Amendment 17B 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 Social Impact Assessment/Fishery Impact Statement

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ABBREVIATIONS AND ACRONYMS

ABC	Acceptable biological catch
ACCSP	Atlantic Coastal Cooperative Statistics Program
ACL	Annual Catch Limits
AM	Accountability Measure
ACT	Annual Catch Target
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
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
CEA	Cumulative Effects Analysis
CEQ	Council on Environmental Quality
CFMC	Caribbean Fishery Management Council
CPUE	Catch per unit effort
CRP	Cooperative Research Program
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFH-HAPC	Essential Fish Habitat - Habitat Area of Particular Concern
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
F	A measure of the instantaneous rate of fishing mortality
$F_{30\%SPR}$	Fishing mortality that will produce a static SPR = 30%.
$F_{45\%SPR}$	Fishing mortality that will produce a static SPR = 45%.
F_{CURR}	The current instantaneous rate of fishing mortality
F_{MSY}	The rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}
F_{OY}	The rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}
FEIS	Final Environmental Impact Statement
FMP	Fishery management plan
FMU	Fishery management unit
FONSI	Finding of No Significant Impact
GFMC	Gulf of Mexico Fishery Management Council
IFQ	Individual fishing quota
M	Natural mortality rate
MARFIN	Marine Fisheries Initiative
MARMAP	Marine Resources Monitoring Assessment and Prediction Program
MBTA	Migratory Bird Treaty Act

MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act of 1972
MRFSS	Marine Recreational Fisheries Statistics Survey
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act of 1969
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuary Act
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Limit
OY	Optimum Yield
PQBM	Post Quota Bycatch Mortality
PSE	Percent Standard Error
R	Recruitment
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAFE Report	Stock Assessment and Fishery Evaluation Report
SAMFC	South Atlantic Fishery Management Council
SDDP	Supplementary Discard Data Program
SEDAR	Southeast Data Assessment and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SFA	Sustainable Fisheries Act
SIA	Social Impact Assessment
SPR	Spawning Potential Ratio
SSC	Scientific and Statistical Committee
TAC	Total allowable catch
TL	Total length
T_{MIN}	The length of time in which a stock could rebuild to B_{MSY} in the absence of fishing mortality
USCG	U.S. Coast Guard

AMENDMENT 17B TO THE FISHERY MANAGEMENT PLAN FOR THE SNAPPER GROUPER FISHERY OF THE SOUTH ATLANTIC REGION

INCLUDING AN ENVIRONMENTAL ASSESSMENT AND A SOCIAL IMPACT ASSESSMENT/FISHERY IMPACT STATEMENT

Proposed actions:	Specify ACLs, ACTs, and AMs for 9 species undergoing overfishing. Modify management measures to limit harvest to or less than ACL or ACT. Update framework procedure to include ACLs, ACTs, and AMs.
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ABSTRACT

The need for action through Amendment 17B is to establish annual catch limits (ACLs), annual catch targets (ACTs), and accountability measures (AMs) for species experiencing overfishing. Species in the fishery management unit are assessed on a routine basis and stock status may change as new information becomes available. In addition, changes in management regulations, fishing techniques, and social/economic structure can result in shifts in the percentage of harvest between user groups over time. More specifically, the actions proposed in Amendment 17B would:

- Specify ACLs, ACTs, and AMs for 9 species undergoing overfishing;
- Modify management measures to limit total mortality to the ACL;
- Specify allocations for golden tilefish; and
- Update the framework procedure for specification of total allowable catch.

This environmental assessment (EA) has been prepared to analyze the effects of implementing regulations as listed above.

