convert weight to numbers of fish. Allocation is 97% commercial and 3% recreational.

	Alternative 2 (ACL=ABC)		Alternative 3 (ACL=90% ABC)		Alternative 4 (ACL=80% ABC)		Alternative 5 (ACL=Yield@75% Fmsy)	
Year	Comm (lbs ww)	Rec (# fish)	Comm (lbs ww)	Rec (# fish)	Comm (lbs ww)	Rec (# fish)	Comm (lbs ww)	Rec (# fish)
2012	647,960	3,227	583,164	2,904	518,368	2,582	606,250	3,019
2013	648,930	3,232	584,037	2,909	519,144	2,586	606,250	3,019
2014	646,020	3,217	581,418	2,896	516,816	2,574	606,250	3,019
2015	635,350	3,164	571,815	2,848	508,280	2,531	606,250	3,019
Average	644,565	3,210	580,109	2,889	515,652	2,568	606,250	3,019

Estimates of yield and productivity for fish stocks are available as both equilibrium and static values. Equilibrium values represent the yield expected, on average, over a long period of time from a given management strategy. Examples are quantities such as the Maximum Sustainable Yield (MSY) and Optimum Yield (OY). Static values represent the yield that can be taken at any given point in time and may be more or less than the equilibrium values. Examples are the yield estimated by stock assessment projections and presented as the result of a particular exploitation rate applied at a particular time. The important quantities in determining both static or equilibrium yield from a population are the amount of fish in the population, usually presented in stock biomass (weight), and the fishing pressure or rate of removal, usually presented as a rate (i.e., fishing mortality rate or F). Below are current values *when the stock is at equilibrium* for MSY and OY from the latest stock assessment based on specifications in Amendment 17B to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Amendment 17B)(SAFMC 2010b).

MSY = 638,000 pounds ww (596,643 pounds gw)
ACL and OY = yield at 75%F_{MSY} = 625,000 pounds ww (558,036 pounds gw)

Fisheries managers often limit fishing mortality rates to manage stocks, thereby attempting to exert influence over one of the values necessary to determine yield. The other value, population biomass, is expected to vary over time in response to environmental, stock, and fishery conditions. Both equilibrium and static values are useful to managers, as the former provides an indication of the long-term goal and the latter provides a more up-to-date indication of a stock's performance.

Alternatives 1 (No Action)-4 represent static estimates of ACL, where yield values are estimated by stock assessment projections (**Table 4-2**). The South Atlantic Council is also considering alternatives that set OY equal to the ACL under **Alternatives 1-5**. The National Standard 1 (NS 1) Guidelines state that if OY is set close to the MSY, which is the equilibrium value for OFL, the conservation and management measures in the fishery must have very good control of the amount of catch in order to achieve the OY without overfishing. The ACLs under **Alternatives 1 (No Action)** and **2** are greater than long-term equilibrium value of MSY.

Alternative 1 (No Action) would retain the definition of ACL = yield at 75% of F_{MSY} for golden tilefish. Based on this ACL definition, Amendment 17B (SAFMC 2010b) established an overall ACL of 326,557 pounds whole weight (ww) where 316,757 pounds ww (282,819 lbs gutted weight (gw)) is allocated to the commercial sector (97%), and 9,799 pounds ww (1,578 fish) is allocated to the recreational sector. Based on the updated biomass information (SEDAR 25 2011), examination of values for **Alternative 1 (No Action)** in **Table 4-2** reveals the yield at 75%F_{MSY} is not only greater than the MSY (638,000 pounds whole weight) but is also greater than the ABC specified by the South Atlantic Council/SSC ABC Control Rule. The NS 1 Guidelines indicate the ACL cannot exceed the catch level recommendations provided by a fishery management council's SSC. Therefore, **Alternative 1 (No Action)** would not meet the legal requirements of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and is not a viable alternative.

Alternative 2 would set the ACL/OY equal to the ABC. The NS 1 guidelines indicate ACL may typically be set very close to the ABC. This scenario is used for many other snapper grouper species but does not include a buffer to provide for management uncertainty since scientific uncertainty has been considered when specifying ABC through the South Atlantic Council's ABC control rule. 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 B_{MSY}. The NS 1 guidelines state that 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.

To account for scientific uncertainty, the South Atlantic Council's SSC has recommended establishing the ABC, based on the ABC Control Rule, at a level that would result in a 35% probability of overfishing. **Table 4-2** reveals that the ABC recommended by the South Atlantic Council's SSC results in the establishment of a large buffer between the OFL and ABC (average = 531,250 pounds ww) reflecting the high level of scientific uncertainty in assessment results. Therefore, the ABC would have to be exceeded by about 44% (based on average 2012-2015 data) for the OFL to be exceeded. There have been overages in the commercial sector every year since the quota was reduced in Amendment 13C (SAFMC 2006), which has historically represented the majority of the golden tilefish catch (**Tables 4-1, 4-4, and 4-8**). For example, **Table 4-1** indicates the commercial quota was exceeded by 26% in 2011. The South Atlantic and Gulf of Mexico

Fishery Management Councils are developing a generic dealer reporting amendment, which is intended to provide more timely and accurate data reporting to reduce the incidence of quota overages. The target date for implementation of improved quota monitoring is January 1, 2013.

Alternatives 3, 4, and **5** would have a greater positive biological effect than **Alternative 2** because they would create a buffer between the ACL/OY and ABC that would account for the current level of management uncertainty. **Alternative 4** would set the most conservative ACL at 80% of the ABC. As shown in **Table 4-2**, there is a substantial buffer between the OFL and the ABC. The NS 1 guidelines indicate ACL may typically be set very close to the ABC, when uncertainty is accounted for. 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 to ensure the OFL is not exceeded. During the 2011 season the commercial overage was 26% and the recreational overage was 533% (**Table 4-1**) indicating a high level of management uncertainty.

For stocks that are overfished, where biomass is below a desired threshold, static estimates of yield will be below equilibrium estimates for the same exploitation rate. On the other hand, biomass of stocks that are not overfished may exceed the expected equilibrium or average conditions. Under such conditions, the stock is capable, for a short time, of returning yields that exceed those at equilibrium.

The latest assessment (SEDAR 25 2011) indicated golden tilefish is not overfished and biomass is above equilibrium or average conditions. Under **Alternatives 1 (No Action)-4**, short-term yields in excess of equilibrium expectations represent windfall conditions that are typically short lived, as the natural tendency of the population is to return to, and vary around, the estimated equilibrium conditions for a given exploitation rate. Therefore, as the extra yield and stock biomass is removed, or "fished down", population abundance will decline. As demonstrated in **Table 4-2**, declining population abundance results in declining yield under **Alternatives 1 (No Action)-4** in subsequent years. Under **Alternatives 1 (No Action)-4**, managers would be faced with regularly declining yield until the population reaches the equilibrium point, at which time harvest would be maintained at the equilibrium value. However, there is risk to this "fishing down" approach, because if managers overshoot the equilibrium biomass target, population biomass could drop below both target and limit levels and create an overfished situation. These risks can be substantial, as normal lags in data and population analyses could be such that a stock falls considerably below the target level before managers realize there is a problem. Moreover, one of the biggest challenges in fisheries management is reducing harvest, especially when constituents have become accustomed to higher levels and are experiencing an abundant stock.

Alternative 5 avoids this situation for golden tilefish by relying on the equilibrium estimate of yield at 75% of F_{MSY} to set ACL and OY. Stocks with this status are expected to vary around the target biomass levels, meaning that in some years, static yield would be more than equilibrium levels and in others, it would be less. Managers could attempt to chase that yield up and down, but delays in data, analyses, and management action make such a strategy impractical. The alternative of using estimated equilibrium values as a catch limit is a risk averse approach that sacrifices some yield over the short term to gain stability over the long-term and prevent unrealistic expectations of fishery potential by constituents.

Revising the ACL is not expected to negatively affect any species listed under the Endangered Species Act.

Table 4-4. Commercial and recreational landings (in pounds whole weight) of golden tilefish, 1986-2010.

Year	Commercial	Recreational	Total
1986	1,339,354	319	1,339,673
1987	413,546	147	413,693
1988	699,276	3,967	703,243
1989	1,005,085	14	1,005,099
1990	1,007,924	349	1,008,273
1991	1,080,512	390	1,080,902
1992	1,080,482	6,929	1,087,411
1993	1,149,853	0	1,149,853
1994	895,513	12,778	908,291
1995	752,599	0	752,599
1996	374,056	3,499	377,555
1997	404,389	28,986	433,375
1998	405,165	1,238	406,403
1999	565,979	8,137	574,116
2000	805,956	13,789	819,745
2001	438,253	35,179	473,432
2002	396,253	17,598	413,851
2003	247,763	45,419	293,182
2004	288,101	38,348	326,449
2005	305,151	240,240	545,391
2006	451,286	50,743	502,029
2007	336,811	9,538	346,349
2008	350,138	0	350,138
2009	377,986	54,514	432,500
2010	444,108	27,131	471,239

Source: SEDAR 25.

4.1.2 Economic Effects

In general, an ACL alternative, which provides for the largest ACL level, would allow fishing participants to generate the largest economic benefits from a fishery, at least in the short term. This is particularly true in the case of the golden tilefish component of the snapper grouper fishery inasmuch as the current commercial ACL for the species has been consistently exceeded and the commercial fishing season has become shorter. A recreational closure was implemented in 2001 because the recreational ACL was exceeded; there are alternatives in place and in this amendment that would trigger the application of Accountability Measures (AMs) for the recreational sector.

Among the five alternatives, **Alternative 1 (No Action)** would provide for the largest ACL, and thus may be considered best from an economic standpoint. However, this alternative is not a viable alternative as it would result in an ACL larger than the recommended ABC, and does not comply with the Magnuson-Stevens Act. **Alternative 2** may then be considered best in terms of its consequent economic effects, but it should be noted that **Alternatives 3, 4,** and **5** would provide for increases in commercial and recreational ACLs above their current levels. Thus, in principle, all the viable alternatives (**Alternatives 2** through **5**) may be expected to generate positive economic effects on the commercial and recreational sectors. It is also reasonable to expect that the level of positive economic effects on both the commercial and recreational sectors would be larger with higher ACLs.

Not all of the ACL/OY alternatives being considered in this action have the same likelihood of promoting a sustainable fishery over time. In general, the closer ACL=OY=ABC, the smaller the short-term economic impacts, but at the same time the likelihood of the biomass going below B_{MSY} is increased. That is, **Alternative 2** is likely to provide better economic conditions than the other alternatives over the short-term. The decision that needs to be made is one of how much biological risk is reasonable given the level of economic impacts the Council is willing to endure. The regulatory regime adopted over time would play a major role in making long-term economic benefits sustainable over time. The most conservative alternative has a higher likelihood of generating increased, long-term economic value while preserving the sustainability of the fish stock, assuming the fishing mortality rate is allowed to increase should stock conditions warrant it. Optimally, from an economic perspective, allowing fishermen to take all of the ACL, but not exceed it would provide the most economic benefit in the long-term. Regulatory regimes that make the optimal less likely to occur could very well erode the economic benefits over time, even at higher stock levels. Overcapacity is one condition that can make it more difficult to manage landings close to an ACL. Addressing overcapacity through an endorsement system could be an initial step towards adopting a management system that promotes more economic efficiency.

4.1.2.1 Effects on the Commercial Sector

The commercial sector is allocated 97 percent of the ACL, and in recent years the hook-and-line and longline gear groups have fully harvested the commercial allocation. For the current analysis, the economic effects of the various alternatives are quantified by estimating their revenue consequences on the hook-and-line and longline gear groups. Profits would have been a more ideal metric for economic analysis, but information on vessel profits is not available.

For purposes of the revenue analysis, data from 2005-2010 are used to characterize the baseline scenario. This time period captures the more recent commercial activities in the golden tilefish portion of the snapper grouper fishery. All revenue figures are expressed in 2010 dollars. As the

ACL under each alternative is provided over the years 2012-2015, the revenue effects are expressed as net present values.

A total of 142 vessels using hook and line and 38 vessels using longline landed golden tilefish in any one year during 2005-2010. Vessels using hook and line landed an annual average of about 27,000 lb gw of golden tilefish and 220,000 lb gw of other snapper grouper species. Gross revenues of these vessels averaged annually at $76,000 (2010 dollars) from golden tilefish and $567,000 (2010 dollars) from other snapper grouper. For 2005-2010, vessels using longline landed an annual average of about 298,000 lb gw of golden tilefish and 153,000 lb gw of other snapper grouper species. Their revenues for this period averaged annually at $802,000 from golden tilefish and $286,000 from other snapper grouper species. On average, vessels using hook and line depended on other snapper grouper species for a majority of their revenues while vessels using longline depended on golden tilefish as their major source of revenues. Obviously, some vessels using hook and line could be expected to be more dependent on golden tilefish as a major source of revenues. In the same vein, vessels using longline could be more dependent on other snapper grouper species as a major source of revenues. These vessels, using hook and line or longline, are assumed to comprise the universe of commercial vessels directly affected by actions in this regulatory amendment, including the ACL alternatives. It is possible that, with increases in the ACL, other commercial vessels may enter or re-enter the golden tilefish portion of the snapper grouper fishery, but it is not reasonably possible to determine how many vessels would do so.

Estimates of revenue changes, in net present value terms, due to the various ACL alternatives would be different when estimated for different years and using that particular year's fishing characteristics as the baseline. This is illustrated in the four charts of **Figure 4-2** below. Revenues are in thousands of 2010 dollars calculated as net present values of revenue streams over the years 2012-2015 using a 7 percent discount rate. The shape of all four charts is similar, indicating that the relative distribution of each ACL alternative's revenue effects is the same whichever year is used as the baseline year. The revenue effects would be smallest if 2006 were used as the baseline and largest if 2007 were used instead as the baseline. While the charts are not drawn exactly the same, reading off the revenue (vertical) axis reveals that **Alternative 2** would result in the largest revenue effects and **Alternative 4**, the lowest. Moreover, the effects of each ACL alternative on the longline gear group (LL) clearly dominate those on the hook and line group (HL).

For the current purpose of determining the economic effects of the various ACL alternatives, while making use of each year's information, each year's estimates of the revenue effects were averaged and the results are used to represent the expected economic effects. **Table 4-5** presents the expected revenue effects of each ACL alternative. These revenue effects are calculated as changes relative to the baseline revenues, i.e., average annual revenues for 2005-2010. Net present values of revenue changes over the years 2012-2015 are presented using discount rates of 7%, 5%, and 3%.

Alternative 2 would provide the largest increase in revenues to all vessels harvesting golden tilefish, followed by **Alternative 5**, **Alternative 3**, and **Alternative 4**. This ordering is mainly driven by the relative ACL levels associated with each alternative. Longline vessels would receive most of the increases in revenues, because of the dominating presence of this group in the harvest of golden tilefish during the baseline years. The use of discount rates other than 7% would merely change the magnitude but not the direction of revenue effects.

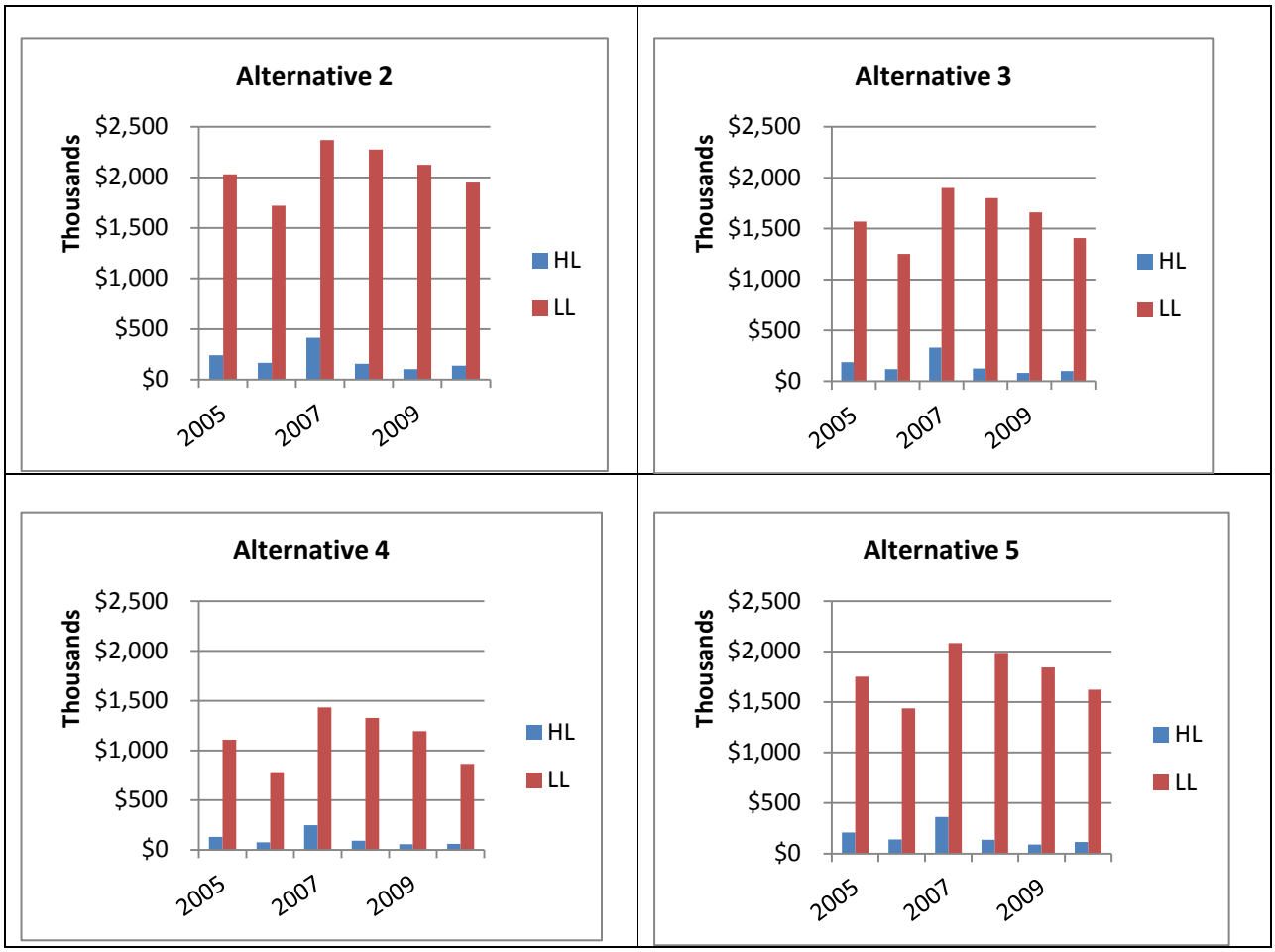


Figure 4-2. Revenue effects of each ACL alternative on hook-and-line (HL) and longline (LL) vessels using different years as the baseline year. Revenues are in thousands of 2010 dollars expressed as net present values over the period 2012-2015.

The difference in the revenue effects of **Alternative 2** from each of the other alternatives would more than double as the ordering of these other alternatives goes down. The effects of **Alternative 2** would be approximately $300,000 higher than those of **Alternative 5**, $500,000 higher than those of **Alternative 3**, and $1,000,000 higher than those of **Alternative 4**.

One major assumption in the estimating the revenue effects of the ACL alternatives is that each ACL alternative would affect only the revenues derived from a vessel's harvest of golden tilefish. Vessel revenues from other snapper grouper species are assumed to remain the same. This is probably an unlikely situation because when vessels harvest more golden tilefish, for example by increasing their fishing time or number of trips, they may also catch other snapper grouper species. But the amount of harvest of other snapper grouper species and their associated revenues cannot be determined.

The extent to which these revenue increases would result in net profit increases cannot be estimated. As long as future fishing effort approximates that of the 2005-2010 condition, it can be expected that the revenue increases due to any of the ACL alternative would trickle down as profit

increases. If, on the other hand, the ACL increases mainly invite more participants into the fishery or more intense effort from existing participants, the fishing season could very well be shortened. This could potentially increase the cost of fishing as well as decrease safety at sea. Moreover, if the current derby-type fishery continues into the future, market gluts could occur which would dampen the price for golden tilefish. In a derby-type fishery, revenue increases would be less than those shown in **Table 4-5,** and possibly profits would also be adversely affected.

Table 4-5. Net present value of revenue increases over 2012-2015 due to each ACL alternative, 2012-2015, in thousands of 2010 dollars.

	Hook and Line	Longline	Total
7% Discount Rate			
Alternative 2	$203	$2,077	$2,281
Alternative 3	$157	$1,598	$1,755
Alternative 4	$111	$1,118	$1,229
Alternative 5	$176	$1,790	$1,966
5% Discount Rate			
Alternative 2	$213	$2,174	$2,387
Alternative 3	$165	$1,672	$1,837
Alternative 4	$117	$1,170	$1,286
Alternative 5	$184	$1,874	$2,058
3% Discount Rate			
Alternative 2	$223	$2,278	$2,501
Alternative 3	$173	$1,752	$1,924
Alternative 4	$122	$1,226	$1,348
Alternative 5	$193	$1,964	$2,157

4.1.2.2 Effects on the Recreational Sector

The recreational sector is a relatively small component of the golden tilefish portion of the snapper grouper fishery. This sector is allocated 3 percent of the total golden tilefish ACL. The current recreational ACL is 1,578 fish, or 9,799 lb ww using conversion rate of 6.21. Recreational harvest has far exceeded its ACL, particularly in more recent years. In 2010 and 2011, recreational harvests of golden tilefish were approximately 27,000 lb ww and 52,000 lb ww, respectively. These harvest levels are comparable to the harvest levels of the hook and line segment of the commercial sector. The current AM for the recreational sector is a post-season AM that would shorten the

following fishing year's season by the amount necessary to ensure the following year's ACL is not exceeded. To date, this has not been imposed on the sector, but there are alternatives in this amendment (Action 3) that could revise this current AM.

Assessment of the economic implications of the ACL alternatives is conducted by estimating the changes in consumer surplus (CS) to recreational anglers. CS is the net benefit an angler derives from an additional fish kept on a fishing trip and is equivalent to the difference between the monetized benefit an angler receives and the actual cost. This value is an appropriate measure of economic effects on recreational anglers as a result of changes in fishing regulations. The relatively sparse number of target trips for golden tilefish by anglers fishing through the for-hire vessels precluded the estimation of effects on the net operating revenues (NOR) of for-hire vessels. The methodology employed in this assessment follows that used in previous amendments to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (Comprehensive ACL Amendment, Amendment 17A, Amendment 17b, Amendment 18a, and Amendment 24) on the recreational sector. Detailed discussions of the methodology and its limitations may be found in those amendments and are incorporated herein by reference.

Similar to the analysis done for the commercial sector, the historical fishery performance in 2005-2010 is considered to define the no action or baseline alternative. For this period, recreational harvests averaged at 63,694 lb ww, or 10,257 fish. The CS value used is $26.52 per fish in 2010 dollars, and is based on the recent estimates of willingness to pay (CS) for snapper grouper species in the Southeast (Carter and Liese 2011). This CS value is assumed constant across fishing platforms, geographical areas, and levels of harvest. This may not necessarily be the case. Headboat anglers may value some snapper-grouper species differently, on average, than private and charterboat anglers. The direction and magnitude of such difference are unknown, though the higher cost of fishing to charterboat anglers suggests the CS to headboat anglers would be less than that to charterboat anglers. In the absence of relevant information, no adjustment is made for possible CS differences among anglers fishing through different platforms. For the same reason, no adjustments are made to possible CS differences across geographic areas or over various harvest levels.

Estimates of the net present value of CS changes over 2012-2015, expressed in 2010 dollars, are presented in **Table 4-6**. The tabulated results assume that recreational harvests cease once the sector ACL is reached. This could happen with an in-season AM in the form of fishery closure. Because of substantial harvests during 2005-2010, which serve as the baseline harvests, ACL increases under any of the ACL alternatives would be less than those in the baseline. Hence, the results shown in **Table 4-6** are negative CS changes under any ACL alternative. The least CS reduction would be associated with **Alternative 2**, followed by **Alternative 5**, **Alternative 3**, and **Alternative 4**. The use of different discounting rates would not change the ordering of alternatives in terms of CS effects. Lower discount rates would simply result in larger CS reductions. It may be noted that these results would likely be overestimates since anglers can adapt to regulations, such for example as shifting their effort to other species or the same species during the open season.