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SNAPPER GROUPER AMENDMENT 17B LIST OF ACTIONS

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Action 1. Speckled hind/warsaw grouper annual catch limit (ACL). Establish an ACL = 0 (landed catch only) for speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of other deepwater snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) beyond a depth of 240 feet (40 fathoms; 73 m). 150

Action 2. Golden tilefish allocations. Define allocations for golden tilefish based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on the following formula for each sector: Sector apportionment = (50% * average of long catch range (lbs) 1986-2008) + (50% * average of recent catch trend (lbs) 2006-2008). 186

Action 3. Golden tilefish annual catch limits (ACLs) and accountability measures (AMs). Establish the ACL at the F_{OY} level (Total ACL = 326,554 lbs whole weight or 291,566 lbs gutted weight). The commercial ACL (282,819 lbs gutted weight) is based on the allocation alternative selected (97% commercial: 3% recreational). The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is projected to be met. All purchase and sale is prohibited when the quota is projected to be met. Specify a recreational ACL in numbers of fish (1,578 fish) based upon the allocation decision (97% commercial: 3% recreational) and the yield at F_{OY}. Implement accountability measures (AMs) for the recreational sector for golden tilefish. If the ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing season by the amount necessary to ensure landings do not exceed the 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. 192

Action 4. Snowy grouper accountability measures (AMs). Establish a recreational daily bag limit of 1 snowy grouper *per vessel*. Implement accountability measures (AMs) for the recreational sector for snowy grouper. If the recreational ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing season by the amount necessary to ensure landings do not exceed the recreational 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. 211

Action 5. Black grouper, black sea bass, gag, red grouper, and vermilion snapper annual catch limits (ACLs) and accountability measures (AMs). Retain the commercial ACL for gag of 352,940 lbs gutted weight and the commercial AM to prohibit commercial harvest of shallow water groupers when the quota is projected to be met. Retain the recreational ACL for gag of 340,060 lbs gutted weight. In addition, establish an ACL for gag, black grouper, and red grouper of 662,403 lbs gutted weight (commercial) and 648,663 lbs gutted weight (recreational). [These values are equivalent to the expected catch resulting from the implementation of management measures for red grouper and black grouper in Amendment 16 and the gag quota specified in Amendment 16.] Prohibit the commercial possession of shallow water groupers when the gag or the gag, black grouper, and red grouper ACL is projected to be met. For black grouper, black sea bass, gag, red grouper, and vermilion snapper, compare the recreational ACL with 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. If at least one of the species is overfished and the sector ACL is projected to be met, prohibit the harvest and retention of the species or species group. If the ACL is exceeded, independent of stock status, the Regional Administrator should publish a notice to reduce the sector ACL in the following season by the amount of the overage. 228
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Action 6. Update the framework procedure. Update the framework procedure for specification of Total Allowable Catch (TAC) for the Snapper Grouper Fishery Management Plan (FMP) to incorporate ACLs, ACTs, and, AMs. Such modifications would be based upon new scientific information indicating such modifications are prudent. 254

I. Snapper Grouper FMP Framework Procedure for Specification of Annual Catch Limits, Annual Catch Targets, Overfishing Limits, Acceptable Biological Catch, and annual adjustments:

Procedure for Specifications:

1. At times determined by the SEDAR Steering Committee, and in consultation with the Council and NMFS Southeast Regional Office (SERO), stock assessments or assessment updates will be conducted under the SEDAR process for stocks or stock complexes managed under the Snapper Grouper FMP. Each SEDAR stock assessment or assessment update will: a) assess to the extent possible the current biomass, biomass proxy, or SPR levels for each stock; b) estimate fishing mortality (F) in relation to F_{MSY} (MFMT) and F_{OY}; c) determine the overfishing limit (OFL); d) estimate other population parameters deemed

appropriate; e) summarize statistics on the fishery for each stock or stock complex; f) specify the geographical variations in stock abundance, mortality, recruitment, and age of entry into the fishery for each stock or stock complex; and g) develop estimates of B_{MSY}.

2. The Council will consider SEDAR stock assessments or other documentation the Council deems appropriate to provide the biological analysis and data listed above in paragraph 1. Either the SEFSC or the stock assessment branch of a state agency may serve as the lead in conducting the analysis, as determined by the SEDAR Steering Committee. The Scientific and Statistical Committee (SSC) will prepare a written report to the Council specifying an OFL and may recommend a range of ABCs for each stock complex that is in need of catch reductions for attaining or maintaining OY. The OFL is the annual harvest level corresponding to fishing at MFMT (F_{MSY}). The ABC range is intended to provide guidance to the SSC and is the OFL as reduced due to scientific uncertainty in order to reduce the probability that overfishing will occur in a year. To the extent practicable, the probability that overfishing will occur at various levels of ABC and the annual transitional yields (i.e., catch streams) calculated for each level of fishing mortality within the ABC range should be included with the recommended range.

For overfished stocks, the recommended range of ABCs shall be calculated so as to end overfishing and achieve snapper grouper population levels at or above B_{MSY} within the rebuilding periods specified by the Council and approved by NOAA Fisheries Service. The SEDAR report or SSC will recommend rebuilding periods based on the provisions of the National Standard Guidelines, including generation times for the affected stocks. Generation times are to be specified by the stock assessment panel based on the biological characteristics of the individual stocks. The report will recommend to the Council a B_{MSY} level and a MSST from B_{MSY}. The report may also recommend more appropriate estimates of F_{MSY} for any stock. The report may also recommend more appropriate levels for the MSY proxy, OY, the overfishing threshold (MFMT), and overfished threshold (MSST). For stock or stock complexes where data are inadequate to compute an OFL and recommended ABC range, the SSC will use other available information as a guide in providing their best estimate of an OFL corresponding to MFMT and ABC range that should result in not exceeding the MFMT.

3. The SSC will examine SEDAR reports or other new information, the OFL determination, and the recommended range of ABC. In addition, the SSC will examine information provided by the social scientists and economists from the Council staff and from the SERO Fisheries Social Science Branch analyzing social and economic impacts of any specification demanding adjustments of allocations, ACLs, ACTs, AMs, quotas, bag limits, or other fishing restrictions. The SSC will use the ABC control rule to set their ABC recommendation at or below the OFL, taking in account scientific uncertainty. If the SSC sets their ABC recommendation equal to OFL, the SSC will provide its rational why it believes that level of fishing will not exceed MFMT.

4. The Council may conduct a public hearing on the reports and the SSC's ABC recommendation at, or prior, to the time it is considered by the Council for action. Other public hearings may be held also. The Council may request a review of the report by its Snapper Grouper Advisory Panel and optionally by its socioeconomic experts and convene these groups before taking action.

5. The Council, in selecting an ACL, ACT, AM, and a stock restoration time period, if necessary, for each stock or stock complex for which an ABC has been identified, will, in addition to taking into consideration the recommendations and information provided for in paragraphs 1, 2, 3, and 4, utilize the following criteria:

> **a.** Set ACL at or below the ABC specified by the SSC or set a series of annual ACLs at or below the projected ABCs in order to account for management uncertainty. If the Council sets ACL equal to ABC, and ABC has been set equal to OFL, the Council will provide its rationale as to why it by it believes that level of fishing will not exceed MFMT.
>
> **b.** May subdivide the ACLs into commercial, for-hire, and private recreational sector ACLs that maximize the net benefits of the fishery to the nation. The Sector ACLs will be based on allocations determined by criteria established by the Council and specified by the Council through a plan amendment. If, for an overfished stock, harvest in any year exceeds the ACL or sector ACL, management measure and catch levels for that sector will be adjusted in accordance with the AMs established for that stock.
>
> **c.** Set ACTs or sector ACTs at or below ACLs and in accordance with the provision of the AM for that stock. The ACT is the management target that accounts for management uncertainty in controlling the actual catch at or below the ACL. If an ACL is exceeded repeatedly, the Council has the option to establish an ACT if one does not already exist for a particular stock and adjust or establish AMs for that stock as well.

6. The Council will provide the SSC specification of OFL; SSC recommendation of ABC; and its recommendations to the NOAA Fisheries Service Regional Administrator for ACLs, sector ACLs, ACTs, sector ACTs, AMs, sector AMs, and stock restoration target dates for each stock or stock complex, estimates of B_{MSY} and MSST, estimates of MFMT, and the quotas, bag limits, trip limits, size limits, closed seasons, and gear restrictions necessary to avoid exceeding the ACL or sector ACLS, along with the reports, a regulatory impact review and proper National Environmental Policy Act (NEPA) documentation, and the proposed regulations within a predetermined time as agreed upon by the Council and Regional Administrator. The Council may also recommend new levels or statements for MSY (or proxy) and OY.