The negative effects of ACL increases under any of the ACL alternatives would seem odd, but as noted earlier this is because of large recreational harvests during the baseline years. To provide a different perspective, two scenarios are developed. Scenario 1 uses the current recreational ACL of 1,578 fish as the baseline harvest and ACL values under each ACL alternative for 2012-2015. Scenario 2 uses the same baseline as before (2005-2010 recreational harvest) but maintains the

current ACL of 1,578 fish over the years 2012-2015. In effect, Scenario 2 would have the same ACL under all ACL alternatives. Estimates of CS changes under these two scenarios are presented in **Table 4-7**.

Scenario 1 shows CS increases under all ACL alternatives because each alternative would provide for harvest levels above the current ACL (see **Table 4-7**). Using the current recreational ACL as the baseline means that, in effect, the average harvests in 2005-2010 were constrained to the current ACL. Had it been the actual case, the recreational sector would have forgone some of the CS values realized in 2005-2010, and those forgone CS values could be larger or smaller than the CS gains during 2012-2015. In any case, Scenario 1 illustrates a trade-off between short-term losses and long-term gains, an opposite situation displayed in **Table 4-6**.

Scenario 2 shows CS reductions under all ACL alternatives because the baseline harvest exceeded the ACL which is kept constant in 2012-2015 (see **Table 4-7**). This scenario illustrates the case where the ACL is kept constant at its current level and an in-season AM particularly in the form of a fishery closure is effectively implemented. The negative values under this scenario are higher than those shown in **Table 4-6**.

Table 4-6. Net present value of consumer surplus reductions over 2012-2015 due to each ACL alternative, in thousands of 2010 dollars.

	Discount Rate		
	7%	**5%**	**3%**
Alternative 2	($633)	($663)	($695)
Alternative 3	($662)	($693)	($726)
Alternative 4	($691)	($723)	($758)
Alternative 5	($650)	($681)	($713)

Parentheses indicate negative numbers.

Table 4-7. Net present value of consumer surplus changes over 2012-2015 due to each ACL alternative, in thousands of 2010 dollars.

	Scenario 1			**Scenario 2**		
	Discount Rate			**Discount Rate**		
	7%	**5%**	**3%**	**7%**	**5%**	**3%**
Alt. 2	$147	$154	$161	($780)	($816)	($856)
Alt. 3	$118	$123	$129	($780)	($816)	($856)
Alt. 4	$89	$93	$98	($780)	($816)	($856)
Alt. 5	$129	$136	$142	($780)	($816)	($856)

Parentheses indicate negative numbers.

4.1.3 Social Effects

Although an administrative action, defining the OY for a species establishes a management target for allowable harvests. If defined as a percentage (less than 100%) of the MSY, the target would incorporate a protective buffer to help ensure the biological health of the resource is not threatened, thereby helping support stable environmental, economic, and social benefit streams. The larger the buffer, the greater the certainty of biological protection. However, an excessively large buffer (i.e., a buffer that exceeds the biological variability of the resource, environmental challenges, and potential for fishery-induced problems) would result in overly restrictive harvest allowances, leading to foregone social benefits. While none of the relevant biological parameters are ever likely known with certainty, the best OY specification would be expected to balance the risk and costs of being insufficiently conservative against the costs of potentially unnecessarily "leaving fish in the water", all decisions on which incorporate best available knowledge of the biology of the resource, environmental challenges, and the harvest capabilities of the fishing sectors. **Alternatives 2-5** would set the OY equal to the ACL, which establishes a buffer between the ACL/OY and the MSY/OFL level and could result in underutilized resource. Concerning the ACL, in general the higher the ACL, the greater the short-term social and economic benefits that would be expected to accrue, assuming long-term recovery and rebuilding goals are met. Preventing overfishing is assumed to result in net long-term positive social benefits. **Alternative 2** sets the ACL equal to the ABC, the highest possible ACL, and would result in fewer short-term social impacts than under **Alternatives 3** and **4**, which each set the ACL at a percentage of the ABC and **Alternative 5** that sets the ACL equal to the long-term yield.

4.1.4 Administrative Effects

Modifying sector ACLs and OY for golden tilefish would not have direct impacts on the administrative environment. ACLs are already in place for golden tilefish and commercial and recreational closures have taken place in the past. In general, the lower the ACL is set the more likely it is to be met or exceeded, and the more likely an AM would be triggered, and therefore would have the greatest administrative impact. **Alternative 2** would identify the highest sector ACLs for golden tilefish. Therefore, greater harvest would be allowed before an AM is triggered. **Alternatives 3** through **5** would implement lower sector ACLs than **Alternative 2** and are therefore more likely to be met or exceeded than ACLs specified under **Alternative 2**. In the long-term, taking action to prevent an ACL overage or correcting for an ACL overage, could be administratively beneficial if those actions prevent the stock from reaching an overfished condition that would trigger development of a rebuilding plan.

4.2 Action 2. Establish an Annual Catch Target (ACT) for the Golden Tilefish Commercial Sector

Alternative 1 (No Action). No commercial Annual Catch Target (ACT) currently exists for golden tilefish.

Alternative 2. Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector = 90% of the commercial sector ACL.

Alternative 3. Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector = 75% of the commercial sector ACL.

Alternative 4. Establish an Annual Catch Target (ACT) for the golden tilefish commercial sector = 50% of the commercial sector ACL.

Discussion

The Council's intent is that if the commercial ACT is met, or projected to be met, the commercial fishery would be closed; harvest and possession would be limited to the bag limit and no sale would be allowed. There are no Accountability Measures (AMs) in place that would require landings over the ACL to be deducted from the following year or that would provide for any underage of the ACL to be added the following year.

Commercial quotas and trip/bag limits were implemented in 1994. Reductions in the quota beginning in 2006 resulted in commercial and recreational closures:

- Amendment 6 (SAFMC 1993) was implemented effective June 27, 1994
    - Commercial quota – 1,475,795 pounds gutted weight (gw) January – December 1994; 1,238,818 pounds gw January – December 1995; and 1,001,663 pounds gw January 1, 1996 onwards each year until modified.
    - Commercial trip limits (effective June 6, 1994) – 5,000 pounds gw until quota met and then 300 pounds gw
    - Recreational bag & possession limit – groupers (excluding Goliath grouper and Nassau grouper, and all species of tilefish combined = 5
- Amendment 13C (SAFMC 2006) was implemented effective 10/23/06

Commercial quota (F_{MSY}) = 295,000 lb gw (331,000 lb ww)

- Amendment 15B (SAFMC 2008b) was implemented effective 2/15/10
    - MSY equals the yield produced by F_{MSY} (0.043) = 336,425 lbs whole weight. MSY and F_{MSY} are defined by the most recent SEDAR.
    - OY equals the yield produced by F_{OY}. Note: If a stock is overfished, F_{OY} equals the fishing mortality rate specified by the rebuilding plan designed to rebuild the stock to SSB_{MSY} within the approved schedule. After the stock is rebuilt, F_{OY} = a fraction of F_{MSY}. Golden tilefish is not overfished. F_{OY} =75%F_{MSY}. OY = 326,554 lbs whole weight
    - MSST equals SSB_{MSY}(0.75) = 1,454,063 lbs whole weight

- Amendment 17B (SAFMC 2010b) was implemented effective 1/31/11
    - Total ACL (FOY) = 326,554 pounds ww or 291,566 pounds gw
    - Commercial ACL = 282,819 pounds gw
    - Recreational ACL = 8,747 pounds gw = 1,578 fish
- Commercial closures
    - October 23, 2006
    - October 3, 2007
    - August 17, 2008
    - July 15, 2009
    - April 12, 2010
    - March 9, 2011
    - February 17, 2012
- Recreational closures
    - October 6, 2011

4.2.1 Biological Effects

Under **Alternative 1 (No Action)** there is no commercial ACT for golden tilefish currently in place to help ensure overfishing does not occur. In situations where the commercial sector landings are closely tracked in-season through a quota monitoring system, and projections can be made to close golden tilefish before the ACL is exceeded, a commercial ACT is not needed. However, commercial landings exceeded the commercial sector quota/ACL every year since 2006 when the quota was reduced from 1 million pounds (**Table 4-8**). An ACT used as a benchmark for triggering AM applications would act like an ACL and thus would, at best, have the same short-term effects on fishing participants as an ACL.

The percent overage for the commercial sector was 26% in 2011 based on preliminary landings; final numbers available in mid-2012 are likely to be higher. The commercial overage ranged from a low of 2% in 2007 to a high of 36% in 2006. The South Atlantic and Gulf of Mexico Fishery Management Councils are developing a generic dealer reporting amendment to provide more timely and accurate data reporting to reduce the incidence of quota overages. The target implementation date is January 1, 2013. The recreational overage was 533% in 2011, the first year implemented. The ABC recommended by the South Atlantic Council's SSC, based on the South Atlantic Council/SSC ABC Control Rule, results in the establishment of a large buffer between the OFL and ABC (average = 531,250 pounds ww). Therefore, overfishing would occur only if landings exceeded the ABC by about 44% (based on average 2012-2015 data), slightly more than the overages in 2006 (36%) and 2010 (34%).

Table 4-8. Golden tilefish quota overages (pounds whole weight).

	Commercial	Commercial	Commercial	Commercial	Recreational	Recreational	Recreational	Recreational
Year	Quota/ACL	Landings	Overage	% Over	Quota/ACL	Landings	Overage	% Over
2006	331,000	451,286	120,286	36%				
2007	331,000	336,811	5,811	2%				
2008	331,000	350,138	19,138	6%				
2009	331,000	377,986	46,986	14%				
2010	331,000	444,108	113,108	34%				
2011	316,757	399,664	82,907	26%	9,799	62,007	52,208	533%
2012	316,757							

Source: Data for 2006-2010 from SEDAR 25. Preliminary landings for 2011 from SEFSC projection analyses (Appendix G).

Setting a commercial ACT between 90% and 50% of the ACL (**Alternatives 2-4**), and closing golden tilefish when the ACT value is reached would provide greater assurance overfishing would not occur and AMs would not be triggered. Establishing an ACT that is 50% of the ACL (**Alternative 4**) would be the most conservative ACT among the alternatives considered. Examination of the values in **Table 4-9** reveals that **Alternative 4** would provide a commercial ACT that is similar to the current quota (282,819 pounds gw; 316,757 pounds ww). Therefore, under **Alternative 4**, shortened fishing seasons would be expected to continue to occur for golden tilefish; although, endorsement actions being considered in Amendment 18B to the Snapper Grouper FMP are expected to prolong the fishing season and lessen derby-like conditions to some extent.

The lower the ACT, the greater the biological benefit for golden tilefish. Therefore, **Alternative 4** would also be expected to have the greatest beneficial impact for the golden tilefish stock among **Alternatives 2-4** and **Alternative 1 (No Action)** would be expected to have the least amount of positive biological effects.

Establishing a commercial ACT is not expected to negatively affect any species listed under the Endangered Species Act. Because the ACT alternatives would be used as management reference points rather than actionable limits on fishing, no biological benefit on endangered or threatened species or the habitats thereof are expected from this action.

Table 4-9. Values for Commercial ACT based on alternatives in Action 1 and alternatives in Action 2.

Alternative 2 (Action 1)				
Year	ACL	90% (Alt 2)	75% (Alt 3)	50% (Alt 4)
2012	647,960	583,164	485,970	323,980
2013	648,930	584,037	486,698	324,465
2014	646,020	581,418	484,515	323,010
2015	635,350	571,815	476,513	317,675
Average	644,565	580,109	483,424	322,283
Alternative 3 (Action 1)				
Year	ACL	90% (Alt 2)	75% (Alt 3)	50% (Alt 4)
2012	583,164	524,848	437,373	291,582
2013	584,037	525,633	438,028	292,019
2014	581,418	523,276	436,064	290,709
2015	571,815	514,634	428,861	285,908
Average	580,109	522,098	435,081	290,054
Alternative 4 (Action 1)				
Year	ACL	90% (Alt 2)	75% (Alt 3)	50% (Alt 4)
2012	518,368	466,531	388,776	259,184
2013	519,144	467,230	389,358	259,572
2014	516,816	465,134	387,612	258,408
2015	508,280	457,452	381,210	254,140
Average	515,652	464,087	386,739	257,826
Alternative 5 (Action 1)				
Year	ACL	90% (Alt 2)	75% (Alt 3)	50% (Alt 4)
2012-15	606,250	545,625	454,688	303,125

4.2.2 Economic Effects

An ACT would have no direct economic effects on the commercial sector if it is solely used as a monitoring tool. If used as a benchmark for triggering AM applications, an ACT would act like an ACL and thus would, at best, have the same short-term effects on fishing participants as an ACL. In such a situation, an ACT that is close or equal to the ACL would provide the best economic scenario for commercial fishermen. **Alternative 1** is closest to this because by not adopting an ACT, the ACL would take over as a benchmark for AM applications. Among the other ACT alternatives, **Alternative 2** would be best from the perspective of short-term effects on the commercial sector, followed by **Alternative 3**, and **Alternative 4**.

If an ACT were used to trigger an AM, like a fishing season closure, its effects can be estimated in the same way as was done earlier for an ACL. **Table 4-10** presents the revenue effects of each ACT alternative using the same baseline data as in the ACL analysis. Each ACT alternative is analyzed given an ACL alternative since the ACT is defined as some percentage of an ACL.

The positive revenue effects of any ACL alternative under Action 1 would be preserved under **Alternatives 2** and **3** for an ACT, albeit at lower levels. The effects would turn negative under **Alternative 4**, indicating this alternative would tend to erase all potential benefit increases to the commercial sector from ACL increases.

As with the ACL case, the extent to which these revenue increases under **Alternatives 2** and **3** would result in net profit increases cannot be estimated. The revenue reductions under **Alternative 4** would likely result in profit reductions to the commercial sector. As noted in an earlier discussion of the economic effects of ACLs, it can be expected that the revenue increases due to any of the ACL alternative would trickle down as profit increases as long as future fishing effort approximates that of the 2005-2010 condition. This may also be true with the revenue increases under **Alternatives 2** and **3** for an ACT, but the likelihood of a profit increase under these two ACT alternatives would be lower than that for the corresponding ACL alternative. A different scenario would result if such revenue increases mainly invite more participants into the fishery or more intense effort from existing participants. The fishing season could very well be shortened, likely increasing the cost of fishing as well as decreasing safety at sea. Moreover, if the current derby-type fishery continues into the future, market gluts could occur which would dampen the price for golden tilefish. In a derby-type fishery, revenue increases would be less than those shown in **Table 4-10,** and it would become more likely for profits to be adversely affected.

Table 4-10. Net present value of revenue changes over 2012-2015 due to each ACT alternative, in thousands of 2010 dollars.

ACL→	Alt. 2 for ACL			Alt. 3 for ACL			Alt. 4 for ACL			Alt. 5 for ACL		
ACT↓	HL	LL	SUM	HL	LL	SUM	HL	LL	SUM	HL	LL	SUM
7% Discount Rate												
90%	$157	$1,598	$1,755	$116	$1,166	$1,282	$75	$734	$809	$133	$1,339	$1,472
75%	$88	$878	$967	$54	$519	$573	$20	$159	$178	$68	$663	$730
50%	($26)	($321)	($347)	($49)	($560)	($610)	($72)	($800)	($873)	($40)	($464)	($505)
5% Discount Rate												
90%	$165	$1,672	$1,837	$121	$1,220	$1,341	$78	$768	$846	$139	$1,402	$1,540
75%	$93	$919	$1,011	$57	$542	$599	$20	$166	$186	$71	$694	$765
50%	($28)	($336)	($364)	($52)	($587)	($639)	($76)	($838)	($914)	($42)	($486)	($528)
3% Discount Rate												
90%	$173	$1,752	$1,924	$127	$1,278	$1,406	$82	$805	$887	$146	$1,469	$1,615
75%	$97	$963	$1,060	$59	$568	$627	$21	$173	$195	$74	$727	$802
50%	($29)	($353)	($382)	($54)	($616)	($670)	($79)	($879)	($958)	($44)	($510)	($554)

Parentheses indicate negative numbers.

4.2.3 Social Effects

Setting ACTs usually entails a further reduction in harvest levels to ensure catch remains at or below the ACL and does not wildly fluctuate. For species where information is scarce and management is uncertain, it becomes a real possibility that there can be negative short-term impacts that may not have been necessary if thresholds are too restrictive. In other species, which have more certainty in management and monitoring of catch, a more precise harvest level can be set with certainty and reduce volatility in the fishery. Additionally, if the ACT is associated with the AMs, it can lead to significant impacts on the social environment if the AMs include restrictions or closures.

Under **Alternative 1 (No Action)** there would not be a buffer through the ACT that is less restrictive than **Alternatives 2-4**. With **Alternatives 2-4,** the buffer would reduce the harvest threshold further from the ACL. Therefore, among **Alternatives 2-4**, **Alternative 2** would be expected to have the most positive social effects and **Alternative 4** would be expected to have the greatest negative social effects. Some of those effects are similar to other thresholds being met and may involve switching to other species or discontinuing fishing altogether. Although these are common responses to closures, it is not known how fishermen may respond if closures are anticipated for several different species or groups. There could be a domino effect as one closure forces them to switch to another species, which closes as thresholds are met with the added fishing pressure.

4.2.4 Administrative Effects

Under **Alternative 1 (No Action)** there is no ACT currently in place for the commercial sector. Establishing an ACT for the commercial sector as proposed under **Alternatives 2-4**, would result in an increased administrative burden beyond the status quo, since additional reference points would need to be monitored.

4.3 Action 3. Revise Recreational Accountability Measures (AMs) for Golden Tilefish

Alternative 1 (No Action). Do not revise current recreational AMs for golden tilefish.

If the recreational ACL is exceeded, the Regional Administrator (RA) shall publish a notice to reduce the length of the following recreational fishing season by the amount necessary to ensure landings do not exceed the recreational sector ACL for the following fishing season. Compare the recreational ACL with projected recreational landings over a range of years. For 2010, use only 2010 landings. For 2011, use the average landings of 2010 and 2011. For 2012 and beyond, use the most recent three-year running average.

Alternative 2. Specify the recreational in-season AM trigger.

Sub-alternative 2a. Do not specify an AM trigger.

Sub-alternative 2b (Preferred). If the annual landings exceed the ACL in a given year.

Alternative 3. Specify the recreational in-season AM.

Sub-alternative 3a. Do not specify an in-season AM.

Sub-alternative 3b (Preferred). The Regional Administrator (RA) shall publish a notice to close the recreational sector when the ACL is projected to be met.

Alternative 4. Specify the recreational post-season AM.

Sub-alternative 4a (Preferred). Monitor following year and shorten season as necessary. If the ACL is exceeded, the following year's recreational landings would be monitored in-season for persistence in increased landings. The Regional Administrator (RA) will publish a notice to reduce the length of the recreational fishing season as necessary.

Sub-alternative 4b. Payback. If the recreational ACL is exceeded, and golden tilefish are overfished, the Regional Administrator (RA) shall publish a notice to reduce the recreational ACL in the following season by the amount of the overage.

Discussion

Amendment 17B to the Snapper Grouper FMP (Amendment 17B) (SAFMC 2010b) implemented commercial and recreational AMs for golden tilefish. Subsequent to the implementation of Amendment 17B, the South Atlantic Council determined the methodology employed by the system of recreational AMs under Amendment 17B may not be the most appropriate way to constrain harvest at or below the recreational ACL and it could unnecessarily penalize recreational participants in the golden tilefish component of the snapper grouper fishery. Therefore, at their December 2011 meeting, the South Atlantic Council requested that AMs for golden tilefish be re-examined to incorporate more flexibility as is appropriate for this component of the snapper grouper fishery. This action was included in Amendment 18B.

4.3.1 Biological Effects

The recreational golden tilefish AMs outlined in Amendment 17B employed the use of a three-year running average. Using a three-year running average of recreational landings to determine if the recreational ACL has been exceeded in any given year is not likely to be the most appropriate means of determining such overages. As Amendment 17B states, the three-year running average was intended to account for variability in the recreational data collection and associated data uncertainty. However, exceptionally high recreational landings in a single year could significantly influence the running average for several years into the future in addition to reducing the ACL in the season following an overage. Therefore, using the three-year running average has the potential to penalize the recreational sector once when the ACL is met or is projected to be met and in subsequent years when the average value is calculated. This situation could result in the possible triggering of unnecessary AMs creating unintended socioeconomic consequences and lowered ACLs that are not biologically needed. Because of the issues presented by the use of a three-year average, the South Atlantic Council proposed new AM alternatives that do not include this method. Since this action would only change the methods used to determine if AMs are required, and does not establish immediate harvest objectives, it would not directly affect the ecological environment or protected species.

Alternative 1 (No Action) would not change the current system of AMs to employ more appropriate methods for determining recreational ACL overages and modify the corrective actions taken if the ACL is projected to be met or is exceeded. **Alternative 2** specifies the trigger for recreational AMs. Under **Preferred Sub-alternative 2b**, AMs would be triggered when the current year's recreational landings exceeded the recreational ACL. To prevent the recreational ACL from being exceeded, **Preferred Sub-alternative 3b** would allow the Regional Administrator (RA)to close recreational fishing for golden tilefish when the recreational ACL was projected to be met. In-season monitoring of recreational landings is difficult, however. Currently, private recreational data become available 45 days after the end of a two-month wave and the headboat data are keypunched and analyzed as resources allow. There would likely be some uncertainty associated with imposing in-season AMs for the recreational sector making post-season AMs more appropriate. **Alternative 4** addresses post-season AMs under two scenarios: when the stock is not overfished nor undergoing overfishing (**Preferred Sub-alternative 4a**) and when the stock has been declared overfished (**Sub-alternative 4b**). **Preferred Sub-alternative 4a** would ensure that the amount of the previous year's ACL overage would be accounted for in the subsequent year via a shortened season, and thus would be biologically beneficial.

4.3.2 Economic Effects

Accountability measures (AMs) would have direct economic effects on the recreational sector, because they would affect the allowed harvest or fishing opportunities for golden tilefish. These economic effects would generally be immediate with in-season AMs and would be delayed if only post-season AMs were implemented. The no action alternative (**Alternative 1**) provides for only a post-season AM which would be triggered if, starting in 2012 and thereafter, the average harvest over three years exceeded the sector's ACL in the current year. Considering the relatively high recreational landings of golden tilefish in the most recent years, the averaging method would tend to result in relatively high landings that could trigger an AM application even if the ACL in the current

year were not exceeded. If the recreational sector's ACL remained unchanged, the near-term expectations under **Alternative 1 (No Action)** would be an increasing level of losses in consumer surplus to recreational anglers and profits to the for-hire sector. As the recreational sector's ACL is increased over time, gains in angler consumer surplus and for-hire sector profit would be delayed for a number of years.

Of the two sub-alternatives under **Alternative 2** on the trigger for recreational AMs, **Sub-alternative 2a** may be taken not to effect any application of AMs, and this would prevent short-term losses in the recreational sector due to regulatory measures. In contrast, **Sub-alternative 2b (Preferred)** would provide for an AM trigger that could immediately or eventually result in adverse economic effects on the recreational sector. The long-term economic effects of these two sub-alternatives would depend on whether the magnitude of overages in the recreational sector would rise to a level that would prompt future stricter regulations. If stricter regulations were needed in the future due to overages, **Sub-alternative 2a** would have negative long-term economic effects and **Sub-alternative 2b**, positive long-term economic effects.

Sub-alternative 3a would be similar to **Alternative 1**, and thus would not bring about any changes to current and future economic conditions in the recreational sector. **Sub-alternative 3b (Preferred**) provides for an in-season AM that would close the recreational sector when its ACL is reached. Relative to the no action alternative, this sub-alternative would result in short-term losses in consumer surplus to anglers and profits to the for-hire sector because recreational fishing opportunities in the current year would be curtailed.