7. The Regional Administrator will review the Council's recommendations and supporting information, and, if he concurs that the recommendations are consistent with the objectives of the FMP, the National Standards, and other applicable law, he shall forward for publication notice of proposed rules to the Assistant Administrator (providing appropriate time for additional public comment). The Regional Administrator will take into consideration all public comment and information received and will forward for publication in the *Federal Register* of a final rule within 30 days of the close of the public comment, or such other time as agreed upon by the Council and Regional Administrator.

8. Appropriate regulatory changes that may be implemented by final rule in the *Federal Register* include:

a. ACLs or sector ACLs, or a series of annual ACLs or sector ACLs.

b. ACTs or sector ACTs, or a series of annual ACTs or sector ACTs and establish ACTs for stocks which do not have an ACT.

c. AMs or sector AMs.

d. Bag limits, size limits, vessel trip limits, closed seasons or area, gear restrictions, and quotas designed to achieve OY and keep harvest levels from exceeding the ACL or sector ACL.

e. The time period specified for rebuilding an overfished stock, estimated MSY and MSST for overfished stocks, and MFMT.

f. New levels or statements of MSY (or proxy) and OY for any stock.

g. New levels of total allowable catch (TAC).

h. Adjust fishing seasons/years.

9. The NMFS Regional Administrator is authorized, through notice action, to conduct the following activities.

a. Close the commercial fishery of a snapper grouper species or species group that has a commercial quota or sub-quota at such time as projected to be necessary to prevent the commercial sector form exceeding its sector ACL or ACT for the remainder of the fishing year or sub-quota season.

b. Close the recreational fishery of a snapper grouper species or species group at such time as projected to be necessary to prevent recreational sector ACLs or ACTs from being exceeded.

c. Reopen a commercial or recreational season that had been prematurely closed if needed to assure that a sector ACL or ACT can be reached.

10. If NMFS decides not to publish the proposed rule for the recommended management measures, or to otherwise hold the measures in abeyance, then the Regional Administrator must notify the Council of its intended action and the reasons for NMFS concern along with suggested changes to the proposed management measures that would alleviate the concerns. Such notice shall specify: 1) The applicable law with which the amendment is inconsistent; 2) the nature of such inconsistencies; and 3) recommendation concerning the action that could be taken by the Council to conform the amendment to the requirements of applicable law.

II. Establish a procedure to allow for rapid modification to definitions of Essential Fish Habitat (EFH); establishment of new, or modification of existing, Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs); and establishment of new, or modification of existing, Coral-Habitat Areas of Particular Concern.

This adjustment procedure will allow the Council to add or modify measures through a streamlined public review process. As such, measures that have been identified could be implemented or adjusted at any time during the year. The process is as follows:

1. The Council will call upon the Habitat and Environmental Protection Advisory Panel (Panel) for EFH-related actions and the Coral Advisory Panel for Coral-HAPC related actions. The Habitat and/or Coral Advisory Panel(s) will present a report of their assessment and recommendations to the Council.

2. The Council may take framework action one or more times during a year based on need. Such action(s) may come from the Panel report or the Council may take action based on issues/problems/information that surface separate from the Panel. The steps are as follows:

A. Habitat or Coral Advisory Panel Report - The Council will consider the report and recommendations of the Panel and hold public hearings at a time and place of the Council's choosing to discuss the Panel's report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the Panel's report and provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

B. Information separate from Panel Report - The Council will consider information that surfaces separate from the Panel. Council staff will compile the information and analyze the impacts of likely alternatives to address the particular situation. The Council staff report will be presented to the Council. A public hearing will be held at the time and place where the Council considers the Council staff report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the staff report and provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

3. If the Council determines that an addition or adjustment (e.g., in a species or species complex definition of EFH or EFH-HAPCs or a new EFH-HAPC is proposed for a species or species complex) to EFH, EFH-HAPCs, or Coral-HAPCs is necessary to meet the goals and objectives of the Habitat Plan, it will recommend, develop, and analyze appropriate action over the span of at least two Council meetings. The Council will provide the public with:

A. Advance notice of the availability of the recommendation.

B. The appropriate justifications, and biological, economic, and social analyses.

C. An opportunity to comment on the proposed adjustments prior to and at the second Council meeting.

4. After developing management actions and receiving public testimony, the Council will then submit the recommendation to the Regional Administrator. The Council's recommendation to the Regional Administrator must include supporting rationale, an analysis of impacts, and a recommendation to the Regional Administrator on whether to publish the management measure(s) as a final rule.