Sub-alternative 4a has different economic implications than **Alternative 1** to the extent that, in triggering an AM, the recreational ACL would no longer be compared with the average landing in the three most recent years. Considering the relatively high recreational landings of golden tilefish in the most recent years, the averaging method would tend to result in relatively high landings that could trigger an AM application even if the ACL were not exceeded in the current year. In the short-term, **Sub-alternative 4a** would result in potentially less adverse economic effects than the no action alternative. **Sub-alternative 4b**, which applies if the stock is overfished, provides for a post-season payback for overages in the prior year, and thus in principle may be expected to reduce angler consumer surplus and for-hire profits. However, this sub-alternative would not have immediate effects on the recreational sector because the most recent stock assessment indicates golden tilefish is not overfished. In the addition, the South Atlantic Council decided not to implement a post-season ACL payback when new projections, as in the present case, are adopted that incorporate ACL overages and the ACLs are adjusted based on those projections. Relative to the no action alternative, **Sub-alternative 4b** would benefit the recreational sector, because it would eliminate the applications of post-season AMs so long as the stock is not overfished.

4.3.3 Social Effects

The setting of AMs can have significant direct and indirect effects on the social environment as they usually impose some restriction on harvest, during either the current season or subsequent seasons. The long-term effects should be beneficial as they provide protection from further negative impacts on the stock. 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.

Alternative 1 (No Action) would implement no additional management measures and there would be no additional social impact on the recreational fishery. The trigger defined in **Alternative 2** is primarily administrative and social effects would be generated by the associated AMs that are triggered. As with any early closure due to reaching an ACL, **Alternative 3b** (**Preferred)** could result in impacts on recreational anglers and for-hire operations that depend on access to golden tilefish. However, this in-season accountability measure would provide some protection from continued overages and from the required payback in **Alternative 4b**. The in-season and post-season AMs should provide sufficient protection for golden tilefish stock and the long-term benefits of stock protection should contribute to continued participation in the recreational golden tilefish fishery.

4.3.4 Administrative Effects

Alternative 1 (No Action) is likely to be the most administratively burdensome alternative because it would require ongoing calculations of the three-year average of recreational landings. However, the time associated with averaging the most recent recreational landings over three years is not considered an overly burdensome administrative task. In-season AMs **(Alternative 3)** for the recreational sector are the most administratively difficult to implement in a timely manner because of the time when the recreational landings are reported and are ready for use by fishery managers. In-season recreational AMs for golden tilefish would rely heavily on projections of when the ACL would be met during the fishing season, which would be associated with a high degree of uncertainty. The level of uncertainty attached to those in-season projections could result in the recreational sector being closed before it is necessary or being left open too long into the fishing season. For this reason, it is advantageous to not only rely on in-season AMs but also implement post-season AMs that would be triggered if the ACL is exceeded. The latter are addressed under **Alternative 4**. **Preferred Sub-alternative 4a** would require monitoring landings in the year following a sector overage, in order to detect whether or not the increased landings are persistent or an anomaly. Because recreational landings would need to be tracked regardless of what post-season AM alternatives are chosen there is not likely to be a significant difference in administrative impacts among the sub-alternatives under consideration.

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

5.1 Action 1. Revise Annual Catch Limit (ACL and Optimum Yield (OY) for Golden Tilefish

5.2 Action 2. Establish an Annual Catch Target (ACT) for the Golden Tilefish Commercial Sector

5.3 Action 3. Revise Recreational Accountability Measures (AMs) for Golden Tilefish

Council staff will add Council conclusions after the March Council meeting.

Chapter 6. Cumulative Effects

6.1 Biological

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

The Council on Environmental Quality (CEQ) cumulative effects guidance states that this step is done through three activities. The three activities and the location in the document are as follows:

I. The direct and indirect effects of the proposed actions **(Chapter 4.0)**;
II. Which resources, ecosystems, and human communities are affected **(Chapter 3.0)**; and
III. Which effects are important from a cumulative effects perspective **(information revealed in this Cumulative Effects Analysis (CEA)**?

2. Establish the geographic scope of the analysis.

The immediate impact area would be the federal 200-mile limit of the Atlantic off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West, which is also the South Atlantic Council's area of jurisdiction. The extent of boundaries also would depend upon the degree of fish immigration/emigration and larval transport, whichever has the greatest geographical range. More detail is provided in Chapter 3 of this document.

3. Establish the timeframe for the analysis.

Establishing a timeframe for the CEA is important when the past, present, and reasonably foreseeable future actions are discussed. It would be advantageous to go back to a time when there was a natural, or some modified (but ecologically sustainable) condition. However, data collection for many fisheries began when species were already fully exploited. Therefore, the timeframe for analyses should be initiated when data collection began for the various fisheries. In determining how far into the future to analyze cumulative effects, the length of the effects will depend on the species and the alternatives chosen.

4. Identify the other actions affecting the resources, ecosystems, and human communities of concern (the cumulative effects to the human communities are discussed in Section 4).

Listed are other past, present, and reasonably foreseeable actions occurring in the South Atlantic region. These actions, when added to the proposed management measures, may result in cumulative effects on the biophysical environment.

I. Fishery-related actions affecting golden tilefish.

A. Past

The reader is referred to **Appendix X**(History of Management) of this document for past regulatory activity for snapper grouper species, including golden tilefish. These include bag and size limits, spawning season closures, commercial quotas, gear prohibitions and limitations, area closures, and a commercial limited access system.

Amendment 13C to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) (SAFMC 2006) addressed overfishing of golden tilefish and implemented several management measures to limit harvest of the species in commercial and recreational sectors. Amendment 13C to the Snapper Grouper FMP (Amendment 13C) reduced the annual commercial golden tilefish quota from 1,001,663 pounds gutted weight (gw) (1,121,863 pounds whole weight (ww)) to 295,000 pounds gw (331,000 pounds ww). After the commercial quota is met, all purchase and sale is prohibited and harvest and/or possession is limited to the bag limit. Amendment 13C also specified a commercial trip limit of 4,000 pounds gutted weight (4,480 pounds whole weight) until 75% of the quota is taken when the trip limit is reduced to 300 pounds (335 pounds gw). No adjustment would be made to the trip limit if 75% of the quota is attained after September 1. Amendment 13C also limited the possession of golden tilefish to one per person per day within the 5-grouper per person per day aggregate recreational bag limit.

Amendment 15B to the Snapper Grouper FMP (Amendment 15B; SAFMC 2008b) became effective on December 16, 2009. Management measures in Amendment 15B include a prohibition of the sale of bag limit caught snapper grouper species for fishermen not holding a federal commercial permit for South Atlantic snapper grouper, an action to adopt, when implemented, the Atlantic Coastal Cooperative Statistics Program Release, Discard and Protected Species Module to assess and monitor bycatch, allocations for snowy grouper, and management reference points for golden tilefish. Biological benefits from Amendment 15B are not expected to result in a significant cumulative biological effect when added to anticipated biological impacts under this amendment.

Amendment 17B to the Snapper Grouper FMP (Amendment 17B; SAFMC 2010b), which was implemented on January 31, 2011, established annual catch limits (ACLs), annual catch targets, and accountability measures (AMs) for 8 species experiencing overfishing including golden tilefish; modified management measures to limit total mortality to the ACL; and updated the framework procedure for specification of total allowable catch. Amendment 17B established a commercial ACL for golden tilefish of 282,819 pounds gw, and a recreational ACL of 1,578 fish. Amendment 17B also prohibited the harvest and possession of deepwater snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) at depths greater than 240 feet. The intent of this measure was to reduce bycatch of speckled hind and warsaw grouper.

B. Present

In addition to snapper grouper fishery management issues being addressed in this amendment, several other snapper grouper amendments have been developed concurrently and are in the process of approval and implementation.

Amendment 18A to the Snapper Grouper FMP (SAFMC 2011f) contains measures to limit participation and effort in the black sea bass fishery, reduce bycatch in the black sea bass pot fishery, changes to the rebuilding strategy, and other necessary changes to the management of black sea bass as a result of the recent stock assessment. In addition, Amendment 18A includes alternatives to improve data collection. The South Atlantic Council approved Amendment 18A in December 2011.

Regulatory Amendment 11 to the Snapper Grouper FMP (Regulatory Amendment 11; SAFMC 2011a) was approved by the South Atlantic Council at their August 9, 2011, meeting. If approved by the Secretary of Commerce, Regulatory Amendment 11 would remove the current deepwater closure beyond 240 ft for six deepwater snapper grouper species.

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

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

Amendment 24 to the Snapper Grouper FMP (Amendment 24; SAFMC 2011d) considers a rebuilding plan for red grouper, which is overfished and undergoing overfishing. The South Atlantic Council approved Amendment 24 in December 2011.

C. Reasonably Foreseeable Future

Amendment 18B to the Snapper Grouper FMP (Amendment 18B; SAFMC under development) considers establishment of an endorsement program for the golden tilefish commercial sector. Amendment 18B also includes actions to modify the golden tilefish fishing year, modify existing trip limits and specify new ones, and allocate the commercial ACL to longline and hook and line sectors.

Amendment 20B to the Snapper Grouper FMP (Amendment 20B; SAFMC under development) includes a formal review of the current wreckfish ITQ program, and would update/modify that program according to recommendations gleaned from the review. Amendment 20B would also update the wreckfish ITQ program to comply with Reauthorized Magnuson-Stevens Fishery Conservation and Management Act requirements.

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

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

The snapper grouper ecosystem includes many species, which occupy the same habitat at the same time. For example, black sea bass co-occur with vermilion snapper, tomtate, scup, red porgy, white grunt, red snapper, red grouper, scamp, gag, and others. Therefore, many snapper grouper species are likely to be caught and suffer some mortality when regulated since they will be incidentally caught when fishermen target other co-occurring species. In contrast, golden tilefish prefer a mud habitat and can be targeted without significant bycatch from other snapper grouper species. Other natural events such as spawning seasons, and aggregations of fish in spawning condition can make some species especially vulnerable to targeted fishing pressure.

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

The BP/Deepwater Horizon oil spill event, which occurred in the Gulf of Mexico on April 20, 2010, is not expected to impact fisheries operating the South Atlantic. Oil from the spill

site has not been detected in the South Atlantic region, and is not likely to pose a threat to the South Atlantic golden tilefish.

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

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

The species most likely to be impacted by actions in Regulatory Amendment 12 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 12) is golden tilefish, *Lopholatilus chamaeleonticeps*. Trends in the condition of golden tilefish are determined through the Southeast Data, Assessment and Review (SEDAR) process. In 2004, golden tilefish was assessed as part of SEDAR 4 (2004), using landings, age, length, and abundance index data through 2002. The model estimates suggested the golden tilefish stock was undergoing overfishing and that it was very close to being overfished.

The latest stock assessment for golden tilefish (SEDAR 25 2011) indicated that the South Atlantic population is not overfished nor undergoing overfishing. The current level of spawning stock biomass (SSB_{2010}) is estimated to be well above the Minimum Stock Size Threshold (MSST) -- $SSB_{2010}/MSST = 2.43$. The current level of fishing is slightly higher than one-third of F_{MSY} ($F_{2008\text{-}2010}/F_{MSY} = 0.36$). More information on the SEDAR assessments for golden tilefish can be found in **Chapter 3**.

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

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

Fish populations

Quantitative definitions of overfishing and overfished for golden tilefish are identified in Amendments 11 and 12 to the Snapper Grouper FMP (SAFMC 1998 and 1998b). Numeric values of thresholds overfishing and overfished for golden tilefish were updated/modified in Amendment 15B (SAFMC 2008b). These values include maximum sustainable yield (MSY), the fishing mortality rate that produces MSY (F_{MSY}), the biomass or biomass proxy that supports MSY (B_{MSY}), the minimum stock size threshold below which a stock is considered to be overfished (MSST), the maximum fishing mortality threshold above which a stock is considered to be undergoing

overfishing (MFMT), and optimum yield (OY). Amendment 15B to the Snapper Grouper FMP also provided new definitions of MSST for golden tilefish. Amendment 15B became effective in December 2009.

Climate change

Global climate changes could have significant effects on South Atlantic fisheries. However, the extent of these effects is not known at this time. Possible impacts include temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (Kennedy et al. 2002).

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

7. Define a baseline condition for the resources, ecosystems, and human communities.

The purpose of defining a baseline condition for the resource and ecosystems in the area of the proposed action is to establish a point of reference for evaluating the extent and significance of expected cumulative effects. The SEDAR assessments show trends in biomass, fishing mortality, fish weight, and fish length going back to the earliest periods of data collection. For some species such as golden tilefish, assessments reflect initial periods when the stock was above B_{MSY} and fishing mortality was fairly low. However, some species such as red snapper were heavily exploited or possibly overfished when data were first collected. As a result, the assessment must make an assumption of the biomass at the start of the assessment period thus modeling the baseline reference points for the species.

For a detailed discussion of the baseline conditions of each of the species addressed in this amendment the reader is referred to those stock assessment and stock information sources referenced in **Item Number 6** of this CEA.

8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities (Table 6-1).

Table 6-1. The cause and effect relationship of fishing and regulatory actions within the time period of the Cumulative Effects Analysis (CEA).

Time period/dates	Cause	Observed and/or Expected Effects
Pre-January 12, 1989	Habitat destruction, growth overfishing of vermilion snapper.	Damage to snapper grouper habitat, decreased yield per recruit of vermilion snapper.
January 1989	Trawl prohibition to harvest fish (SAFMC 1988).	Increase yield per recruit of vermilion snapper; eliminate trawl damage to live bottom habitat.
Pre-January 1, 1992	Overfishing of many snapper grouper species.	Spawning stock ratio of these species is estimated to be less than 30% indicating that they are overfished.
January 1992	Prohibited gear: fish traps south of Cape Canaveral, FL; entanglement nets; longline gear inside of 50 fathoms; powerheads and bangsticks in designated SMZs off SC. Size/Bag limits: 10" TL vermilion snapper (recreational only); 12" TL vermilion snapper (commercial only); 10 vermilion snapper/person/day; aggregate grouper bag limit of 5/person/day; and 20" TL gag, red, black, scamp, yellowfin, and yellowmouth grouper size limit (SAFMC 1991a).	Reduce mortality of snapper grouper species.
Pre-June 27, 1994	Damage to *Oculina* habitat.	Noticeable decrease in numbers and species diversity in areas of *Oculina* off FL
July 1994	Prohibition of fishing for and retention of snapper grouper species (HAPC renamed OECA; SAFMC 1993)	Initiated the recovery of snapper grouper species in OECA.
1992-1999	Declining trends in biomass and overfishing continue for a number of snapper grouper species including golden tilefish.	Spawning potential ratio for golden tilefish is less than 30% indicating that they are overfished.
July 1994	Commercial quota for golden tilefish; commercial trip limits for golden tilefish; include golden tilefish in grouper recreational aggregate bag limits.	
February 24, 1999	All S-G without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runners. Vessels with longline gear aboard may only possess snowy, Warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.	
October 23, 2006	Snapper grouper FMP Amendment 13C	Commercial vermilion snapper quota

Time period/dates	Cause	Observed and/or Expected Effects
	(SAFMC 2006)	set at 1.1 million pounds gutted weight; recreational vermilion snapper size limit increased to 12" TL to prevent vermilion snapper overfishing.
Effective February 12, 2009	Snapper grouper FMP Amendment 14 (SAFMC 2007)	Use marine protected areas (MPAs) as a management tool to promote the optimum size, age, and genetic structure of slow growing, long-lived deepwater snapper grouper species (e.g., speckled hind, snowy grouper, warsaw grouper, yellowedge grouper, misty grouper, golden tilefish, blueline tilefish, and sand tilefish). Gag and vermilion snapper occur in some of these areas.
Effective March 20, 2008	Snapper grouper FMP Amendment 15A (SAFMC 2008a)	Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.
Effective Dates Dec 16, 2009, to Feb 16, 2010.	Snapper grouper FMP Amendment 15B (SAFMC 2008b)	End double counting in the commercial and recreational reporting systems by prohibiting the sale of bag-limit caught snapper grouper, and minimize impacts on sea turtles and smalltooth sawfish.
Effective Date July 29, 2009	Snapper grouper FMP Amendment 16 (SAFMC 2009a)	Protect spawning aggregations and snapper grouper in spawning condition by increasing the length of the spawning season closure, decrease discard mortality by requiring the use of dehooking tools, reduce overall harvest of gag and vermilion snapper to end overfishing.
Effective Date January 4, 2010	Red Snapper Interim Rule	Prohibit commercial and recreational harvest of red snapper from January 4, 2010, to June 2, 2010 with a possible 186-day extension. Reduce overfishing of red snapper while long-term measures to end overfishing are addressed in Amendment 17A.
Effective Date December 4, 2010	Snapper Grouper FMP Amendment 17A (SAFMC 2010a).	SFA parameters for red snapper; ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; accountability measures. Establish rebuilding plan for red snapper.
Effective Date January 31, 2011	Snapper Grouper Amendment 17B (SAFMC 2010b)	ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; AMs, for species undergoing overfishing.
Effective Date July 15, 2011	Regulatory Amendment 9 (SAFMC 2011a)	Harvest management measures for black sea bass; commercial trip limits for gag, vermilion and greater

Time period/dates	Cause	Observed and/or Expected Effects
		amberjack
Target 2011	Regulatory Amendment 11 (SAFMC 2011b)	Re-addresses the deepwater area closure implemented in Amendment 17B
2011	Comprehensive ACL Amendment (SAFMC 2011c)	ACLs ACTs, and AMs for species not experiencing overfishing; accountability measures; an action to remove species from the fishery management unit as appropriate; and management measures to limit recreational and commercial sectors to their ACTs.
Target 2012	Snapper Grouper FMP Amendment 24 (2011d)	Prevent overfishing and implement a rebuilding plan in the red grouper fishery.
Target 2012	Snapper Grouper FMP Amendment 20A (2011e)	Redistribute inactive wreckfish shares.
Target 2012	Snapper Grouper FMP Amendment 18A (2011f)	Prevent overexploitation in the black sea bass fishery.
Target 2012	Snapper Grouper Amendment 18B (under dev)	Establish an endorsement program for golden tilefish.

9. Determine the magnitude and significance of cumulative effects.

Proposed management actions, as summarized in **Chapter 2** of this document, would adjust the ACL, OY, establish a commercial ACT, and modify recreational AMs for the golden tilefish portion of the snapper grouper fishery. Detailed discussions of the magnitude and significance of the preferred alternatives appear in **Chapter 4** of this document.

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

The cumulative effects on the biophysical environment are expected to be negligible. Avoidance, minimization, and mitigation are not applicable.

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

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

6.2 Socioeconomic

A description of the human environment, including a description of commercial and recreational snapper grouper fisheries and associated key fishing communities is contained in Jepson et al. (2005) and Amendment 17B (SAFMC (2010b) and incorporated herein by reference. A description of the history of management of the snapper grouper fishery is contained in **Appendix E** and is incorporated herein by reference. Participation in and the economic performance of the fishery have been affected by a combination of regulatory, biological, social, and external economic factors. Regulatory measures have obviously affected the quantity and composition of harvests, through the various size limits, seasonal restrictions, trip or bag limits, and quotas. Gear restrictions, notably fish trap and longline restrictions, have also affected harvests and economic performance. The limited access program implemented in 1998/1999 substantially affected the number of participants in the fishery. Biological forces that either motivate certain regulations or simply influence the natural variability in fish stocks have played a role in determining the changing composition of the fishery. Additional factors, such as changing career or lifestyle preferences, stagnant to declining ex-vessel fish prices due to imports, increased operating costs (e.g., gas, ice, insurance, dockage fees, etc.), and increased waterfront/coastal value leading to development pressure for non-fishery uses have impacted both the commercial and recreational fishing sectors.

Given the variety of factors that affect fisheries, persistent data issues, and the complexity of trying to identify cause-and-effect relationships, it is not possible to differentiate actual or cumulative regulatory effects from external cause-induced effects. In general, it can be stated, however, that the regulatory environment for all fisheries has become progressively more complex and burdensome, increasing, in tandem with other adverse influences, the likelihood of economic losses, business failure, occupational changes, and associated adverse pressures on associated families, communities, and industries. Some reverse of this trend is possible and expected. The establishment of ACLs and AMs for species undergoing overfishing is expected to help protect and sustain harvest at the optimum yield level. However, certain pressures would remain, such as total effort and total harvest considerations, increasing input costs, import induced price pressure, and competition for coastal access.

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

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

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

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

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

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

Other amendments are expected to be implemented during 2012, which could further affect harvest of snapper grouper species. The Comprehensive ACL Amendment has been approved by the Secretary of Commerce and will specify ACLs for snapper grouper species not undergoing overfishing. Amendment 18A contains measures to limit participation and effort in the black sea bass fishery, reduce bycatch in the black sea bass pot fishery, changes to the rebuilding strategy and other necessary changes to the management of black sea bass as a result of the ongoing stock assessment. Amendment 18B would establish an endorsement program for golden tilefish. Regulatory Amendment 11 would remove the current deepwater closure beyond 240 ft for six deepwater snapper grouper species. Amendment 20A would distribute shares from inactive participants in the wreckfish ITQ system to active shareholders. Amendment 24 considers a rebuilding plan for red grouper, which is overfished and undergoing overfishing.

Chapter 7. Other Things to Consider

7.1 Unavoidable Adverse Effects

There are several unavoidable adverse effects on the socioeconomic environment that may result from the implementation of Regulatory Amendment 12 (Regulatory Amendment 12) to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP). These may include a derby style fishery to harvest an increased amount of golden tilefish quota, and inequity of harvest among fishermen in Florida, North Carolina, South Carolina, and Georgia. These issues are being addressed through the South Atlantic Fishery Management Council's (South Atlantic Council) development of Amendment 18B.

7.2 Effects of the Fishery on Essential Fish Habitat

The biological impacts of the proposed actions are described in **Chapter 4**, including impacts on habitat. No actions proposed in this amendment are anticipated to have any adverse impact on essential fish habitat (EFH) or EFH-Habitat of Particular Concern (EFH-HAPC) for managed species including species in the snapper grouper complex. Any additional impacts of fishing on EFH identified during the public hearing process will be considered, therefore the South Atlantic Council has determined no new measures to address impacts on EFH are necessary at this time. The South Atlantic Council's adopted habitat policies, which may directly affect the area of concern, are available for download through the Habitat/Ecosystem section of the South Atlantic Council's website: http://map.mapwise.com/safmc/Default.aspx?tabid=56.

NOTE: The Final EFH Rule, published on January 17, 2002, (67 FR 2343) replaced the interim Final Rule of December 19, 1997 on which the original EFH and EFH-HAPC designations were made. The Final Rule directs the Councils to periodically update EFH and EFH-HAPC information and designations within fishery management plans. As was done with the original Habitat Plan (SAFMC 1998c), a series of technical workshops were conducted by South Atlantic Council staff and a draft plan that includes new information has been completed pursuant to the Final EFH Rule.

7.3 Damage to Ocean and Coastal Habitats

The actions proposed in Regulatory Amendment 12 would not result in any adverse impacts to ocean and coastal habitats.

The alternatives and proposed actions are not expected to have any adverse effect on the ocean and coastal habitat. Management measures implemented in the original Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Snapper Grouper FMP) through Amendment 7 to the Snapper Grouper FMP (SAFMC 1994a) combined have significantly reduced the impact of the snapper grouper fishery on essential fish habitat (EFH). The South Atlantic Council has reduced the impact of the fishery and protected EFH by prohibiting the use of poisons and explosives; prohibiting use of fish traps and entanglement nets in the exclusive

economic zone (EEZ); banning use of bottom trawls on live/hard bottom habitat north of Cape Canaveral, Florida; restricting use of bottom longline to depths greater than 50 fathoms north of St. Lucie Inlet; and prohibiting use of black sea bass pots south of Cape Canaveral, Florida. These gear restrictions have significantly reduced the impact of the fishery on coral and live/hard bottom habitat in the South Atlantic Region.

Additional management measures in Amendment 8 to the Snapper Grouper FMP (SAFMC 1997a), including specifying allowable bait nets and capping effort, have protected habitat by making existing regulations more enforceable. Establishing a controlled effort program limited overall fishing effort and to the extent there is damage to the habitat from the fishery (e.g. black sea bass pots, anchors from fishing vessels, impacts of weights used on fishing lines and bottom longlines), limited such impacts.

In addition, measures in Amendment 9 to the Snapper Grouper FMP (SAFMC 1997b), that include further restricting longlines to retention of only deepwater species and requiring that black sea bass pots have escape panels with degradable fasteners, reduce the catch of undersized fish and bycatch and ensure that the pot, if lost, will not continues to "ghost" fish. Amendment 13C to the Snapper Grouper FMP (SAFMC 2006) increased mesh size in the back panel of pots, which has reduced bycatch and retention of undersized fish.

Amendment 15B to the Snapper Grouper FMP (SAFMC 2008b) includes an action that would implement sea turtle bycatch release equipment requirements and sea turtle and smalltooth sawfish handling protocols and/or guidelines in the permitted commercial and for-hire snapper grouper fishery effective February 15, 2010.

Amendment 16 to the Snapper Grouper FMP (SAFMC 2009a) included an action, which is intended to reduce bycatch by requiring fishermen use dehooking devices effective July 29, 2009. Limiting the overall fishing mortality reduces the likelihood of over-harvesting of species with the resulting loss in genetic diversity, ecosystem diversity, and sustainability.

Measures adopted in the FMP for Coral, Coral Reefs, and Live/Hardbottom Habitats of the South Atlantic Region and FMP for the Shrimp Fishery of the South Atlantic Region have further restricted access by fishermen that had potential adverse impacts on essential snapper grouper habitat. These measures include the designation of the Oculina Bank Habitat of Particular Concern (HAPC) and the Rock Shrimp closed area (see the Shrimp and Coral FMP/Amendment documents for additional information).

The South Atlantic Council's Comprehensive Habitat Amendment (SAFMC 1998d) contains measures that expanded the Oculina Bank HAPC and added two additional satellite HAPCs. Amendment 14 to the Snapper Grouper FMP (SAFMC 2007), established marine protected areas where fishing for or retention of snapper grouper species is prohibited.

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

The relationship between short-term uses and long-term productivity will not be affected by this amendment. The proposed actions would allow for an increase in the Annual Catch Limit (ACL) based on the most recent stock assessment. An ACL has been established for golden tilefish through Amendment 17B to the Snapper Grouper FMP and Action 1 in Regulatory Amendment 12 to the Snapper Grouper FMP could increase the golden tilefish ACL. The actions being proposed in this amendment would not have an impact on the short-term uses and long-term productivity.

7.5 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments are defined as commitments that cannot be reversed, except perhaps in the extreme long-term, whereas irretrievable commitments are lost for a period of time. None of the actions proposed by this amendment would result in irreversible or irretrievable commitments of resources.

7.6 Unavailable or Incomplete Information

The Council on Environmental Quality, in its implementing regulations for the National Environmental Policy Act, addressed incomplete or unavailable information at 40 CFR 1502.22 (a) and (b). That regulation has been considered. There are two tests to be applied: 1) Does the incomplete or unavailable information involve "reasonable foreseeable adverse effects…;" and 2) is the information about these effects "essential to a reasoned choice among alternatives…". A stock assessment has been conducted on golden tilefish using the best available data, which indicate the stock is not overfished and is not undergoing overfishing. Status determinations for the species were derived from the Southeast Data, Assessment, and Review (SEDAR) process, which involves a series of three workshops designed to ensure each stock assessment reflects the best available scientific information. The findings and conclusions of each SEDAR workshop are documented in a series of reports, which are ultimately reviewed and discussed by the South Atlantic Council and their Scientific and Statistical Committee (SSC). SEDAR participants, the South Atlantic Council's Advisory Panels, the South Atlantic Council, and NOAA Fisheries Service staff reviewed and considered any concerns about the adequacy of the data. The South Atlantic Council's SSC determined that the assessments (SEDAR 4 2004; SEDAR 25 2011) were based on the best available data.

7.7 Environmental Justice Considerations

Executive Order 12898 requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. This executive order is generally referred to as Environmental Justice (EJ).

To evaluate EJ considerations for the proposed actions, information on poverty and minority rates is examined at the county level. Information on the race and income status for groups at the different participation levels (vessel owners, crew, dealers, processors, employees, employees of associated support industries, etc.) is not available. Because the proposed actions would be expected to affect fishermen and associated industries in several communities along the South Atlantic coast and not just those profiled, it is possible that other counties or communities have poverty or minority rates that exceed the EJ thresholds.

In order to identify the potential for EJ concern, the rates of minority populations (non-white, including Hispanic) and the percentage of the population that was below the poverty line were examined. The threshold for comparison that was used was 1.2 times the state average for minority population rate and percentage of the population below the poverty line. If the value for the community or county was greater than or equal to 1.2 times the state average, then the community or county was considered an area of potential EJ concern. Census data for the year 2010 was used. Estimates of the state minority and poverty rates, associated thresholds, and community rates are provided in **Table 7-1**; note that only communities that exceed the minority threshold and/or the poverty threshold are included in the table**.**

While some communities expected to be affected by this proposed amendment may have minority or economic profiles that exceed the EJ thresholds and, therefore, may constitute areas of concern, significant EJ issues are not expected to arise as a result of this proposed amendment. No adverse human health or environmental effects are expected to accrue to this proposed amendment, nor are these measures expected to result in increased risk of exposure of affected individuals to adverse health hazards. The proposed management measures would apply to all participants in the affected area, regardless of minority status or income level, and information is not available to suggest that minorities or lower income persons are, on average, more dependent on the affected species than non-minority or higher income persons.

Golden tilefish is part of an important commercial fishery throughout the South Atlantic region, and specifically in Florida, and the fish is also targeted by recreational fishermen. The actions in this proposed amendment are expected to incur social and economic benefits to users and communities by implementing management measures that would contribute to conservation of the golden tilefish stock and to maintaining the commercial and recreational sectors of the fishery. Although there will be some short-term impacts through the implementation of ACLs/OYs, commercial ACT, and recreational AMs if one or both sectors of the fishery is closed early due to exceeding the limits, the overall long-term benefits of setting limits on golden tilefish harvest is expected to contribute to the social and economic health of South Atlantic communities. Additionally, the proposed actions incorporate an increase in allowable harvest, which will benefit South Atlantic fishermen and communities.

Finally, the general participatory process used in the development of fishery management measures (e.g., scoping meetings, public hearings, and open South Atlantic Council meetings) provides sufficient opportunity for meaningful involvement by potentially affected individuals to participate in the development process of this amendment and have their concerns factored into the decision process. Public input from individuals who participate in the fishery has been considered and incorporated into management decisions throughout development of the amendment.

Table 7-1. Environmental justice thresholds (Source: 2010 U.S. Census data).

State	County	Minority Rate	Minority Threshold*	Poverty Rate	Poverty Threshold*
Florida		**47.4**	**56.88**	**13.18**	**15.81**
	Broward	52.0	-4.6	11.7	4.11
	Miami-Dade	81.9	-34.5	16.9	-1.09
	Orange County	50.3	-2.9	12.7	3.11
	Osceola	54.1	-6.7	13.3	2.51
Georgia		**50.0**	**60.0**	**15.0**	**18.0**
	Liberty	53.2	-3.2	17.5	0.5
South Carolina		**41.9**	**50.28**	**15.82**	**18.98**
	Colleton	44.4	-2.5	21.4	-2.42
	Georgetown	37.6	4.3	19.3	-0.32
	Hampton	59.0	-17.1	20.2	-1.22
	Jasper	61.8	-19.9	9.9	-0.92
North Carolina		**39.1**	**46.92**	**15.07**	**18.08**
	Bertie	64.6	-25.50	22.5	-4.42
	Chowan	39.2	-0.1	18.6	-0.52
	Gates	38.8	0.3	18.3	-0.22
	Hertford	65.3	-26.2	23.5	-5.42
	Hyde	44.5	-5.4	16.2	1.88
	Martin	48.4	-9.3	23.9	-5.82
	Pasquotank	43.4	-4.3	16.3	1.78
	Perquimans	27.7	11.4	18.6	-0.52
	Tyrrell	43.3	-4.2	19.9	-1.82
	Washington	54.7	-15.6	25.8	-7.72

*The county minority and poverty thresholds are calculated by comparing the county minority rate and poverty estimate to 1.2 times the state minority and poverty rates. A negative value for a county indicates that the threshold has been exceeded.

Chapter 8. Other Applicable Law

8.1 Administrative Procedures Act

All federal rulemaking is governed under the provisions of the Administrative Procedures Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NMFS is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it takes effect, with some exceptions. This amendment complies with the provisions of the APA through the 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 request for public comments, which complies with the APA.

8.2 Information Quality Act

The Information Quality Act (Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-443)) which took effect October 1, 2002, directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidelines to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with OMB guidelines, and report periodically to OMB on the number and nature of complaints.

The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Information Quality Act (IQA). This document has used the best available information and made a broad presentation thereof. The process of public review of this document provides an opportunity for comment and challenge to this information, as well as for the provision of additional information.

The information contained in this document was developed using best available scientific information. Therefore, this Amendment and Environmental Assessment are in compliance with the IQA.

8.3 Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act (CZMA) of 1972 requires that all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. While it is the goal of the South Atlantic Council to have management measures that complement those of the states, federal and state administrative procedures vary and regulatory changes are unlikely to be fully instituted at the same time. Based on the analysis of the environmental consequences of the

proposed action in **Chapter 4**, the South Atlantic Council has concluded this amendment would improve federal management of the golden tilefish and is consistent to the maximum extent practicable with the Coastal Zone Management Plans of Florida, Georgia, South Carolina, and North Carolina. This determination will be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management Programs in the States of Florida, South Carolina, Georgia, and North Carolina.

8.4 Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 U.S.C. Section 1531 et seq.) requires that federal agencies must ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or the habitat designated as critical to their survival and recovery. The ESA requires NOAA Fisheries Service to consult with the appropriate administrative agency (itself for most marine species, and the U.S. Fish and Wildlife Service for all remaining species) when proposing an action that may affect threatened or endangered species or adversely modify critical habitat. Consultations are necessary to determine the potential impacts of the proposed action. They are concluded informally when proposed actions may affect but are "not likely to adversely affect" threatened or endangered species or designated critical habitat. Formal consultations, resulting in a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" threatened or endangered species or adversely modify designated critical habitat.

8.5 Executive Order 12612: Federalism

E.O. 12612 requires agencies to be guided by the fundamental federalism principles when formulating and implementing policies that have federalism implications. The purpose of the Order is to guarantee the division of governmental responsibilities between the Federal government and the States, as intended by the framers of the Constitution. No federalism issues have been identified relative to the actions proposed in this amendment and associated regulations. Therefore, preparation of a Federalism assessment under E.O. 13132 is not necessary.

8.6 Executive Order 12866: Regulatory Planning and Review

E.O. 12866, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NMFS prepares a Regulatory Impact Review (RIR) for all fishery regulatory actions that implement a new FMP or that significantly amend an existing plan. RIRs provide a comprehensive analysis of the costs and benefits to society associated with proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O.

12866 and whether proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the RFA. A regulation is significant if it is likely to result in an annual effect on the economy of at least $100,000,000 or if it has other major economic effects.

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

8.7 Executive Order 12962: Recreational Fisheries

E.O. 12962 requires federal agencies, in cooperation with States and Tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects. Additionally, the order establishes a seven member National Recreational Fisheries Coordination Council responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The Council also is responsible for developing, in cooperation with Federal agencies, States and Tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires NMFS and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

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

8.8 Executive Order 13089: Coral Reef Protection

E.O. 13089, signed by President William Clinton on June 11, 1998, recognizes the ecological, social, and economic values provided by the Nation's coral reefs and ensures that federal agencies are protecting these ecosystems. More specifically, the Order requires federal

agencies to identify actions that may harm U.S. coral reef ecosystems, to utilize their program and authorities to protect and enhance the conditions of such ecosystems, and to ensure that their actions do not degrade the condition of the coral reef ecosystem.

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

8.9 Executive Order 13158: Marine Protected Areas

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

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

8.10 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. It also prohibits the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NOAA Fisheries Service) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs.

Part of the responsibility that NOAA Fisheries Service has under the MMPA involves monitoring populations of marine mammals to make sure that they stay at optimum levels. If a population falls below its optimum level, it is designated as "depleted." A conservation plan is then developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries; and studies of pinniped-fishery interactions. The MMPA requires a commercial fishery to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals. Category I designates fisheries with frequent serious

injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities.

Under the MMPA, to legally fish in a Category I and/or II fishery, a fisherman must take certain steps. For example, owners of vessels or gear engaging in a Category I or II fishery, are required to obtain a marine mammal authorization by registering with the Marine Mammal Authorization Program (50 CFR 229.4). They are also required to accommodate an observer if requested (50 CFR 229.7(c)) and they must comply with any applicable take reduction plans.

The golden tilefish component of the snapper grouper fishery in the South Atlantic is listed as a Category III fishery in the 2009 Proposed List of Fisheries (LOF)(73 FR 33760; June 13, 2008). No incidentally killed or injured marine mammal species has been documented in this fishery.

8.11 Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act (MBTA) implemented several bilateral treaties for bird conservation between the United States and Great Britain, the United States and Mexico, the United States and Japan, and the United States and the former Union of Soviet Socialists Republics. Under the MBTA, it is unlawful to pursue, hunt, take, capture, kill, possess, trade, or transport any migratory bird, or any part, nest, or egg of a migratory bird, included in treaties between the, except as permitted by regulations issued by the Department of the Interior (16 U.S.C. 703-712). Violations of the MBTA carry criminal penalties. Any equipment and means of transportation used in activities in violation of the MBTA may be seized by the United States government and, upon conviction, must be forfeited to it.

Executive Order 13186 directs each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement a memorandum of understanding (MOU) with the U.S. Fish and Wildlife Service (USFWS) to conserve those bird populations. In the instance of unintentional take of migratory birds, NOAA Fisheries Service would develop and use principles, standards, and practices that will lessen the amount of unintentional take in cooperation with the USFWS. Additionally, the MOU would ensure that National Environmental Policy Act (NEPA) analyses evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern.

An MOU is currently being developed, which will address the incidental take of migratory birds in commercial fisheries under the jurisdiction of NOAA Fisheries Service. NOAA Fisheries Service must monitor, report, and take steps to reduce the incidental take of seabirds that occurs in fishing operations. The United States has already developed the U.S. National Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries. Under that plan many potential MOU components are already being implemented.

The alternatives considered in this amendment are consistent with the directives of E.O. 13186.

8.12 National Environmental Policy Act

This amendment to the South Atlantic Snapper Grouper FMP has been written and organized in a manner that meets NEPA requirements, and thus is a consolidated NEPA document, including a draft Environmental Assessment as described in NOAA Administrative Order (NAO) 216-6, Section 6.03.a.2.

Purpose and Need for Action
The purpose and need for this action are described in **Section 1.1.**

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

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

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

8.13 National Marine Sanctuaries Act

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

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

8.14 Paperwork Reduction Act

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

and policies, approval of information collection requests, and reduction of paperwork burdens and duplications. PRA requires NOAA Fisheries Service to obtain approval from the OMB before requesting most types of fishery information from the public.

8.15 Regulatory Flexibility Act

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

Once preferred alternatives are selected, an Initial Regulatory Flexibility Analysis will be developed.

8.16 Small Business Act

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

8.17 Public Law 99-659: Vessel Safety

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

No vessel would be forced to participate in South Atlantic fisheries under adverse weather or ocean conditions as a result of the imposition of management regulations proposed in this amendment.

No concerns have been raised by South Atlantic fishermen or by the U.S. Coast Guard that the proposed management measures directly or indirectly pose a hazard to crew or vessel safety under adverse weather or ocean conditions. Therefore, this amendment proposes neither procedures for making management adjustments due to vessel safety problems nor procedures to monitor, evaluate, or report on the effects of management measures on vessel or crew safety under adverse weather or ocean conditions.

Chapter 9. List of Preparers

Table 9-1. List of preparers.

Name	Agency/Division	Area of Amendment Responsibility
Karla Gore	NMFS/SF	SERO IPT Lead/Fishery Scientist
Gregg Waugh	SAFMC	SAFMC IPT Lead/Fishery Biologist
Myra Brouwer	SAFMC	Fishery Biologist
Dr. Tony Lamberte	NMFS/SF	Economist
Dr. Jack McGovern	NMFS/SF	Fishery Scientist
Dr. Kari MacLauchlin	SAFMC	Fishery Social Scientist
Monica Smit-Brunello	NOAA/GC	Attorney Advisor

NMFS = National Marine Fisheries Service, SAFMC = South Atlantic Fishery Management Council, SF = Sustainable Fisheries Division, SERO = Southeast Regional Office, GC = General Counsel.

Chapter 10. List of Agencies, Organizations, and Persons To Whom Copies of the Environmental Assessment are Sent

Responsible Agency

Regulatory Amendment 12:
South Atlantic Fishery Management Council
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Environmental Assessment:
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List of Agencies, Organizations, and Persons Consulted

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

Chapter 11. References

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

Carter and Liese. 2010.

Dooley, J. K. 1978. Systematics and biology of the tilefishes (Perciformes:Branchiostegidae and Malacanthidae), with descriptions of two new species. U. S. Dep. Commer., NOAA Tech. Rep. NMFS Circ. 411, 78 p.

Grimes, C.B., C. F. Idelberger, K. W. Able, and S. C. Turner. 1988. The reproductive biology of tilefish, Lopholatilus chamaeleonticeps Goode and Bean, from the United States Mid-Atlantic Bight, and the effects of fishing on the breeding system. Fish. Bull. 86:745-762.

Harris, P.J., S.M. Padgett, and P.T. Powers. 2001. Exploitation-related changes in the growth and reproduction of tilefish and implications for the management of deep water fisheries. America Fisheries Society Symposium 23:199-210.

Huntsman, G.R., J. Potts, R. Mays, R.L. Dixon, P.W. Willis, M. Burton, and B.W. Harvey. 1992. A stock assessment of the snapper-grouper complex in the U.S. South Atlantic based on fish caught in 1990. Report to the South Atlantic Fishery Management Council. June 1992. NMFS Beaufort Lab, 101 Pivers Island Road, Beaufort, NC, 29516-9722.

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

Jepson, M., K. Kitner, A. Pitchon, W.W. Perry, and B. Stoffle. 2005. Potential fishing communities in the Carolinas, Georgia, and Florida: An effort in baseline profiling and mapping. NOAA Technical Report No. (TBD).

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

NMFS (National Marine Fisheries Service). 1991. South Atlantic snapper grouper assessment. 1991. DOC/NOAA/NMFS/SEFSC. Staff report by NMFS Beaufort Lab, 101 Pivers Island Road, Beaufort, NC 28516. Unpublished manuscript. 6pp.

PDT (Plan Development Team). 1990. South Atlantic snapper grouper assessment. Prepared by NMFS Beaufort Lab with input from the South Atlantic Council's Plan Development Team. Report to the South Atlantic Fishery Management Council. August 1990. NMFS Beaufort Lab, 101 Pivers Island Road, Beaufort, NC, 29516-9722.

Potts, J.C. and K. Brennan. 2001. Trends in catch data and static SPR values for 15 species of reef fish landed along the southeastern United States. Report for South Atlantic Fishery Management Council, Charleston, SC.

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

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

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

SAFMC (South Atlantic Fishery Management Council). 1988. Amendment 1 and Environmental Assessment and Regulatory Impact Review to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 63 pp.

SAFMC (South Atlantic Fishery Management Council). 1993. Amendment 6 and Environmental Assessment and Regulatory Impact Review to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 202 pp.

SAFMC (South Atlantic Fishery Management Council). 1994a. Amendment 7 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1997a. Amendment 8 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1997b. Amendment 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699.

SAFMC (South Atlantic Fishery Management Council). 1998. Comprehensive Amendment Addressing Sustainable Fishery Act Definitions and Other Required Provisions in Fishery Management Plans of the South Atlantic Region (Amendment 11 to the Snapper Grouper FMP). South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 151 pp.

SAFMC (South Atlantic Fishery Management Council). 1998b. Amendment 12 to the Snapper Grouper FMP. South Atlantic Fishery Management Council, 1 Southpark Cir., Suite 306, Charleston, S.C. 29407-4699. 151 pp.

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

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

SAFMC (South Atlantic Fishery Management Council). 2006. Amendment 13C, Final Environmental Assessment, Initial Regulatory Flexibility Analysis/Regulatory Impact Review, and Social Impact Assessment/Fishery Impact Statement for the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 1 Southpark Cir., Ste 306, Charleston, S.C. 29407-4699. 631 pp.

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

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

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

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

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

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

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

SAFMC (South Atlantic Fishery Management Council). 2011a. Regulatory Amendment 9 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011b. Regulatory Amendment 11 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011c. Comprehensive Annual Catch Limit Amendment for the Fisheries of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011d. Amendment 24 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011e. Amendment 20A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SAFMC (South Atlantic Fishery Management Council). 2011f. Amendment 18A to the Snapper Grouper Fishery of the South Atlantic Region South Atlantic Fishery Management Council, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SEDAR (Southeast Data, Assessment and Review) 4. 2004. South Atlantic Golden Tilefish. SEDAR, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

SEDAR (Southeast Data, Assessment and Review) 25. 2011. South Atlantic Golden Tilefish and Black Sea Bass. SEDAR, 4055 Faber Place, Ste 201, North Charleston, S.C. 29405.

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Appendix D. Human Environment. Regulatory Amendment 12 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region

Economic Description of the Commercial Fishery

Additional information on the commercial snapper grouper fishery is contained in previous amendments [Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2007), Amendment 15B (SAFMC 2008), and Amendment 16 (SAFMC 2008)] and is incorporated herein by reference.

Vessel, Harvest, and Revenue (1993-2010)

The golden tilefish portion of the snapper grouper fishery has seen a declining trend in the total number of trips taken and the number of vessels participating in the fishery since 1993 (Table 3-1). Snapper Grouper Amendment 6 (SAFMC 1993) reduced the quota of golden tilefish from approximately 1.8 million pounds to about 600,000 pounds. From 1993 to 1996, approximately 100 vessels per year participated in the fishery. By 2009 and 2010, that number had been reduced by approximately 50%. Regulatory actions in Amendment 6 (SAFMC 1993) account for the decrease in dealers that purchased golden tilefish from 1993 to 1994. From 1994 until 2010, there was a gradual trend in reducing the number of federally permitted snapper grouper dealers. The last year, 2010, saw only 13 dealers purchasing golden tilefish.

Table 3-1 also tracks changes over time in the dockside price per pound as well as total annual dockside revenue for golden tilefish. The columns labeled with "(nominal $)" indicate the price paid per pound or the overall annual revenue of golden tilefish using the value of that year's dollar. The columns labeled with "(2010 $)" indicate the price paid per pound or the overall annual revenue of golden tilefish using the value of the dollar in 2010. Dollar comparisons from one year to the next should only be made with dollar values in the "(2010 $)" columns as they are all on the same scale. Higher values in landings were associated with the larger landings in the earlier years of the time series where it was not unusual for landings to be valued at $1,000,000 or greater (2010 $). However, the higher total revenue figures in the early years were partially due to the greater number of pounds landed. When the price per pound is compared across years, there is a gradual trend shifting upwards over time. In 1993 the average price per pound paid for golden tilefish was $2.20 (2010 $). By 2010, that amount had increased to $3.02 (2010 $), or an increase of about 37% in price per pound value. This increase lead to the value of the 2010 fishery being the first time since 2000 that the fishery total revenue was greater than$1,000,000, in spite of lower quotas.

Table 3-1. Golden tilefish sector statistics, 1993-2010.

Year	Trips with a least one lb of GT	Number of Vessels that landed GT	Avg # trips taken per vessel	Number of Dealers that purchased GT	GT lbs, gutted weight	Dockside price per pound (nominal $)	Dockside price per pound (2010 $)	GT revenue (nominal $)	GT revenue (2010 $)
1993	869	107	8	90	1,190,353	$1.46	$2.20	$1,747,252	$2,636,670
1994	767	99	8	25	751,649	$1.69	$2.48	$1,266,321	$1,863,218
1995	688	102	7	19	623,048	$1.78	$2.54	$1,093,914	$1,565,187
1996	518	96	5	24	365,547	$2.01	$2.79	$707,401	$983,129
1997	554	91	6	22	346,966	$1.78	$2.42	$574,138	$780,026
1998	462	84	6	19	419,622	$1.85	$2.48	$763,541	$1,021,439
1999	553	84	7	20	520,650	$1.97	$2.58	$1,019,049	$1,333,792
2000	715	97	7	14	706,373	$2.10	$2.66	$1,467,817	$1,858,690
2001	472	87	5	20	437,705	$2.03	$2.49	$867,138	$1,067,671
2002	570	86	7	22	393,783	$2.07	$2.51	$792,300	$960,343
2003	397	65	6	20	309,851	$2.04	$2.42	$627,546	$743,696
2004	343	67	5	18	279,485	$2.09	$2.42	$572,598	$660,977
2005	358	66	5	15	324,127	$2.41	$2.69	$768,694	$858,261
2006	339	61	6	19	366,974	$2.40	$2.60	$894,157	$967,145
2007	595	67	9	15	285,431	$2.83	$2.97	$764,811	$804,331
2008	370	57	6	18	300,241	$2.68	$2.71	$769,115	$778,949
2009	384	49	8	14	313,311	$2.55	$2.60	$770,172	$782,805
2010	352	51	7	13	369,556	$3.02	$3.02	$1,097,989	$1,097,989

Source: NMFS Logbooks, October 19, 2011.

The 2009 and 2010 golden tilefish seasons were greatly truncated compared to previous years (Table 3-2). From October 2006 through July 2009, the quota was taken up earlier, by about a month sooner each subsequent year. In 2010 the season lasted only until mid April. Even averaged out across all five years in the series shown in Table 3-2, the majority of the quota was landed by the end of March.

Table 3-2. Golden tilefish landings in pounds (gw) by month, 2006-2010.

Month	Year					Avg %	Cum %
	2006	2007	2008	2009	2010	by month	by month
January	26,605	34,105	73,243	86,393	106,000	20%	20%
February	16,602	48,914	37,872	61,961	142,923	19%	39%
March	23,370	47,668	40,025	68,952	94,493	17%	56%
April	47,427	56,296	63,085	46,042	9,137	14%	69%
May	68,986	15,397	49,190	12,717	-	9%	78%
June	44,829	4,814	5,936	30,016	-	5%	83%
July	13,714	5,498	7,583	7,154	16,796	3%	86%
August	32,030	30,513	19,088	-	-	5%	91%
September	42,667	41,701	162	6	70	5%	97%
October	50,696	455	34	26	138	3%	100%
November	49	70	103	-	-	0%	100%
December	-	-	3,921	43	-	0%	100%

Source: NMFS Logbooks, October 19, 2011.

Similarly, in Table 3-3 the value of the fishery closely tracks the landings, indicating there is minimal fluctuation in the value of fish caught in terms of its dockside price per pound regardless of when in the season it is caught. While the price per pound fluctuates between seasons, it is relatively stable within a given season. Based on information shown in Tables 3-2 and 3-3, the overall length of the season does not seem to influence the dockside value of the fish. Based on these data, it is not possible to tell what leads to price per pound fluctuations between years.

Table 3-3. Golden tilefish landings revenue by month, 2006-2010.

Month	Year 2006	2007	2008	2009	2010	Avg % by month	Cum % by month
January	$60,832	$89,672	$191,172	$214,782	$345,992	21%	21%
February	$40,340	$133,881	$79,580	$129,883	$404,508	18%	39%
March	$57,063	$123,328	$114,210	$155,892	$275,368	17%	56%
April	$122,665	$129,215	$159,353	$134,248	$31,055	13%	70%
May	$169,631	$41,993	$119,230	$31,609	-	8%	78%
June	$92,881	$14,436	$16,261	$83,222	-	5%	83%
July	$29,482	$17,460	$21,785	$20,370	$40,649	3%	86%
August	$82,121	$92,639	$54,888	-	-	5%	91%
September	$111,017	$120,631	$411	$24	$158	5%	97%
October	$128,079	$1,397	$101	$55	$258	3%	100%
November	$47	$158	$385	-	-	0%	100%
December	-	-	$11,740	$87	-	0%	100%

Source: NMFS Logbooks, October 19, 2011.

Table 3-4 shows the number of vessels for each year that landed at least one pound of golden tilefish aggregated into landings value groupings that allows one roughly to see the distribution of landings value while still maintaining confidentiality. Only one grouping in the table, $5,001 to $25,000 for 2006 had confidential information. In order to account for all participating vessels, the values from that grouping were added to those of the $1,001 - $5,000 grouping. All dollar value groupings in Table 3-4 are in nominal, non-inflated dollars.

Prior to the terminal year of the series, at least 50% of all vessels that had at least one pound of golden tilefish, regardless of the total number of participating vessels, had less than $1,000 revenue from the fishery. A number of years had closer to 60% of the vessels with landings values less than $1,000. Roughly 13% to 22% of the vessels had annual revenue over $25,000 from the golden tilefish portion of the snapper grouper fishery with a few exceptions. Between 1993 and 2003 roughly 40% of vessels had landings revenue between $100 and $5,000. Beginning in 2004, vessels earning in that range increased to about 60% of the participating vessels.

Table 3-4. Total annual revenue from golden tilefish by numbers of vessels, 1993-2010.

Year	Up to $100	$100.01 - $1,000	$1,000.01 - $5,000	$5,000.01 - $25,000	More than $25,000	Total Vessels
1993	35	24	11	15	22	107
	33%	22%	10%	14%	21%	100%
1994	28	25	12	16	18	99
	28%	25%	12%	16%	18%	100%
1995	31	28	15	14	14	102
	30%	27%	15%	14%	14%	100%
1996	30	26	15	14	11	96
	31%	27%	16%	15%	11%	100%
1997	30	27	16	10	8	91
	33%	30%	18%	11%	9%	100%
1998	23	26	11	12	12	84
	27%	31%	13%	14%	14%	100%
1999	29	23	12	6	14	84
	35%	27%	14%	7%	17%	100%
2000	22	34	15	12	14	97
	23%	35%	15%	12%	14%	100%
2001	26	26	12	12	11	87
	30%	30%	14%	14%	13%	100%
2002	25	24	17	11	9	86
	29%	28%	20%	13%	10%	100%
2003	19	21	8	6	11	65
	29%	32%	12%	9%	17%	100%
2004	13	24	13	9	8	67
	19%	36%	19%	13%	12%	100%
2005	14	21	13	12	6	66
	21%	32%	20%	18%	9%	100%
2006	19	17	15	*conf.	10	61
	31%	28%	25%	-	16%	100%
2007	9	22	14	15	7	67
	13%	33%	21%	22%	10%	100%
2008	12	23	10	6	6	57
	21%	40%	18%	11%	11%	100%
2009	9	16	11	5	8	49
	18%	33%	22%	10%	16%	100%
2010	4	11	15	10	11	51
	8%	22%	29%	20%	22%	100%

(In 2010 dollars)

*confidential – data are combined with the "$1,000.01 - $5,000" category

Source: NMFS Logbooks, October 19, 2011.

Table 3-5 shows efficiency of targeting golden tilefish for the years 2006 – 2010 for vessels that landed at least one pound of golden tilefish. Vessels are aggregated according to the same groupings as in Table 3-4 based on the total value of the landed golden tilefish catch for that vessel for that year. Golden tilefish appear to be no more valuable per pound, on average, than the other fish sold on trips where golden tilefish were landed as indicated by the fact that the percent of pounds landed made up by golden tilefish was very close to the percent of the total value of the trips where golden tilefish were caught. It appears that vessels whose annual landings of golden tilefish is greater than $25,000 are adept at targeting the species with roughly 80-90% of landings comprised by golden tilefish on these trips. In general, participants in the golden tilefish portion of the snapper grouper fishery who have revenues greater than $5,000 tend to be longline vessels (reference Table 3-6). Many of the vessels landing up to $5,000 annually are not targeting golden tilefish specifically, but primarily land them as they are bottom fishing with hook and line or bandit gear for snappers and groupers, in general. All dollar value groupings in Table 3-5 are in nominal, non-inflated dollars.

Table 3-5. Average percent of pounds and value of the total catch of golden tilefish on trips by vessels where at least one pound of golden tilefish was caught by annual landings value groupings, 2006-2010.

Year	Total Annual Golden Tilefish Landings Value	Number of vessels	Total Pounds	Percent of Overall Total Lbs
2006	Up to $100	19	430	0%
	$100.01 - $1,000	17	3,047	1%
	$1,000.01 - $5,000	15	18,607	5%
	$5,000.01 - $25,000	conf.*	conf.*	
	More than $25,000	10	344,890	94%
	Total	61	366,974	
2007	Up to $100	9	146	0%
	$100.01 - $1,000	22	2,380	1%
	$1,000.01 - $5,000	14	12,364	4%
	$5,000.01 - $25,000	15	57,505	20%
	More than $25,000	7	213,037	75%
	Total	67	285,431	
2008	Up to $100	12	273	0%
	$100.01 - $1,000	23	4,036	1%
	$1,000.01 - $5,000	10	13,408	4%
	$5,000.01 - $25,000	6	25,397	8%
	More than $25,000	6	257,126	86%

	Total	57	300,241	

Table 3-5. Continued. Average percent of pounds and value of the total catch of golden tilefish on trips by vessels where at least one pound of golden tilefish was caught by annual landings value groupings, 2006-2010.

Year	Total Annual Golden Tilefish Landings Value	Number of vessels	Total Pounds	Percent of Overall Total Lbs
2009	Up to $100	9	182	0%
	$100.01 - $1,000	16	2,152	1%
	$1,000.01 - $5,000	11	10,807	3%
	$5,000.01 - $25,000	5	38,045	12%
	More than $25,000	8	262,125	84%
	Total	49	313,311	
2010	Up to $100	4	84	0%
	$100.01 - $1,000	11	1,223	0%
	$1,000.01 - $5,000	15	11,701	3%
	$5,000.01 - $25,000	10	31,607	9%
	More than $25,000	11	324,941	88%
	Total	51	369,556	

Source: NMFS Logbooks, October 19, 2011.

In each year from 2006 through 2010 roughly 10-20% of the vessels participating in the fishery account for75-94% of the landings (Table 3-6). Typically, these vessels use longline gear to land golden tilefish. Conversely, the majority of vessels with landings in the fishery harvest relatively small amounts. There is a significant hook and line component, however, even with the current regulations requiring a 300 lb trip limit after 75% of the ACL is caught, a number of longline vessels in the past have continued to fish the lower 300 lb trip limit which adds to the total annual revenue of longline vessels. All dollar value groupings in Table 3-6 are in nominal, non-inflated dollars.

Table 3-6. Pounds of golden tilefish landed by vessels in each annual value grouping, 2006-2010.

Year	Total Annual Golden Tilefish Landings Value	Total Pounds Landed by All Vessels	Percent of Total Landings
2006	Up to $100	2,401	0%
	$100.01 - $1,000	19,844	2%
	$1,000.01 - $5,000	185,753	21%
	$5,000.01 -	conf.*	conf.*

	$25,000		
	More than $25,000	686,159	77%
	Total	894,157	

Table 3-6. Continued. Pounds of golden tilefish landed by vessels in each annual value grouping, 2006-2010.

Year	Total Annual Golden Tilefish Landings Value	Total Pounds Landed by All Vessels	Percent of Total Landings
2007	Up to $100	2,176	0%
	$100.01 - $1,000	22,675	3%
	$1,000.01 - $5,000	115,329	15%
	$5,000.01 - $25,000	193,795	25%
	More than $25,000	430,835	56%
	Total	764,811	
2008	Up to $100	3,803	0%
	$100.01 - $1,000	19,788	3%
	$1,000.01 - $5,000	65,004	8%
	$5,000.01 - $25,000	58,332	8%
	More than $25,000	622,188	81%
	Total	769,115	
2009	Up to $100	1,779	0%
	$100.01 - $1,000	21,206	3%
	$1,000.01 - $5,000	18,439	2%
	$5,000.01 - $25,000	198,694	26%
	More than $25,000	530,053	69%
	Total	770,172	
2010	Up to $100	1,615	0%
	$100.01 - $1,000	29,795	3%
	$1,000.01 - $5,000	89,934	8%
	$5,000.01 - $25,000	249,798	23%
	More than $25,000	726,847	66%
	Total	1,097,989	

*confidential – data are combined with the "$1,000.01 - $5,000" category
Source: NMFS Logbooks, October 19, 2011.

Vessels, Harvest, and Revenue by Gear (1993-2010)

The longline fishery dominates commercial landings of golden tilefish. Longline landings from 1993 through 2010 ranged from a low of 86% in 2007 to a high of 99% in 1993 (Table 3-7). In recent years, the longline fishery accounted for 93-95% of all golden tilefish landings. Clearly, the 300 lb trip limit was not enough to keep longline vessels out of the fishery. The total number of vessels for each year is less than the sum of the vessels by gear type as often vessels will land golden tilefish using multiple gears.

Table 3-7 shows by year the average landings, both pounds and value, for all vessels that participated in the fishery by gear. The average annual pounds landed by vessels using hook and line gear ranged from a low of 215 lbs in 1996 to a high of 774 lbs in 2010. Conversely, the average annual pounds landed by vessels using longline gear ranged from a low of 9,504 lbs in 1996 to a high of 30,234 lbs in 2006. Other gears that were used to land golden tilefish included fish traps, spears, and gill nets among others and landings from other gears made up a very small portion of the overall landings in each year.

Table 3-7. Golden tilefish sector statistics by gear, 1993-2010.

Year	Gear	Lbs Golden Tilefish	Percent of Total GT Landings	GT Revenue (nominal $)	GT Revenue (2010 $)	Vessels	Avg. Annual lbs (gw) by Vessel	Avg. Annual Revenue by Vessel (nominal $)	Avg. Annual Revenue by Vessel (2010 $)
1993	H & L	13,312	1%	$19,362	$29,218	61	218	$317	$479
	Longline	1,175,917	99%	$1,726,233	$2,604,951	48	24,498	$35,963	$54,270
	Other	1,123	0%	$1,657	$2,501	9	125	$184	$278
	Total	1,190,353		$1,747,252	$2,636,670	107	11,125	$16,329	$24,642
1994	H & L	18,339	2%	$30,655	$45,104	63	291	$487	$716
	Longline	731,683	97%	$1,232,983	$1,814,166	43	17,016	$28,674	$42,190
	Other	1,627	0%	$2,683	$3,947	8	203	$335	$493
	Total	751,649		$1,266,321	$1,863,218	99	7,592	$12,791	$18,820
1995	H & L	20,251	3%	$35,918	$51,392	72	281	$499	$714
	Longline	602,582	97%	$1,057,660	$1,513,314	35	17,217	$30,219	$43,238
	Other	216	0%	$336	$481	4	54	$84	$120
	Total	623,048		$1,093,914	$1,565,187	102	6,108	$10,725	$15,345
1996	H & L	13,540	4%	$28,259	$39,273	63	215	$449	$623
	Longline	351,646	96%	$678,416	$942,847	37	9,504	$18,336	$25,482
	Other	361	0%	$726	$1,010	4	90	$182	$252
	Total	365,547		$707,401	$983,129	96	3,808	$7,369	$10,241
1997	H & L	27,742	8%	$50,282	$68,313	71	391	$708	$962
	Longline	318,772	92%	$522,970	$710,509	25	12,751	$20,919	$28,420
	Other	451	0%	$885	$1,202	4	113	$221	$301
	Total	346,966		$574,138	$780,026	91	3,813	$6,309	$8,572
1998	H & L	24,262	6%	$44,139	$59,047	55	441	$803	$1,074
	Longline	393,479	94%	$715,730	$957,480	27	14,573	$26,509	$35,462
	Other	1,881	0%	$3,671	$4,912	8	235	$459	$614
	Total	419,622		$763,541	$1,021,439	84	4,995	$9,090	$12,160

Table 3-7. Continued. Golden tilefish sector statistics by gear, 1993-2010.

Year	Gear	Lbs Golden Tilefish	Percent of Total GT Landings	GT Revenue (nominal $)	GT Revenue (2010 $)	Vessels	Avg. Annual lbs (gw) by Vessel	Avg. Annual Revenue by Vessel (nominal $)	Avg. Annual Revenue by Vessel (2010 $)
1999	H & L	25,167	5%	$50,136	$65,621	56	449	$895	$1,172
	Longline	490,425	94%	$959,015	$1,255,216	22	22,292	$43,592	$57,055
	Other	5,058	1%	$9,898	$12,955	13	389	$761	$997
	Total	520,650		$1,019,049	$1,333,792	84	6,198	$12,132	$15,878
2000	H & L	36,493	5%	$77,264	$97,839	63	579	$1,226	$1,553
	Longline	666,420	94%	$1,382,013	$1,750,036	27	24,682	$51,186	$64,816
	Other	3,459	0%	$8,540	$10,814	19	182	$449	$569
	Total	706,373		$1,467,817	$1,858,690	97	7,282	$15,132	$19,162
2001	H & L	21,928	5%	$41,627	$51,254	57	385	$730	$899
	Longline	414,884	95%	$823,644	$1,014,119	28	14,817	$29,416	$36,219
	Other	892	0%	$1,866	$2,298	11	81	$170	$209
	Total	437,705		$867,138	$1,067,671	87	5,031	$9,967	$12,272
2002	H & L	39,463	10%	$77,611	$94,073	64	617	$1,213	$1,470
	Longline	349,833	89%	$705,723	$855,404	24	14,576	$29,405	$35,642
	Other	4,487	1%	$8,965	$10,866	12	374	$747	$906
	Total	393,783		$792,300	$960,343	86	4,579	$9,213	$11,167
2003	H & L	15,869	5%	$31,788	$37,671	50	317	$636	$753
	Longline	293,671	95%	$595,113	$705,261	17	17,275	$35,007	$41,486
	Other	311	0%	$645	$765	8	39	$81	$96
	Total	309,851		$627,546	$743,696	65	4,767	$9,655	$11,441
2004	H & L	22,062	8%	$47,496	$54,827	49	450	$969	$1,119
	Longline	257,360	92%	$524,924	$605,944	22	11,698	$23,860	$27,543
	Other	conf.	conf.	conf.	conf.	conf.	conf.	conf.	conf.
	Total	279,485		$572,598	$660,977	67	4,171	$8,546	$9,865

Table 3-7. Continued. Golden tilefish sector statistics by gear, 1993-2010.

Year	Gear	Lbs Golden Tilefish	Percent of Total GT Landings	GT Revenue (nominal $)	GT Revenue (2010 $)	Vessels	Avg. Annual lbs (gw) by Vessel	Avg. Annual Revenue by Vessel (nominal $)	Avg. Annual Revenue by Vessel (2010 $)
2005	H & L	33,854	10%	$81,428	$93,996	51	664	$1,597	$1,843
	Longline	288,688	89%	$683,323	$762,942	16	18,043	$42,708	$47,684
	Other	1,585	0%	$3,944	$4,403	11	144	$359	$400
	Total	324,127		$768,694	$858,261	66	4,911	$11,647	$13,004
2006	H & L	32,180	9%	$78,455	$84,859	54	596	$1,453	$1,571
	Longline	332,578	91%	$811,305	$877,530	11	30,234	$73,755	$79,775
	Other	2,216	1%	$4,397	$4,756	8	277	$550	$595
	Total	366,974		$894,157	$967,145	61	6,016	$14,658	$15,855
2007	H & L	38,921	14%	$113,021	$118,861	56	695	$2,018	$2,123
	Longline	245,477	86%	$648,832	$682,359	16	15,342	$40,552	$42,647
	Other	1,033	0%	$2,958	$3,111	6	172	$493	$518
	Total	285,431		$764,811	$804,331	67	4,260	$11,415	$12,005
2008	H & L	19,746	7%	$49,694	$50,329	46	429	$1,080	$1,094
	Longline	279,312	93%	$716,302	$725,461	13	21,486	$55,100	$55,805
	Other	1,183	0%	$3,119	$3,159	11	108	$284	$287
	Total	300,241		$769,115	$778,949	57	5,267	$13,493	$13,666
2009	H & L	13,745	4%	$35,852	$36,440	36	382	$996	$1,012
	Longline	298,975	95%	$733,103	$745,128	13	22,998	$56,393	$57,318
	Other	591	0%	$1,218	$1,238	5	118	$244	$248
	Total	313,311		$770,172	$782,805	49	6,394	$15,718	$15,976
2010	H & L	24,774	7%	$72,408	$72,408	32	774	$2,263	$2,263
	Longline	343,673	93%	$1,021,981	$1,021,981	22	15,622	$46,454	$46,454
	Other	1,109	0%	$3,600	$3,600	7	158	$514	$514
	Total	369,556		$1,097,989	$1,097,989	51	7,246	$21,529	$21,529

*confidential – data are combined with the “Longline” category
Source: NMFS Logbooks, October 19, 2011.

3.3.1.3 Vessels, Harvest, and Revenue by State (1993-2010)

Table 3-8 shows golden tilefish landings by state from 1993 through 2010. Landings from Georgia are combined with Florida because in many years there were no landings from Georgia. Landings from Georgia are confidential in nearly all years in which they occurred. In every year in the time series, except 1993 and 2004, Florida had more landings than all the other states combined. The highest concentration of landings percentages have been in Florida since 2007. In each of the last four years of the time series, Florida landed at least 86% of the entire golden tilefish quota.

Since 2007, the negative economic impacts of shortened seasons are proportionately less on Florida compared to other states. In fact, more fish are caught in Florida the shorter the season. The quota has remained the same for the past several years while the stock has been rebuilding. Consequently, the fact that there are more fish means the fish are caught more quickly in the season. Golden tilefish are more plentiful further north in their range in late summer and fall. When the golden tilefish portion of the snapper grouper fishery closes earlier in the calendar year as has been happening in recent years, vessels from the Carolinas did not land proportionally as much fish as in previous years unless they are willing to migrate south to participate in the fishery off the east coast of Florida when it occurs there when the fishery opens each year in January.

Table 3-8. Golden tilefish sector statistics by state, 1993-2010.

Year	State	Lbs Golden Tilefish	Percent of Total GT Landings	GT Revenue (nominal $)	GT Revenue (2010 $)	Participating Vessels	Avg. Annual lbs (gw) by State	Avg. Annual Revenue by State (nominal $)	Avg. Annual Revenue by State (2010 $)
1993	NC	100,037	8%	$166,163	$250,747	18	5,558	$9,231	$13,930
	SC	127,144	11%	$175,521	$264,867	21	6,054	$8,358	$12,613
	GA/FL-East	586,591	49%	$863,121	$1,302,482	60	9,777	$14,385	$21,708
	Other	376,580	32%	$542,447	$818,573	24	15,691	$22,602	$34,107
	Total	1,190,353		$1,747,252	$2,636,670	107	11,125	$16,329	$24,642
1994	NC	120,723	16%	$238,652	$351,144	22	5,487	$10,848	$15,961
	SC	145,879	19%	$227,819	$335,204	10	14,588	$22,782	$33,520
	GA/FL-East	421,528	56%	$698,187	$1,027,287	60	7,025	$11,636	$17,121
	Other	63,519	8%	$101,663	$149,583	16	3,970	$6,354	$9,349
	Total	751,649		$1,266,321	$1,863,218	99	7,592	$12,791	$18,820
1995	NC	72,420	12%	$136,087	$194,716	28	2,586	$4,860	$6,954
	SC	140,636	23%	$233,166	$333,618	11	12,785	$21,197	$30,329
	GA/FL-East	409,180	66%	$723,450	$1,035,122	57	7,179	$12,692	$18,160
	Other	812	0%	$1,210	$1,732	14	58	$86	$124
	Total	623,048		$1,093,914	$1,565,187	102	6,108	$10,725	$16,184
1996	NC	53,762	15%	$128,220	$178,198	18	2,987	$7,123	$9,900
	SC	64,579	18%	$85,054	$118,206	11	5,871	$7,732	$10,746
	GA/FL-East	194,913	53%	$396,414	$550,927	49	3,978	$8,090	$11,243
	Other	52,293	14%	$97,713	$135,799	26	2,011	$3,758	$5,223

	Total	365,547		$707,401	$983,129	96	3,808	$7,369	$10,241
1997	NC	35,774	10%	$80,576	$109,471	18	1,987	$4,476	$6,082
	SC	112,019	32%	$128,247	$174,236	12	9,335	$10,687	$14,520
	GA/FL-East	195,538	56%	$360,597	$489,908	50	3,911	$7,212	$9,798
	Other	3,634	1%	$4,718	$6,410	23	158	$205	$279
	Total	346,966		$574,138	$780,026	91	3,813	$6,309	$8,572
1998	NC	17,861	4%	$41,670	$55,745	16	1,116	$2,604	$3,484
	SC	101,498	24%	$165,725	$221,701	11	9,227	$15,066	$20,155
	GA/FL-East	241,860	58%	$457,050	$611,426	44	5,497	$10,387	$13,896
	Other	58,403	14%	$99,096	$132,568	19	3,074	$5,216	$6,977
	Total	419,622		$763,541	$1,021,439	84	4,995	$9,090	$12,160
1999	NC	5,021	1%	$10,580	$13,848	15	335	$705	$923
	SC	103,666	20%	$193,600	$253,395	9	11,518	$21,511	$28,155
	GA/FL-East	372,019	71%	$745,325	$975,525	47	7,915	$15,858	$20,756
	Other	39,944	8%	$69,544	$91,023	24	1,664	$2,898	$3,793
	Total	520,650		$1,019,049	$1,333,792	84	6,198	$12,132	$15,878
2000	NC	16,481	2%	$49,742	$62,988	13	1,268	$3,826	$4,845
	SC	134,142	19%	$247,132	$312,942	6	22,357	$41,189	$52,157
	GA/FL-East	529,985	75%	$1,124,114	$1,423,460	58	9,138	$19,381	$24,542
	Other	25,764	4%	$46,830	$59,300	29	888	$1,615	$2,045
	Total	706,373		$1,467,817	$1,858,690	97	7,282	$15,132	$19,162
2001	NC	16,574	4%	$31,185	$38,397	12	1,381	$2,599	$3,200
	SC	121,440	28%	$222,640	$274,128	7	17,349	$31,806	$39,161
	GA/FL-East	270,355	62%	$561,346	$691,163	50	5,407	$11,227	$13,823
	Other	29,336	7%	$51,966	$63,983	29	1,012	$1,792	$2,206

	Total	437,705		$867,138	$1,067,671	87	5,031	$9,967	$12,272
2002	NC	2,637	1%	$6,098	$7,508	14	188	$436	$528
	SC	156,879	40%	$285,292	$351,269	7	22,411	$40,756	$49,400
	GA/FL-East	207,892	53%	$453,433	$558,293	47	4,423	$9,648	$11,694
	Other	26,375	7%	$47,477	$58,457	27	977	$1,758	$2,131
	Total	393,783		$792,300	$975,527	86	4,579	$9,213	$11,167
2003	NC	14,764	5%	$40,600	$48,115	11	1,342	$3,691	$4,374
	SC	114,368	37%	$208,494	$247,084	10	11,437	$20,849	$24,708
	GA/FL-East	170,143	55%	$358,720	$425,115	29	5,867	$12,370	$14,659
	Other	10,576	3%	$19,731	$23,383	23	460	$858	$1,017
	Total	309,851		$627,546	$743,696	65	4,767	$9,655	$11,441
2004	NC	35,929	13%	$94,190	$108,728	6	5,988	$15,698	$18,121
	SC	93,357	33%	$170,761	$197,117	8	11,670	$21,345	$24,640
	GA/FL-East	112,661	40%	$243,286	$280,837	42	2,682	$5,793	$6,687
	Other	37,537	13%	$64,361	$74,295	17	2,208	$3,786	$4,370
	Total	279,485		$572,598	$660,977	67	4,171	$8,546	$9,865
2005	NC	688	0%	$1,227	$1,243	12	57	$102	$114
	SC	55,652	17%	$118,732	$120,250	8	6,957	$14,842	$16,571
	GA/FL-East	203,836	63%	$514,703	$521,285	41	4,972	$12,554	$14,016
	Other	63,951	20%	$134,031	$135,745	15	4,263	$8,935	$9,977
	Total	324,127		$768,694	$778,523	66	4,911	$11,647	$13,004
2006	NC	1,840	1%	$3,988	$4,313	9	204	$443	$479
	SC	109,290	30%	$243,853	$263,758	8	13,661	$30,482	$32,970
	GA/FL-East	253,010	69%	$640,610	$692,901	34	7,441	$18,841	$20,379
	Other	2,834	1%	$5,706	$6,172	16	177	$357	$386

	Total	366,974		$894,157	$967,145	61	6,016	$14,658	$15,855
2007	NC	1,383	0%	$3,904	$4,106	6	231	$651	$684
	SC	24,295	9%	$50,957	$53,590	4	6,074	$12,739	$13,398
	GA/FL-East	258,406	91%	$706,808	$743,331	46	5,618	$15,365	$16,159
	Other	1,347	0%	$3,141	$3,303	16	84	$196	$206
	Total	285,431		$764,811	$804,331	67	4,260	$11,415	$12,005
2008	NC	5,665	2%	$6,883	$6,971	7	809	$983	$996
	SC	17,427	6%	$38,326	$38,817	4	4,357	$9,582	$9,704
	GA/FL-East	276,322	92%	$722,068	$731,301	40	6,908	$18,052	$18,283
	Other	827	0%	$1,836	$1,860	11	75	$167	$169
	Total	300,241		$769,115	$778,949	57	5,267	$13,493	$13,666
2009	NC	1,972	1%	$6,030	$6,129	5	394	$1,206	$1,226
	SC	22,796	7%	$50,293	$51,118	4	5,699	$12,573	$12,780
	GA/FL-East	279,723	89%	$689,712	$701,025	39	7,172	$17,685	$17,975
	Other	8,820	3%	$24,136	$24,532	7	1,260	$3,448	$3,505
	Total	313,311		$770,172	$782,805	49	6,394	$15,718	$15,976
2010	NC	5,688	2%	$15,446	$15,446	4	1,422	$3,862	$3,862
	SC	28,331	8%	$79,101	$79,101	6	4,722	$13,183	$13,183
	GA/FL-East	318,118	86%	$961,283	$961,283	41	7,759	$23,446	$23,446
	Other	17,420	5%	$42,159	$42,159	6	2,903	$7,026	$7,026
	Total	369,556		$1,097,989	$1,097,989	51	7,246	$21,529	$21,529

Source: NMFS Logbooks, October 19, 2011.

Economic Activity

The commercial economic impacts associated with the harvesting of golden tilefish by U.S. commercial fishing vessels and the activities of the seafood and retail industries that depend on fish and seafood products can be estimated. These impacts are expressed in terms of employment (full-time and part-time jobs), personal income, and output (sales by U.S. businesses). Using 2010 values, the harvesting sector accounted for 27 jobs, and $1,097,000 in income. When harvester data are combined with all aspects of the seafood industry (retail, restaurants, etc.) related to golden tilefish harvest, the values increase to 210 jobs, $6,161,000 in income, and $14,457,000 in output (Table 3-9).

Table 3-9. Impacts are expressed in terms of employment (full-time and part-time jobs), personal income, and output (sales by U.S. businesses).

Species	Average Revenue (millions)1	Total Jobs	Harvester Jobs	Output (Sales) Impacts (millions)1	Income Impacts (millions)1
Golden Tilefish	$1.097	210	27	$14.457	$6.161

12010 dollars
Source: NMFS SERO

Economic Description of the Recreational Fishery

Additional information on the recreational sector of the snapper grouper fishery contained in previous or concurrent amendments is incorporated herein by reference [see Amendment 13C (SAFMC 2006), Amendment 15A (SAFMC 2008a), Amendment 15B (SAFMC 2008b), Amendment 16 (SAFMC 2009a), Amendment 17A (SAFMC 2010a), Amendment 17B (SAFMC 2010b), Regulatory Amendment 9 (SAFMC 2011b), Comprehensive ACL Amendment for the South Atlantic Region (under review), Amendment 24 (under review)]. The following description of the recreational sector focuses on golden tilefish as this is the main species considered in this amendment.

The recreational sector is comprised of the private sector and for-hire sector. The private sector includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire sector is composed of the charterboat and headboat (also called partyboat) sectors. Charterboats generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person.

Harvest

Recreational golden tilefish harvest in the South Atlantic was variable during the period 2005-2010. For this period, only Florida and North Carolina reported some harvest of the species, although there were years when no harvests were reported by these two states. On average, the

private/shore mode of fishing accounted for the largest harvests at approximately 22,000 pounds (whole weight), or 5,000 fish (Table 3-10). Average charter harvests were approximately 41,000 pounds (whole weight), or 11,000 fish. Headboats did not report any harvests of the species for the period.

Recreational harvests of golden tilefish also fluctuated from year to year for the period 2005-2010. On average, North Carolina accounted for most of the golden tilefish harvest in the South Atlantic at approximately 47,000 pounds whole weight, or 14,000 fish (Table 3-11). Florida accounted for harvests of approximately 17,000 pounds whole weight, or 3,000 fish. Georgia and South Carolina reported no harvest of the species during the period.

Table 3-10. Average harvest (whole weight) of golden tilefish in the South Atlantic, by mode, 2005-2010.

Harvest Type	Charterboat	Headboat	Shore and Private/Rental Boat	Total
Pounds (WW)	41,681	0	22,211	63,892
No. of Fish	11,444	0	4,842	16,286

Table 3-11. Average harvest (whole weight) of golden tilefish in the South Atlantic, by state, 2005-2010.

Harvest Type	Florida	Georgia	South Carolina	North Carolina
Pounds (WW)	17,106	0	0	46,786
No. of Fish	2,675	0	0	13,611

Source: The Headboat Survey, NOAA Fisheries, SEFSC, Beaufort Lab and MRFSS database, NOAA Fisheries, NMFS, SERO.

On average, overall harvest of golden tilefish peaked in June-July and troughed in January-February (Table 3-12). May and June were the peak months for charterboat harvests of golden tilefish harvest while July and August were the peak months for golden tilefish harvest by the shore/private mode. The lowest harvest occurred in January/February and November/December for charterboats and May/June for the shore/private mode.

There are observable differences between Florida and North Carolina on the specific months with recorded highest and lowest harvest of golden tilefish (Table 3-13). North Carolina had the highest harvest in July/August and lowest in January/February and November/December. Florida had its highest harvest in November/December and lowest in May/June.

Table 3-12. Average monthly distribution of golden tilefish harvest in the South Atlantic, by mode across all states, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Pounds (Whole Weight)											
Charter	0	0	467	467	10,072	10,072	9,428	9,428	873	873	0	0
Headboat	0	0	0	0	0	0	0	0	0	0	0	0
Shore/Priv.	585	585	1,672	1,672	399	399	4,012	4,012	1,547	1,547	2,891	2,891
Total	585	585	2,140	2,140	10,471	10,471	13,440	13,440	2,420	2,420	2,891	2,891
	Number of Fish											
Charter	0	0	93	93	2,940	2,940	2,425	2,425	265	265	0	0
Headboat	0	0	0	0	0	0	0	0	0	0	0	0
Shore/Priv.	143	143	130	130	79	79	1,309	1,309	172	172	588	588
Total	143	143	223	223	3,018	3,018	3,734	3,734	437	437	588	588

Table 3-13. Average monthly distribution of golden tilefish harvest in the South Atlantic, by state across all modes, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Pounds (Whole Weight)											
NC	0	0	467	467	9,947	9,947	12,106	12,106	873	873	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
GA	0	0	0	0	0	0	0	0	0	0	0	0
FL	585	585	1,672	1,672	524	524	1,335	1,335	1,547	1,547	2,891	2,891
TOTAL	585	585	2,140	2,140	10,471	10,471	13,440	13,440	2,420	2,420	2,891	2,891
	Number of Fish											
NC	0	0	93	93	2,903	2,903	3,544	3,544	265	265	0	0

SC	0	0	0	0	0	0	0	0	0	0	0	0
GA	0	0	0	0	0	0	0	0	0	0	0	0
FL	143	143	130	130	115	115	189	189	172	172	588	588
TOTAL	143	143	223	223	3,018	3,018	3,734	3,734	437	437	588	588

Effort

Recreational effort derived from the MRFSS database can be characterized in terms of the number of trips as follows:

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

Estimates of annual golden tilefish recreational effort in terms of target and catch trips are provided in Tables 3-14 through 3-17. Noticeable in these tables is the low levels of target and catch trips for golden tilefish. In addition, target trips are significantly lower than catch trips. While some angler trips recorded harvest of golden tilefish, much fewer angler trips recorded golden tilefish as a target species.

The private/rental mode recorded higher target and catch trips than the charter mode (Table 3-14), although both types of trips are relatively low which is consistent with the relatively low harvest of golden tilefish. Moreover, Florida recorded higher target and catch trips than North Carolina (Table 3-15). This effort distribution does not quite match with the harvest distribution described earlier. The shore mode did not report any target or catch trips.

Table 3-14. Average recreational effort (trips) for golden tilefish in the South Atlantic, by mode across all states, 2005-2010.

Type of Trips	Charterboat	Private/Rental Boat	Shore	Total
Target Trips	105	1,635	0	1,740
Catch Trips	1,975	2,719	0	4,694

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

Table 3-15. Recreational effort (trips) for golden tilefish in the South Atlantic, by state across all modes, 2005-2010.

Type of Trips	Florida	Georgia	South Carolina	North Carolina
Target Trips	1,595	0	0	145
Catch Trips	2,432	0	0	2,262

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

On average, target trips and catch trips for golden tilefish peaked in November/December (Table 3-16). There were no target trips in July/August. Catch trips had their lowest level in February. Very low levels of charter target trips were recorded, with non-zero entries only in May/June and September/October. Although private target trips were higher than charter target trips, they were still relatively low and in fact were zero in May/June and July/August. A good portion of private target trips occurred in November/December. There were no charter catch trips in January/February and November/December, with most of the trips occurring in the summer months. Private catch trips were distributed throughout the year with relatively high levels in November/December and low levels in May/June.

The very low level of target trips in North Carolina took place only in May/June and September/October (Table 3-16). Target trips in Florida were substantially higher in November/December than in other months; there were no target trips in May through August. Catch trips in North Carolina were substantially higher in July/August than in other months; there were no catch trips in January/February and November/December. Catch trips in Florida were spread throughout the year, with peaks in November/December and troughs in July/August.

Table 3-16. Average monthly distribution of recreational effort (trips) for golden tilefish in the South Atlantic, by mode across all states, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Target Trips												
Charter	0	0	0	0	35	34	0	0	18	19	0	0
Private	113	102	95	92	0	0	0	0	58	60	549	567
Shore	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	113	102	95	92	35	34	0	0	76	79	549	567
Catch Trips												
Charter	0	0	19	19	425	411	496	496	54	56	0	0
Private	158	142	134	130	80	77	275	275	131	135	581	600
Shore	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	158	142	154	149	505	488	771	771	184	190	581	600

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

Table 3-17. Average monthly distribution of recreational effort (trips) for golden tilefish in the South Atlantic, by state across all modes, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Target Trips												
NC	0	0	0	0	35	34	0	0	37	39	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
GA	0	0	0	0	0	0	0	0	0	0	0	0
FL	113	102	95	92	0	0	0	0	39	40	549	567
TOTAL	113	102	95	92	35	34	0	0	76	79	549	567
Catch Trips												
NC	0	0	19	19	364	353	699	699	54	56	0	0
SC	0	0	0	0	0	0	0	0	0	0	0	0
GA	0	0	0	0	0	0	0	0	0	0	0	0
FL	158	142	134	130	140	136	72	72	131	135	581	600
TOTAL	158	142	154	149	505	488	771	771	184	190	581	600

Source: MRFSS, NOAA Fisheries, NMFS, SERO.

Similar analysis of recreational effort is not possible for the headboat sector because the headboat data are not collected at the angler level. Estimates of effort in the headboat sector are provided in terms of angler days, or the number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. Table 3-18 displays the annual angler days and Table 3-19 displays their average monthly distribution. Confidentiality issues required combining Georgia estimates with those of Northeast Florida.

Headboat angler days varied from year to year but generally declined since 2007 (Table 3-18). Southeast Florida registered the highest number of angler trips, followed by Georgia/Northeast Florida, South Carolina, and North Carolina. Clearly Florida dominated all other states in terms of headboat angler days.

On average, overall angler days peaked in June and troughed in December (Table 3-19). North Carolina and South Carolina had similar peaks and troughs as the overall average. Angler days in Georgia/Northeast Florida peaked in June and troughed in November while those in Southeast Florida peaked in April and troughed in September.

Table 3-18. South Atlantic headboat angler days, by state, 2005-2010.

	NC	SC	GA/NEFL	SEFL	TOTAL
2005	40,916	52,036	74,663	82,870	250,485
2006	25,736	56,074	48,908	126,614	257,332
2007	29,002	60,729	53,762	103,388	246,881
2008	16,982	47,287	52,521	71,598	188,388

2009	19,468	40,919	66,447	69,973	196,807
2010	21,071	44,951	53,676	69,986	189,684
Average	25,529	50,333	58,330	87,405	221,596

Source: The Headboat Survey, NOAA Fisheries, SEFSC, Beaufort Lab.

Table 3-24. Average monthly distribution of headboat angler days in the South Atlantic, by state, 2005-2010.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NC	220	194	813	1,647	2,740	4,640	5,118	4,440	2,309	2,273	1,062	75
SC	153	272	1,828	3,791	5,201	9,772	12,245	8,949	3,603	3,031	1,337	153
GA/NEFL	2,668	3,423	5,672	6,380	6,056	8,402	8,229	5,688	3,175	3,173	2,637	2,826
SEFL	7,432	8,517	9,647	9,764	7,962	8,635	9,609	7,006	4,112	4,135	4,829	5,758
TOTAL	10,473	12,405	17,960	21,582	21,958	31,449	35,202	26,082	13,199	12,612	9,864	8,811

Source: The Headboat Survey, NOAA Fisheries, SEFSC, Beaufort Lab.

Permits

For-hire vessels are required to have a for-hire snapper grouper permit to fish for or possess snapper grouper species in the South Atlantic EEZ. The number of vessels with for-hire snapper grouper permits for the period 2005-2010 is provided in Table 3-25. This sector operates as an open access fishery and not all permitted vessels are necessarily active in the fishery. Some vessel owners obtain open access permits as insurance for uncertainties in the fisheries in which they currently operate.

The number of for-hire permits issued for the South Atlantic snapper grouper fishery increased from 1,904 permits in 2005 to 2,104 permits in 2008, but subsequently decreased to 2,091 in 2009 and 1,815 in 2010. The majority of snapper grouper for-hire permitted vessels were home-ported in Florida; a relatively high proportion of these permitted vessels were also home-ported in North Carolina and South Carolina. Many vessels with South Atlantic for-hire snapper-grouper permits were homeported in states outside of SAFMC's area of jurisdiction, particularly in the Gulf states of Alabama through Texas. Although the number of vessels with South Atlantic for-hire snapper grouper permits homeported in states outside of SAFMC's area of jurisdiction increased from 2005 to 2009, they still accounted for approximately the same proportion (9-10%) of the total number of permits. For-hire snapper-grouper permits in these other areas fell in 2010.

Table 3-25. Number of South Atlantic for-hire snapper-grouper vessel permits, 2005-2010.

HomePort State	2005	2006	2007	2008	2009		Avg.

						2010	
North Carolina	294	317	353	399	391	333	348
South Carolina	136	142	152	160	167	147	151
Georgia	37	36	37	35	36	28	35
Florida	1,267	1,304	1,312	1,310	1,280	1,110	1,264
Gulf States (AL-TX)	102	84	79	84	87	84	87
Other States	68	84	93	116	130	113	101
Total	1,904	1,967	2,026	2,104	2,091	1,815	1,985

For hire permits do not distinguish charterboats from headboats. Based on a 1997 survey, Holland et al. (1999) estimated that a total of 1,080 charter vessels and 96 headboats supplied for-hire services in all South Atlantic fisheries during 1997. By 2010, the estimated number of headboats supplying for-hire services in all South Atlantic fisheries had fallen to 85, indicating a decrease in fleet size of approximately 11% between 1997 and 2010 (K. Brennan, Beaufort Laboratory, SEFSC, personal communication, Feb. 2011).

There are no specific permitting requirements for recreational anglers to harvest snapper grouper. Instead, anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions.

Economic Value and Expenditures

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

While anglers receive economic value as measured by the consumer surplus associated with fishing, for-hire businesses receive value from the services they provide. Producer surplus is the measure of the economic value these operations receive. Producer surplus is the difference between the revenue a business receives for a good or service, such as a charter or headboat trip, and the cost the business incurs to provide that good or service. Estimates of the producer surplus associated with for-hire trips are not available. However, proxy values in the form of net operating revenues are available (David Carter, NMFS SEFSC, personal communication, August 2010). These estimates were culled from several studies – Liese et al. (2009), Dumas et al. (2009), Holland et al. (1999), and Sutton et al. (1999). Estimates of net operating revenue per angler trip (2009 dollars) on representative charter trips (average charter trip regardless of area fished) are $146 for Louisiana through east Florida, $135 for east Florida, $156 for northeast Florida, and $128 for North Carolina. For charter trips into the EEZ only, net operating revenues are $141 in east Florida and $148 in northeast Florida. For full-day and overnight trips only, net

operating revenues are estimated to be $155-$160 in North Carolina. Comparable estimates are not available for Georgia, South Carolina, or Texas.

Net operating revenues per angler trip are lower for headboats than for charterboats. Net operating revenue estimates for a representative headboat trip are $48 in the Gulf of Mexico (all states and all of Florida), and $63-$68 in North Carolina. For full-day and overnight headboat trips, net operating revenues are estimated to be $74-$77 in North Carolina. Comparable estimates are not available for Georgia and South Carolina.

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

Estimates of the economic activity (impacts) associated with recreational fishing for any species could be derived using average coefficients for recreational angling across all fisheries (species), as derived by an economic add-on to the MRFSS, and described and utilized in NMFS (2009). Business activity is characterized in the form of FTE jobs, income impacts (wages, salaries, and self-employed income), output (sales) impacts (gross business sales), and value-added impacts (difference between the value of goods and the cost of materials or supplies). Job and output (sales) impacts are equivalent metrics across both the commercial and recreational sectors. Income and value-added impacts are not equivalent, though similarity in the magnitude of multipliers may result in roughly equivalent values. Neither income nor value-added impacts should be added to output (sales) impacts because this would result in double counting. Job and output (sales) impacts, however, may be added across sectors.

The current model to derive business activity is based on the number of recreational trips for a species. Because these trips for golden tilefish are relatively sparse (see Tables 3-19 through 3-22), estimates of economic activity generated by the recreational sector for the golden tilefish portion of the snapper grouper fishery reflect such sparse data. Estimates of the average golden tilefish recreational effort (2005-2010) and associated economic impacts (2008 dollars) are provided in Table 3-26. Target trips were used as the measure of recreational effort. As previously discussed, more trips may catch a species than target the species. Where such occurs, estimates of the economic activity associated with the average number of catch trips can be calculated based on the ratio of catch trips to target trips because the average output impact and jobs per trip cannot be differentiated by trip intent.

It should be noted that output impacts and value added impacts are not additive and the impacts for individual species should not be added because of possible duplication (some trips may target multiple species). Also, the estimates of economic activity should not be added across states to generate a regional total because state-level impacts reflect the economic activity expected to occur within the state before the revenues or expenditures “leak” outside the state,

possibly to another state within the region. Under a regional model, economic activity that "leaks" from, for example, Florida into Georgia would still occur within the region and continue to be tabulated. As a result, regional totals would be expected to be greater than the sum of the individual state totals. Regional estimates of the economic activity associated with golden tilefish recreational fishing are unavailable at this time.

Table 3-26. Summary of golden tilefish target trips (2005-2010 average) and associated economic activity (2008 dollars). Output and value added impacts are not additive.

	North Carolina	South Carolina	Georgia	East Florida
	Shore Mode			
Target Trips	0	0	0	0
Output Impact	$0	$0	$0	$0
Value Added Impact	$0	$0	$0	$0
Jobs	0	0	0	0
	Private/Rental Mode			
Target Trips	40	0	0	1595
Output Impact	$2,183	$0	$0	$60,315
Value Added Impact	$1,231	$0	$0	$36,042
Jobs	0	0	0	1
	Charter Mode			
Target Trips	105	0	0	0
Output Impact	$40,875	$0	$0	$0
Value Added Impact	$22,939	$0	$0	$0
Jobs	1	0	0	0
	All Modes			
Target Trips	145	0	0	1595
Output Impact	$43,058	$0	$0	$60,315
Value Added Impact	$24,170	$0	$0	$36,042
Jobs	1	0	0	1

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

Because the headboat sector in the Southeast is not covered by the MRFSS, the current model used in deriving estimates could not provide this sector's estimates of economic activity. In the particular case of golden tilefish, estimating economic activity of the headboat sector is also unnecessary because this sector did not report any landings of the species during the period considered.

Financial Operations of the Charter and Headboat Sectors

Holland et al. (1999) estimated that the charterboat fee in the South Atlantic ranged from $292 to $2,000. The actual cost depended on state, trip length, and the variety of services offered by the charter operation. Depending on the state, the average fee for a half-day trip ranged from $296 to $360, for a full day trip the range was $575 to $710, and for an overnight trip the range was $1,000 to $2,000. Most (>90%) Florida charter operators offered half-day and full-day trips and about 15% of the fleet offered overnight trips. In comparison, only about 3% of operations in the other South Atlantic states offered overnight trips.

For headboats, the average fee in Florida was $29 for a half-day trip and $45 for a full day trip. For North and South Carolina, the average base fee was $34 per person for a half-day trip and $61 per person for a full day trip. Most of these headboat trips operated in Federal waters in the South Atlantic (Holland et al. 1999).

Capital investment in charter vessels averaged $109,301 in Florida, $79,868 for North Carolina, $38,150 for South Carolina and $51,554 for Georgia (Holland et al. 1999). Charterboat owners incur expenses for inputs such as fuel, ice, and tackle in order to offer the services required by their passengers. Most expenses incurred in 1997 by charter vessel owners were on crew wages and salaries and fuel. The average annual charterboat business expenditures incurred was $68,816 for Florida vessels, $46,888 for North Carolina vessels, $23,235 for South Carolina vessels, and $41,688 for vessels in Georgia in 1997. The average capital investment for headboats in the South Atlantic was approximately $220,000 in 1997. Total annual business expenditures averaged $135,737 for headboats in Florida and $105,045 for headboats in other states in the South Atlantic.

The 1999 study on the for-hire sector in the Southeastern U.S. presented two sets of average gross revenue estimates for the charter and headboat sectors in the South Atlantic (Holland et al., 1999). The first set of estimates were those reported by survey respondents and were as follows: $51,000 for charterboats on the Atlantic coast of Florida; $60,135 for charterboats in North Carolina; $26,304 for charterboats in South Carolina; $56,551 for charterboats in Georgia; $140,714 for headboats in Florida; and $123,000 for headboats in the other South Atlantic states (Holland et al., 1999). The authors generated a second set of estimates using the reported average trip fee, average number of trips per year, and average number of passengers per trip (for the headboat sector) for each vessel category for Florida vessels. Using this method, the resultant average gross revenue figures were $69,268 for charterboats and $299,551 for headboats. Since the calculated estimates were considerably higher than the reported estimates (22% higher for charterboats and 113% higher for headboats), the authors surmised that this was due to sensitivity associated with reporting gross receipts, and subsequent under reporting. Alternatively, the respondents could have overestimated individual components of the calculated estimates. Although the authors only applied this methodology to Florida vessels, assuming the same degree of under reporting in the other states results in the following estimates in average gross revenues: $73,365 for charterboats in North Carolina, $32,091 for charterboats in South

Carolina; $68,992 for charterboats in Georgia; and $261,990 for headboats in the other South Atlantic states.

It should be noted that the study's authors were concerned that while the reported gross revenue figures may be underestimates of true vessel income, the calculated values could overestimate gross income per vessel from for-hire activity (Holland et al., 1999). Some of these vessels are also used in commercial fishing activities and that income is not reflected in these estimates.

A more recent study of the North Carolina for-hire fishery provides some updated information on the financial status of the for-hire fishery in the state (Dumas et al., 2009). Depending on vessel length, regional location, and season, charter fees per passenger per trip ranged from $168.14 to $251.59 for a full-day trip and from $93.63 to $123.95 for a half-day trip; headboat fees ranged from $72.50 to $81.78 for a full-day trip and from $38.08 to $45 for a half-day trip. Charterboats generated a total of $55.7 million in passenger fees, $3.2 million in other vessel income (e.g., food and beverages), and $4.8 million in tips. The corresponding figures for headboats were $9.8 million in passenger fees, $0.2 million in other vessel income, and $0.9 million in tips. Non-labor expenditures (e.g., boat insurance, dockage fees, bait, ice, fuel) amounted to $43.6 million for charterboats and $5.3 million for headboats. Summing across vessel lengths and regions, charter vessels had an aggregate value (depreciated) of $120.4 million and headboats had an aggregate value (depreciated) of $10.2 million.

Appendix E. History of Management

History of Management of the South Atlantic Snapper Grouper Fishery

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

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
FMP (1983)	08/31/83	PR: 48 FR 26843 FR: 48 FR 39463	-12" 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 lbs s-g on board. -Established rebuttable assumption that vessel with s-g on board had harvested such fish in EEZ.
Regulatory Amendment #2 (1988b)	03/30/89	PR: 53 FR 32412 FR: 54 FR 8342	-Established 2 artificial reefs off Ft. Pierce, FL as SMZs.
Notice of Control Date	09/24/90	55 FR 39039	-Anyone entering federal wreckfish fishery in the EEZ off 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.
Amendment #2 (1990)	10/30/90	PR: 55 FR 31406 FR: 55 FR 46213	-Prohibited harvest/possession of goliath grouper in or from the EEZ -Defined overfishing for goliath grouper and other species

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Emergency Rule	8/3/90	55 FR 32257	-Added wreckfish to the FMU -Fishing year beginning 4/16/90 -Commercial quota of 2 million pounds -Commercial trip limit of 10,000 pounds per trip
Fishery Closure Notice	8/8/90	55 FR 32635	- Fishery closed because the commercial quota of 2 million pounds was reached
Emergency Rule Extension	11/1/90	55 FR 40181	-extended the measures implemented via emergency rule on 8/3/90
Amendment #3 (1990b)	01/31/91	PR: 55 FR 39023 FR: 56 FR 2443	-Added wreckfish to the FMU; -Defined optimum yield and overfishing -Required permit to fish for, land or sell wreckfish; -Required catch and effort reports from selected, permitted vessels; -Established control date of 03/28/90; -Established a fishing year for wreckfish starting April 16; -Established a process to set annual quota, with initial quota of 2 million pounds; provisions for closure; -Established 10,000 pound trip limit; -Established a spawning season closure for wreckfish from January 15 to April 15; and -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.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #4 (1991)	01/01/92	PR: 56 FR 29922 FR: 56 FR 56016	-Prohibited gear: fish traps except black sea bass 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" limit – lane snapper -10" limit – vermilion snapper (recreational only) -12" limit – red porgy, vermilion snapper (commercial only), gray, yellowtail, mutton, schoolmaster, queen, blackfin, cubera, dog, mahogany, and silk snappers -20" limit – red snapper, gag, and red, black, scamp, yellowfin, and yellowmouth groupers. -28" FL limit – greater amberjack (recreational only) -36" FL or 28" core length – greater amberjack (commercial only) -bag limits – 10 vermilion snapper, 3 greater amberjack -aggregate snapper bag limit – 10/person/day, excluding vermilion snapper and allowing no more than 2 red snappers -aggregate grouper bag limit – 5/person/day, excluding Nassau and goliath grouper, for which no retention (recreational & commercial) is allowed -spawning season closure – commercial harvest greater amberjack > 3 fish bag prohibited in April south of Cape Canaveral, FL -spawning season closure – commercial harvest mutton snapper >snapper aggregate prohibited during May and June -charter/headboats and excursion boat possession limits extended

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #5 (1992a)	04/06/92	PR: 56 FR 57302 FR: 57 FR 7886	-Wreckfish: established limited entry system with ITQs; required dealer to have permit; rescinded 10,000 lb. trip limit; required off-loading between 8 am and 5 pm; reduced occasions when 24-hour advance notice of offloading required for off-loading; established procedure for initial distribution of percentage shares of TAC
Emergency Rule	8/31/92	57 FR 39365	-Black Sea Bass (bsb): modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Emergency Rule Extension	11/30/92	57 FR 56522	-Black Sea Bass: modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Regulatory Amendment #4 (1992b)	07/06/93	FR: 58 FR 36155	-Black Sea Bass: modified definition of bsb pot; allowed multi-gear trips for bsb; allowed retention of incidentally-caught fish on bsb trips
Regulatory Amendment #5 (1992c)	07/31/93	PR: 58 FR 13732 FR: 58 FR 35895	-Established 8 SMZs off S. 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 Total Allowable Catch (TAC) levels for golden tilefish and snowy grouper -established commercial trip limits for snowy grouper, golden tilefish, speckled hind, and warsaw grouper -included golden tilefish in grouper recreational aggregate bag limits -prohibited sale of warsaw grouper and speckled hind -100% logbook coverage upon renewal of permit -creation of the *Oculina* Experimental Closed Area -data collection needs specified for evaluation of possible future IFQ 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 N. Carolina -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 (1994)	05/22/95	PR: 60 FR 8620 FR: 60 FR 19683	Established actions which applied only to EEZ off Atlantic coast of FL: Bag limits – 5 hogfish/person/day (recreational only), 2 cubera snapper/person/day > 30" TL; 12" TL – gray triggerfish
Notice of Control Date	04/23/97	62 FR 22995	-Anyone entering federal bsb pot fishery off S. Atlantic states after 04/23/97 was not assured of future access if

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

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Amendment #9 (1998b)	2/24/99	PR: 63 FR 63276 FR: 64 FR 3624	-Red porgy: 14" length (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" length (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 lbs; began fishing year May 1; prohibited coring. -Vermilion snapper: 11" length (recreational) Gag: 24" length (recreational); no commercial harvest or possession > bag limit, and no purchase or sale, during March and April -Black grouper: 24" length (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 SG without a bag limit: aggregate recreational bag limit 20 fish/person/day, excluding tomtate and blue runners -Vessels with longline gear aboard may only possess snowy, warsaw, yellowedge, and misty grouper, and golden, blueline and sand tilefish.
Amendment #9 (1998b) resubmitted	10/13/00	PR: 63 FR 63276 FR: 65 FR 55203	-Commercial trip limit for greater amberjack
Regulatory Amendment #8 (2000a)	11/15/00	PR: 65 FR 41041 FR: 65 FR 61114	-Established 12 SMZs at artificial reefs off Georgia; revised boundaries of 7 existing SMZs off Georgia to meet CG permit specs; restricted fishing in new and revised SMZs
Emergency Interim Rule	09/08/99, expired 08/28/00	64 FR 48324 and 65 FR 10040	-Prohibited harvest or possession of red porgy.
Emergency Action	9/3/99	64 FR 48326	-Reopened the Amendment 8 permit application process
Amendment #10 (1998d)	07/14/00	PR: 64 FR 37082 and 64 FR 59152 FR: 65 FR 37292	-Identified EFH and established HAPCs for species in the SG FMU.

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

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.
			in year 3 onwards. Recreational: Limit possession to one snowy grouper in 5 grouper per person/day aggregate bag limit. 2. Golden Tilefish Commercial: Quota of 295,000 lbs gw, 4,000 lbs gw trip limit until 75% of the quota is taken when the trip limit is reduced to 300 lbs gw. Do not adjust the trip limit downwards unless 75% is captured on or before September 1. Recreational: Limit possession to 1 golden tilefish in 5 grouper per person/day aggregate bag limit. 3. Vermilion Snapper Commercial: Quota of 1,100,000 lbs gw. Recreational: 12" size limit. 4. Black Sea Bass Commercial: Commercial quota (gutted weight) of 477,000 lbs gw in year 1, 423,000 lbs gw in year 2, and 309,000 lbs gw in year 3 onwards. Require use of at least 2" mesh for the entire back panel of black sea bass pots effective 6 months after publication of the final rule. Require black sea bass pots be removed from the water when the quota is met. Change fishing year from calendar year to June 1 – May 31. Recreational: Recreational allocation of 633,000 lbs gw in year 1, 560,000 lbs gw in year 2, and 409,000 lbs gw in year 3 onwards. Increase minimum size limit from 10" to 11" in year 1 and to 12" in year 2. Reduce recreational bag limit from 20 to 15 per person per day. Change fishing year from the calendar year to June 1 through May 31. 5. Red Porgy Commercial and recreational 1. Retain 14" TL size limit and seasonal closure (retention limited to the bag limit); 2. Specify a commercial quota of 127,000 lbs gw and prohibit sale/purchase and prohibit harvest and/or possession beyond the bag limit when quota is taken and/or during January through April; 3. Increase commercial trip limit from 50 lbs ww to 120 red porgy (210 lbs gw) during May through December; 4. Increase recreational bag limit from one to three red porgy per person per day.
Notice of Control Date	3/8/07	72 FR 60794	-The Council may consider measures to limit participation in the snapper grouper for-hire fishery
Amendment #14 (2007) Sent to NMFS 7/18/07	2/12/09	PR: 73 FR 32281 FR: 74 FR 1621	-Establish eight deepwater Type II marine protected areas (MPAs) to protect a portion of the population and habitat of long-lived deepwater snapper grouper species.
Amendment #15A (2008a)	3/14/08	73 FR 14942	- Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.
Amendment #15B (2008b)	2/15/10	PR: 74 FR 30569 FR: 74 FR 58902	- Prohibit the sale of bag-limit caught snapper grouper species.

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.
			-Reduce the effects of incidental hooking on sea turtles and smalltooth sawfish. - Adjust commercial renewal periods and transferability requirements. - Implement plan to monitor and assess bycatch, - Establish reference points for golden tilefish. - Establish allocations for snowy grouper (95% com & 5% rec) and red porgy (50% com & 50% rec).
Amendment #16 (SAFMC 2009a)	7/29/09	PR: 74 FR 6297 FR: 74 FR 30964	-Specify SFA parameters for gag and vermilion snapper -For gag grouper: Specify interim allocations 51%com & 49%rec; rec & com spawning closure January through April; directed com quota=348,440 pounds gutted weight; reduce 5-grouper aggregate to 3-grouper and 2 gag/black to 1 gag/black and exclude captain & crew from possessing bag limit. -For vermilion snapper: Specify interim allocations 68%com & 32%rec; directed com quota split Jan-June=168,501 pounds gutted weight and 155,501 pounds July-Dec; reduce bag limit from 10 to 4 and a rec closed season October through May 15. In addition, the NMFS RA will set new regulations based on new stock assessment. -Require dehooking tools.
Amendment #17A (SAFMC 2010a)	12/3/10 red snapper closure; circle hooks March 3, 2011	PR: 75 FR 49447 FR: 75 FR 76874	-Specify an ACL and an AM for red snapper with management measures to reduce the probability that catches will exceed the stocks' ACL -Specify a rebuilding plan for red snapper -Specify status determination criteria for red snapper -Specify a monitoring program for red snapper
Emergency Rule	12/3/10	75 FR 76890	- Delay the effective date of the area closure for snapper grouper species implemented through Amendment 17A
Amendment #17B (SAFMC 2010b)	January 31, 2011	PR: 75 FR 62488 FR: 75 FR 82280	-Specify ACLs, ACTs, and AMs, where necessary, for 9 species undergoing overfishing. -Modify management measures as needed to limit harvest to the ACL or ACT. -Update the framework procedure for specification of total allowable catch.
Notice of Control Date	12/4/08	74 FR 7849	Establishes a control date for the golden tilefish fishery of the South Atlantic

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
Notice of Control Date	12/4/08	74 FR 7849	- Establishes control date for black sea bass pot fishery of the South Atlantic
Amendment #19 (Comprehensive Ecosystem-based Amendment 1) (SAFMC 2010c)	7/22/10	PR: 75 FR 14548 FR: 75 FR 35330	-Provide presentation of spatial information for Essential Fish Habitat (EFH) and EFH-Habitat Areas of Particular Concern (EFH-HAPC) designations under the Snapper Grouper FMP - Designation of deepwater coral HAPCs
Regulatory Amendment 10 (2011a)	5/31/11	PR: 76 FR 9530 FR: 76 FR 23728	Eliminate closed area for snapper grouper species approved in Amendment 17A.
Regulatory Amendment 9 (2011b)	Bag limit: 6/22/11 Trip limits: 7/15/11	PR: 76 FR 23930 FR: 76 FR 34892	- Establish trip limit for vermilion snapper and gag, increase trip limit for greater amberjack, and reduce bag limit for black sea bass
Regulatory Amendment 11	TBD	TBD	- Eliminate 240 ft closure for six deepwater species.
Amendment #18A (TBD)	TBD	TBD	- Limit participation and effort in the black sea bass fishery - Modifications to management of the black sea bass pot fishery - Improve the accuracy, timing, and quantity of fisheries statistics

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 18B (TBD)	TBD	TBD	-Limit participation and effort in the golden tilefish fishery -Change the golden tilefish fishing year -Modify trip limits - update SFA parameters based on assessment
Amendment #20A	TBD	TBD	-Redistribute latent share for the wreckfish ITQ program.
Amendment #20B	TBD	TBD	-Update wreckfish ITQ according to reauthorized Magnuson-Stevens Act
Amendment #23 (Comprehensive Ecosystem-based Amendment 2)	TBD	TBD	- Designate the Deepwater MPAs as EFH-HAPCs - Limit harvest of snapper grouper species in SC Special Management Zones to the bag limit - Modify sea turtle release gear
Comprehensive ACL Amendment	TBD	TBD	-Establish ABC control rules, establish ABCs, ACLs, and AMs for species not undergoing overfishing -Remove some species from South Atlantic FMU -Specify allocations among the commercial, recreational, and for-hire sectors for species not undergoing overfishing -Limit the total mortality for federally managed species in the South Atlantic to the ACLs
Amendment #24	TBD	TBD	-Specify MSY, rebuilding plan (including ACLs, AMs, and OY), and allocations for red grouper

Appendix F. Bycatch Practicability

Population Effects for the Bycatch Species

Background

Commercial fishing for golden tilefish is prosecuted primarily with longline gear. Approximately 90% of the commercial golden tilefish catch is taken with longline gear with the remain 10% is from hook and line gear (Table 1). During 2006-10, landings of golden tilefish were dominated by the commercial sector (Table 2).

Table 1. Golden tilefish commercial catch by gear based on data from 2005-2010.

2005-10	Gutted Weight	Longline	Other	Handline
Average	341,997	307,082	121	34,875
Percentage	100.00%	89.79%	0.04%	10.20%

Source: SEDAR 25 (2011).

Table 2. Average landings (lbs gutted weight) during 2006-2010 for commercial, headboat (HB), and MRFSS.

Species	commercial	HB	MRFSS
Golden tilefish	348,961	0	9,529

Source: SEDAR 25 (2011).

Regulations, which are currently being used to manage the golden tilefish, are annual catch limits (ACL) and bag limits. The commercial ACL is 282,819 lbs gutted weight and the recreational ACL is 1,578 fish. SEDAR 25 (2011) indicates golden tilefish is no longer experiencing overfishing and is not overfished. Furthermore, SEDAR 25 (2011) suggests the ACLs for golden tilefish can be increased, which is being considered by the South Atlantic Fishery Management Council in Regulatory Amendment to the Fishery Management Plan for the Snapper Grouper Fishery in the South Atlantic Region (Snapper Grouper FMP).

Commercial Sector

Approximately 20% of snapper grouper permitted vessels from the Gulf of Mexico and South Atlantic are randomly selected each year to fill out supplementary logbooks. SEDAR 25 (2011) indicated golden tilefish discards could not be calculated for the commercial sector due to very low sample size. Fewer than 10 trips reported golden tilefish discards during the period 2002-2010. That total included all commercial fishing gear. Several factors suggest that few golden tilefish are discarded in the commercial fishery. Golden tilefish have very specific habitat requirements and commercial fishermen report that they are able to eliminate bycatch of tilefish during closed seasons by avoiding known tilefish habitat.

Barotrauma likely results in high fishing mortality because golden tilefish habitat is relatively deep (300 feet or deeper) and those fish were retained rather than discarded dead. In addition,

there is no minimum size limit for golden tilefish. Given the rare reporting of golden tilefish discards, the ease with which golden tilefish bycatch can be avoided, the likely high mortality of caught fish, and the lack of minimum size limit, which would require discarding; SEDAR 25 (2011) determined that golden tilefish discards are probably few in number
.

Recreational Sector

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

- Type A - Fishes that were caught, landed whole, and available for identification and enumeration by the interviewers.

- Type B - Fishes that were caught but were either not kept or not available for identification:

    - Type B1 - Fishes that were caught and filleted, released dead, given away, or disposed of in some way other than Types A or B2.

    - Type B2 - Fishes that were caught and released alive.

Length and/or weight are unknown for all modes of fishing covered by the MRFSS in the South Atlantic sub-region. All live released fish statistics (B2 fish) in charter or party/charter mode were adjusted in the SEDAR 25 (2011). At-sea sampling of headboat discards was initiated (NC/SC in 2004, GA/FL in 2005) as part of the improved for-hire surveys to characterize the size distribution of live discarded fishes. Where estimates for numbers of discards are available, variance estimates are high. No discarded golden tilefish were recorded from MRFSS for 2006-2010. The estimated number of discarded golden tilefish for 2005 is 1,036 fish. No estimates of discarded golden tilefish are available from headboats (SEDAR 25 2011).

Finfish Bycatch Mortality

SEDAR 25 (2011) indicates that bycatch and discards of golden tilefish were thought to be low overall in the South Atlantic. The recommended discard mortality rate for golden tilefish is 100%. No discard estimates were included in the assessment model as discards are assumed to be negligible.

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

Amendment 18B to the Snapper Grouper FMP includes alternatives addressing the golden tilefish commercial sector that would implement gear specific endorsements, and/or change the fishing year. These actions could reduce the number of vessels targeting golden tilefish. Since bycatch is already very low for golden tilefish, no change would be expected in the level of golden tilefish bycatch. Commercial fishing for golden tilefish is very selective and the trip limit

is large enough to prevent much discarded. Furthermore, there is not a great deal of recreational effort since the species is found in deep water and far offshore.

Regulatory Amendment 12 to the Snapper Grouper FMP would consider an increase in the commercial and recreational ACL based on the results from the most recent stock assessment (SEDAR 25 2011). An increase in the ACL is not expected to change the magnitude of bycatch in the commercial sector since there is no minimum size limit and all golden tilefish are retained. In the recreational sector, there is a 1 fish per vessel limit. However, golden tilefish are not generally caught when fishermen target other snapper grouper species. Furthermore, recreational catch of golden tilefish is extremely small (Table 2) and there were no discards reported in the recreational sector during 2006-2010. As the recreational allocation is only 3% of the overall ACL, only a small increase in the recreational ACL would be expected. Therefore, very little change in the bycatch of golden tilefish is expected from an increase in the recreational ACL.

Ecological Effects Due to Changes in the Bycatch

Alternatives proposed golden tilefish in Amendment 18B to the Snapper Grouper FMP addressing the golden tilefish commercial fishery that would implement gear specific endorsements, and/or change the fishing year could reduce the number of vessels targeting golden tilefish. Bycatch is already is extremely low and no change in bycatch would be expected from the proposed measures. Regulatory Amendment 12 to the Snapper Grouper FMP includes alternative to increase the commercial and recreational ACL and is not expected to increase the number of regulatory discards.

Overall fishing effort could decrease in the commercial sector in response to the specification of endorsements if all individuals who qualify for endorsements. In contrast, the increase in the commercial and recreational ACLs proposed in Regulatory Amendment 12 to the Snapper Grouper FMP could increase effort on golden tilefish. However, the Council's Scientific and Statistical Committee has established a large buffer between the overfishing limit and the acceptable biological catch (which is set equal to the ACL). Commercial fishery for golden tilefish is very selective, and few incidental species are taken. Therefore, an increase in the ACL would not be expected to negatively affect the golden tilefish stock, and few ecological changes would be expected for proposed measures in Amendment 18B or Regulatory Amendment 12 to the Snapper Grouper FMP.

The Comprehensive ACL Amendment for species in FMPs not experiencing overfishing includes additional measures to reduce bycatch in the snapper grouper fishery with the possible establishment of species units. Species grouping would be based on biological, geographic, economic, taxonomic, technical, social, and ecological factors. Amendment 14 to the Snapper Grouper FMP (SAFMC 2009) established Marine Protected Areas to protect a portion of the population and habitat of long-lived, deepwater snapper grouper species including golden tilefish, from directed fishing pressure to achieve a more natural sex ratio, age, and size structure.

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

The establishment of an endorsement program in Amendment 18B to the Snapper Grouper FMP is not expected to result in changes in bycatch of other fish species and result in ecosystem changes. The catch level of golden tilefish is constrained by the ACL. The endorsement action would identify those individuals who could target golden tilefish.

Furthermore, the increase in the ACLs proposed in Regulatory Amendment 12 to the Snapper Grouper FMP would not be expected to change the magnitude of bycatch for golden tilefish. Currently all golden tilefish caught are retained by commercial fishermen and recreational catch is minor. With an increased in the ACLs, it is expected fishermen would continue to retain all golden tilefish caught and recreational catch would continue to be very small.

Effects on Marine Mammals and Birds

Under Section 118 of the Marine Mammal Protection Act (MMPA), NOAA Fisheries Service 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 large whales. The southeast U.S. Atlantic black sea bass pot fishery is included in the grouping of the Atlantic mixed species trap/pot fisheries, which the 2009 List of Fisheries classifies as a Category II (73 FR 73032; December 1, 2008). Gear types used in these fisheries are determined to have occasional incidental mortality and serious injury of marine mammals. For the snapper grouper fishery, the best available data on protected species interactions are from the Southeast Fisheries Science Center (SEFSC) Supplementary Discard Data Program (SDDP) initiated in July of 2001 and sub-samples 20% of the vessels with an active permit. Since August 2001, only three interactions with marine mammals have been documented; each was taken by handline gear and each release alive (McCarthy SEFSC database). The bottom longline/hook-and-line component of the South Atlantic snapper grouper fishery remains a Category III under the LOF.

Although the gear type used within the black sea bass pot fishery can pose an entanglement risk to large whales due to their distribution and occurrence, sperm, fin, sei, and blue whales are unlikely to overlap with the black sea bass pot fishery operated within the snapper grouper fishery since it is executed primarily off North Carolina and South Carolina in waters ranging from 70-120 feet deep (21.3-36.6 meters). There are no known interactions between the black sea bass pot fishery and large whales. NOAA Fisheries Service's 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 EEZ is not likely to adversely affect sperm, fin, sei, and blue whales (NMFS 2006).

Northern right and humpback whales may overlap both spatially and temporally with the black sea bass pot fishery. Recent revisions to the Atlantic Large Whale Take Reduction Plan have

folded the Atlantic mixed species trap/pot fisheries into the plan (72 FR 193; October 5, 2007). The new requirements will help further reduce the likelihood of northern right and humpback whale entanglement in black sea bass pot gear.

The Bermuda petrel and roseate tern occur within the action area. Bermuda petrels are occasionally seen in the waters of the Gulf Stream off the coasts of North and South Carolina during the summer. Sightings are considered rare and only occurring in low numbers (Alsop 2001). Roseate terns occur widely along the Atlantic coast during the summer but in the southeast region, they are found mainly off the Florida Keys (unpublished USFWS data). Interaction with fisheries has not been reported as a concern for either of these species.

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. Measures proposed in Amendment 18B and Regulatory Amendment 12 to the Snapper Grouper FMP are not expected to negatively affect marine mammals and birds.

Changes in Fishing, Processing, Disposal, and Marketing Costs

The establishment of an endorsement program in Amendment 18B to the Snapper Grouper FMP would be expected to affect the cost of fishing operations. Regulatory Amendment 12 to the Snapper Grouper FMP includes alternatives that could increase the golden tilefish ACL. Thus positive economic benefits could occur.

Changes in Fishing Practices and Behavior of Fishermen

An endorsement program proposed in Amendment 18B to the Snapper Grouper FMP could result in a modification of fishing practices by commercial and recreational fishermen; however, this change in behavior is unlikely to increase the level of bycatch, which is currently extremely low. Furthermore, an increase in the ACL proposed in Regulatory Amendment 12 to the Snapper Grouper FMP could change fishing practices and behavior of fishermen but it is unlikely to affect the level of bycatch. It is expected there would be no regulatory discards in the commercial sector and very minor discarding in the recreational sector.

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

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 (MARFIN), Saltonstall-Kennedy (S-K) program, and the Cooperative Research Program (CRP). Efforts are made to emphasize the need for observer and logbook data in requests for proposals issued by granting agencies. Amendment 18A to the Snapper Grouper FMP was approved by the Council in December and includes an action, which will improve data reporting the recreational sector. A generic amendment is being developed by the Council and Gulf of Mexico Fishery Management Council to improve data reporting.

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

Preferred management measures, including those that are likely to increase or decrease discards could result in social and/or economic impacts as discussed in Section 4 of Amendment 18B and Regulatory Amendment 12 to the Snapper Grouper FMP.

Changes in the Distribution of Benefits and Costs

There is very little bycatch in the golden tilefish portion of the snapper grouper fishery. Measures proposed in Amendment 18B and Regulatory Amendment 12 to the Snapper Grouper FMP are not expected to increase the level of bycatch. Changes in the distribution and costs of proposed measures are described in Section 4 of the amendments.

Social Effects

The social effects of all the management measure are described in Section 4 of Amendment 18B and Regulatory Amendment 12 to the Snapper Grouper FMP.

Conclusion

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality in the South Atlantic snapper grouper fishery using the ten factors provided at 50 CFR 600.350(d)(3)(i). In summary, there is very little bycatch of golden tilefish in the commercial or recreational sectors of the snapper grouper fishery. Proposed measures in Amendment 18B and Regulatory Amendment 12 to the Snapper Grouper FMP are not expected to increase since golden tilefish are not discarded by commercial fishermen and recreational catch is extremely minor.

Additional measures to reduce bycatch in the snapper grouper fishery will be implemented in the future. The Comprehensive ACL Amendment includes measures to reduce bycatch in the snapper grouper fishery including species grouping based on biological, geographic, economic, taxonomic, technical, social, and ecological factors.

Interim Tilefish Projections

Prepared by the NOAA/NMFS Southeast Fisheries Science Center, Beaufort Laboratory
Issued: 5 January 2012

Description of projections

This report describes projections of the U.S. South Atlantic tilefish population following the 2011 SEDAR 25 stock assessment. The results are intended to serve as interim deterministic estimates (e.g. first order approximation) until a more thorough treatment of the stochastic output can be completed.

Fishing mortality levels

At the last South Atlantic Fishery Management Council, Scientific and Statistical Committee meeting (November 2011), a P* (probability of overfishing) level of 35% was established for tilefish based on the ABC control rule. Using the results from the Monte-Carlo bootstrap (MCB) analysis from SEDAR 25, the distribution of F_{MSY} estimates suggested that F=0.1005 corresponds to a P* value of 35% (Figure 1). Figure 1 also shows other values of F and their corresponding P* values.

Projection Methods

Projections were run to predict stock status in years after the assessment, 2011-2020. The structure of the projection model was the same as that of the assessment model, and parameter estimates were those from the assessment. Fully selected F was apportioned between landings according to the selectivity curves averaged across fisheries, using geometric mean F from the last three years of the assessment period.

Central tendencies of SSB (time of peak spawning), F, recruits, and landings were represented by deterministic projections using parameter estimates from the base run. These projections were built on the estimated spawner-recruit relationship with bias correction, and were thus consistent with estimated benchmarks in the sense that long-term fishing at F_{MSY} would yield MSY from a stock size at SSB_{MSY}.

Point estimates of initial abundance at age in the projection (start of 2011), other than at age 1, were taken to be the 2010 estimates from the assessment, discounted by 2010 natural and fishing mortalities. The initial abundance at age 1 was computed using the estimated spawner-recruit model and a 2010 estimate of SSB.

Fishing rates or catch levels that define the projections were assumed to start in 2012, which is the earliest year management could react to this assessment. Because the assessment period ended in 2010, the projections required an initialization period (2011). Fishing mortality in 2011 was set equal to the amount yielding the estimate of the total 2011 landings.

The 2011 total landings were compiled from several sources as follows. Commercial landings were obtained from the accumulated landings system (399,664 lb whole wgt). Recreational landings were obtained from a website query of the MRFSS database, which resulted in an estimate of 9,824 fish harvested in Florida in 2011. Using an average weight estimate of 6.21 pounds whole weight (see August 14, 2009 Memorandum from the SEFSC to SERO), the MRFSS estimate of landings was computed as 61,007 (lb whole wgt). Headboat landings were assumed to be zero for this analysis. In the projection analysis, total landings of 460 (1000 lb whole wgt) were used for 2011.

Results

The results of the deterministic population projections with the constant *F* corresponding to P* = 35% suggest the population can handle an increase in fishing mortality from the 2011 estimate of 0.058 up to 0.1. This results in an increase in total landings to 789,000 (lb whole wgt) in 2012.

Year	F	SSB (mt)	R (1000 age-1)	L (1000 fish)	L (1000 lb ww)
2011	0.058	54.82	423	55	460
2012	0.1	57.76	425	93	789
2013	0.1	56.95	424	89	761
2014	0.1	55.92	423	85	737
2015	0.1	54.78	422	83	715
2016	0.1	53.63	422	81	696
2017	0.1	52.53	421	80	681
2018	0.1	51.51	420	78	667
2019	0.1	50.58	419	77	656
2020	0.1	49.75	418	76	646

The population projections indicate the recruitment, spawning biomass, and landings will all reach a peak in 2012 and then decline, in large part due to the increase in *F* from 0.058 in 2011 to 0.1 in 2012.

Specific comments on interim projections

Although the projection *F* was set equal to a P*=35% from the SEDAR 25 MCB analysis, this analysis is not consistent with a P* analysis in which the landings are set constant such that P*=35% in every year. It is likely P*≠35% in every year, with this difference increasing further into the future as uncertainty in population dynamics increases.

General comments on projections

As usual, projections should be interpreted in light of the model assumptions and key aspects of the data. Some major considerations are the following:

- In general, projections of fish stocks are highly uncertain, particularly in the long term (e.g., beyond 5-10 years).
- Although projections included many major sources of uncertainty, they did not include structural (model) uncertainty. That is, projection results are conditional on one set of functional forms used to describe population dynamics, selectivity, recruitment, etc.
- Fisheries were assumed to continue fishing at their estimated current proportions of total effort, using the estimated current selectivity patterns. New management regulations that alter those proportions or selectivities would likely affect projection results.
- The projections assumed that the estimated spawner-recruit relationship applies in the future. If future recruitment is characterized by runs of large or small year classes, possibly due to environmental or ecological conditions, stock trajectories may be affected.

Figure 1. Solid curve indicates the cumulative probability distribution of estimates of F_{MSY} from the Monte-Carlo bootstrap (MCB) analysis conducted as part of the SEDAR 25 stock assessment. Vertical lines indicate various estimates of F and their corresponding probability of overfishing (i.e. exceeding F_{MSY}).

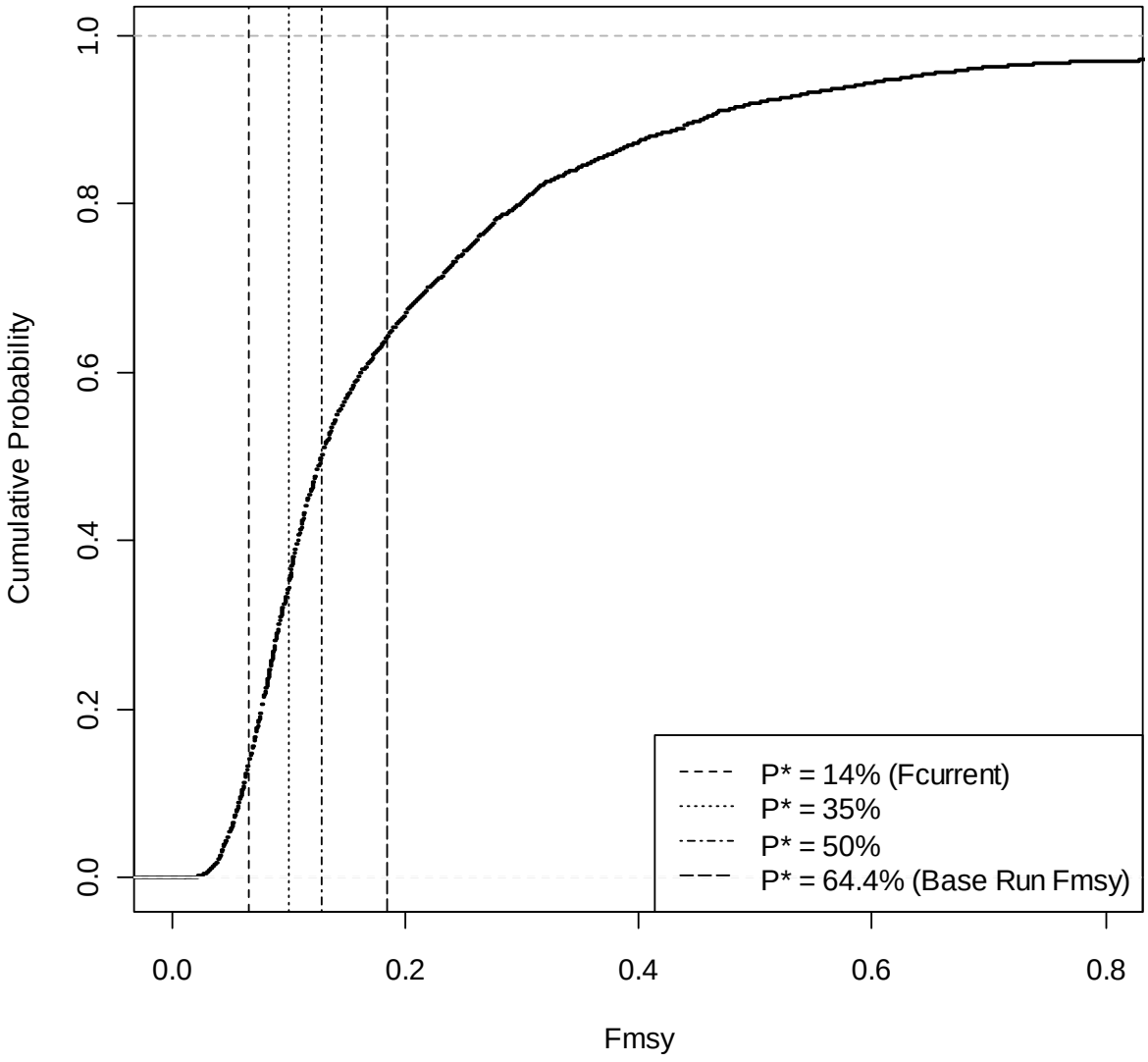

Table 3.17. Projection results under scenario 4—fishing mortality rate fixed at $F = 75\%F_{MSY}$. F = fishing mortality rate (per year), Pr(SSB > SSB_{MSY}) = proportion of stochastic projection replicates exceeding SSB_{MSY}, SSB = spawning stock (gonad weight, mt) at time of peak spawning, R = recruits (1000 age-1 fish), L = landings (1000 fish or 1000 lb *whole weight), and Sum L = cumulative landings (1000* lb*). For reference, estimated benchmarks are $F_{MSY} = 0.185$ (per yr), $SSB_{MSY} = 25.3$ (mt), and MSY = 638 (1000 lb). Expected values presented are from deterministic projections (klb = 1000 lb).*

Year	F(per yr)	Pr(SSB > SSB_{MSY})	SSB(mt)	R(1000)	L(1000)	L(klb)	Sum L(klb)
2011	0.067	0.92	54.82	423	63	528	528
2012	0.139	0.98	56.47	424	125	1062	1590
2013	0.139	0.98	53.89	422	116	991	2581
2014	0.139	0.98	51.34	420	109	931	3512
2015	0.139	0.98	48.94	418	104	880	4393
2016	0.139	0.98	46.77	416	100	839	5231
2017	0.139	0.98	44.85	414	96	805	6036
2018	0.139	0.98	43.18	412	94	777	6812
2019	0.139	0.98	41.75	410	92	753	7566
2020	0.139	0.97	40.52	409	90	734	8300
2021	0.139	0.97	39.49	408	89	718	9018
2022	0.139	0.96	38.61	406	88	705	9723
2023	0.139	0.96	37.87	405	86	693	10,416
2024	0.139	0.95	37.24	404	86	684	11,100
2025	0.139	0.94	36.7	404	85	676	11,775
2026	0.139	0.94	36.24	403	84	669	12,444
2027	0.139	0.93	35.84	402	84	663	13,106
2028	0.139	0.92	35.51	402	83	658	13,764
2029	0.139	0.91	35.23	401	83	653	14,417
2030	0.139	0.9	34.99	401	82	649	15,066

Tilefish P*=0.35 Projections

Prepared by the NOAA/NMFS Southeast Fisheries Science Center, Beaufort Laboratory
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Description of projections

At the last South Atlantic Fishery Management Council's, Scientific and Statistical Committee meeting (November 2011), a P* (probability of overfishing) level of 35% was established for tilefish based on the South Atlantic Fishery Management Council's ABC control rule. This report describes projections based on a P*=35% for the U.S. South Atlantic tilefish population following the 2011 SEDAR 25 stock assessment.

Projection Methods

The recursive algorithm described in Shertzer et al. (2010) as sequential PASCL was used to estimate acceptable biological catch (ABC) levels consistent with P*=35%. The stochastic output from the Monte Carlo/Bootstrap (MCB) analysis of the SEDAR 25 stock assessment was incorporated into the sequential PASCL algorithm in order to carry all uncertainty from the assessment into the projections. This complexity added to the sequential PASCL algorithm resulted in a tremendous increase in the computation time. As a result, the completion of 5,000 iterations for a five year projection analysis took approximately 65 hours to run. This analysis was run two times to determine if 5,000 iterations was sufficient for the results to be independent of the random number seed. The difference between these two runs was negligible, with approximately a 1% difference in values. Because of time constraints, the final results presented in this analysis are based on an average of these two runs.

The sequential PASCL algorithm can take into account the uncertainty associated with implementation (i.e. catching the target). Because no estimates for this type of uncertainty are available for tilefish, this analysis assumed the implementation uncertainty was zero (i.e. realized catch equals ABC exactly). It should be noted that in recent years the quota for tilefish has been exceeded by varying amounts. Should that trend continue into future years, such overages will not be accounted for in this analysis, particularly for years beyond 2012.

Stochastic projections were run to predict stock status in years after the assessment, 2011-2015. The basic structure of the projection model was the same as that of the assessment model, and parameter estimates were those from the assessment and MCB output. Fully selected *F* was apportioned between landings according to the selectivity curves averaged across fisheries, using geometric mean *F* from the last three years of the assessment period.

Point estimates of initial abundance at age in the projection (start of 2011), other than at age 1, were taken to be the 2010 estimates from each MCB run of the assessment, discounted by 2010 natural and fishing mortalities.

Fishing rates or catch levels that define the projections were assumed to start in 2012, which is the earliest year management could react to this assessment. Because the assessment period ended in 2010, the projections required an initialization period (2011). Fishing mortality in 2011 was assumed equal to the geometric mean F from the last three years of the assessment period.

To characterize uncertainty in future stock dynamics, stochasticity was included in replicate projections, each an extension of a single MCB assessment model fit. Thus, projections carried forward uncertainties in natural mortality, as well as in estimated quantities such as spawner-recruit parameters, selectivity curves, and in initial (start of 2011) abundance at age. Initial and subsequent recruitment values were generated with stochasticity using a Monte Carlo procedure, in which the estimated Beverton-Holt model of each MCB fit was used to compute mean annual recruitment values. Variability was added to the mean values by choosing multiplicative deviations at random from the recruitment deviations estimated for that chosen MCB run.

Because the base run model assumed no recruitment deviation (i.e. no stochasticity) for years 2004-2010 at age-1, the initial projection year (start of 2011) ages 2-7, which correspond to age-1 recruits in 2004-2010, included additional variability in recruitment following the same method for subsequent years at age-1.

The 2011 total landings were compiled from several sources as follows. Commercial landings were obtained from the accumulated landings system (399,664 lb whole wgt). Recreational landings were obtained from a website query of the MRFSS database, which resulted in an estimate of 9,824 fish harvested in Florida in 2011. Using an average weight estimate of 6.21 pounds whole weight (see August 14, 2009 Memorandum from the SEFSC to SERO), the MRFSS estimate of landings was computed as 61,007 (lb whole wgt). Headboat landings were assumed to be zero for this analysis. In the projection analysis, total landings of 460 (1000 lb whole wgt) were used for 2011.

Results

The results of the stochastic population projections with P* = 35% suggest the population can handle an increase in fishing mortality from the 2011 median estimate of 0.07 up to 0.09 (Table 1). This results in an increase in total landings to 668,000 (lb whole wgt) in 2012.

Table 1. Averaged results from two stochastic population projections for U.S. South Atlantic tilefish with a probability of overfishing (P*) equal to 35%. Spawning stock biomass (SSB) is in units of female gonad weight (mt) and acceptable biological catch (ABC) (1000 lb whole weight).

Year	$pr(F>F_{MSY})$	$F_{(10\%)}$	$F_{(50\%)}$	$F_{(90\%)}$	$pr(SSB>SSB_{MSY})$	$SSB_{(10\%)}$	$SSB_{(50\%)}$	$SSB_{(90\%)}$	ABC (1000 lb)
2011	0.23	0.03	0.07	0.16	0.94	28	50	106	460*
2012	0.35	0.04	0.09	0.24	0.95	28	53	118	668
2013	0.35	0.03	0.09	0.25	0.93	27	54	129	669
2014	0.35	0.03	0.09	0.25	0.91	26	55	137	666
2015	0.35	0.03	0.09	0.25	0.90	25	55	146	655

**ABC value for 2011 is based on estimated landings (see text).*

The population projections indicate the spawning biomass and landings will reach a peak and then start to decline, in large part due to the increase in *F* from 0.07 in 2011 to 0.09 in 2012 (Table 1). The Monte Carlo-bootstrap (MCB) results from the SEDAR 25 stock assessment also estimated some large year classes in the early 2000's and the passing of these year classes through the age structure explains part of the patterns indicated above.

General comments on projections

As usual, projections should be interpreted in light of the model assumptions and key aspects of the data. Some major considerations are the following:

- The P* used in this analysis is conditional on the assumptions made about management/implementation uncertainty. In this case there was no information on this type of uncertainty and therefore it was assumed to be zero (e.g. realized catch = ABC). If this assumption is violated, the projection results would be affected.
- Although projections included many major sources of uncertainty, they did not include structural (model) uncertainty. That is, projection results are conditional on one set of functional forms used to describe population dynamics, selectivity, recruitment, etc.
- Fisheries were assumed to continue fishing at their estimated current proportions of total effort, using the estimated current selectivity patterns. New management regulations that alter those proportions or selectivities would likely affect projection results.
- The projections assumed that the estimated spawner-recruit relationship applies in the future. If future recruitment is characterized by runs of large or small year classes, possibly due to environmental or ecological conditions, stock trajectories may be affected.

Literature Cited

Shertzer, K.W., M.H. Prager, and E.H. Williams. 2010. Probabilistic approaches to setting acceptable biological catch and annual catch targets for multiple years: reconciling methodology with national standard guidelines. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystems 2:451-458.

Figure 1. Averaged results from two stochastic projection analyses with P*=35%. Panel (A) solid circles indicate the value of P* for each year of the projection. Panel (B) and (C) indicate the 10th, 50th (solid line with filled circles), and 90th percentiles for fishing mortality and spawning stock biomass (mt). Panel (D) indicates the landings (1000 lb whole weight) values that correspond to P*=35% for each year of the projection.