5. If the Council recommends that the management measures should be published as a final rule, the Council must consider at least the following factors and provide support and analysis for each factor considered:

A. Whether the availability of data on which the recommended management measures are based allows for adequate time to publish a proposed rule.

B. Whether regulations have to be in place for an entire harvest/fishing season.

C. Whether there has been adequate notice and opportunity for participation by the public and members of the affected industry in the development of the Council's recommended management measures.

D. Whether there is an immediate need to protect the resource.

E. Whether there will be a continuing evaluation of management measures adopted following their promulgation as a final rule.

6. If, after reviewing the Council's recommendation and supporting information based on the FMP and the administrative record:

A. The Regional Administrator concurs with the Council's recommended management measures and determines that the recommended management measures may be published as a final rule then the action will be published in the Federal Register as a final rule; or

B. The Regional Administrator concurs with the Council's recommendation and determines that the recommended measures should be published first as a proposed rule, the action will be published as a proposed rule in the Federal Register. After additional public comment, if the Regional Administrator concurs with the Council recommendation, the action will be published as a final rule in the Federal Register; or

C. The Regional Administrator does not concur, the Council will be notified, in writing, of the reason for non-concurrence and recommendations to address those concerns.

7. Appropriate adjustments that may be implemented by the Secretary by proposed and final rules in the Federal Register are:

A. Definition of or modification of a current definition of Essential Fish Habitat for a managed species or species complex.

B. Establishment of or modification of EFH-HAPCs for managed species or species complex.

C. Establishment of or modifications of Coral-HAPCs.

D. Description, identification, and regulations of fishing activities to protect EFH and EFH-HAPCs.

E. Management measures to reduce or eliminate the adverse effects of fishing activities or fishing gear on EFH or EFH-HAPCs.

F. Regulations of EFH-HAPCs.

SUMMARY

The purpose of this amendment is to establish Annual Catch Limits (ACLs) and Accountability Measures (AMs), where needed, including management measures to reduce the probability that catches will exceed the stocks' ACLs pursuant to Reauthorized Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requirements. The Council will also consider the specification of Annual Catch Targets (ACT)where necessary. Previously implemented snapper grouper amendments may contain management measures for species undergoing overfishing that are comparable to ACLs and AMs. The final National Standard 1 (NS1) guidelines recognizes that existing FMPs may use terms and values that are similar to, associated with, or may be equivalent to the overfishing limit (OFL), acceptable biological catch (ABC), ACL, ACT, and AM in many fisheries for which annual specifications are set for different stocks or stock complexes. In these situations the guidelines suggest that, as Councils revise their FMPs, they use the same terms as set forth in the NS1 guidelines. The status quo alternatives would retain management measures that are equivalent to OFLs, ACLs, and AMs specified by the Reauthorized Magnuson-Stevens Act and the final NS1 guidelines and recommended by the Council's Scientific and Statistical Committee (SSC) for previous amendments. ACL and AM alternatives are provided for other snapper grouper species that are undergoing overfishing and currently have no applied regulations qualifying as ACLs or AMs. The SSC recommended at their December 2008 meeting that the ABC levels for overfished species (i.e., snowy grouper, black sea bass, and red snapper) be set consistent with the rebuilding plans for those species until they can be further amended based on better scientific information. The SSC met in March and June 2009 to identify protocol for determining ABCs, which will be included in the Comprehensive ACL amendment. At their June 2009 meeting, the SSC provided ABC recommendations for gag and vermilion snapper. The SSC recommended waiting for the results of the stock assessments for both black grouper and red grouper to determine ABC values for those species. The SSC did not provide an ABC value for golden tilefish because of the age of the assessment and lack of a current estimate of abundance.

To summarize, actions proposed in Amendment 17B would:

- 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.
- Specify allocations for golden tilefish.
- Update the framework procedure for specification of total allowable catch.

The ACLs and AMs that currently exist, as well as those that are proposed in this amendment are summarized in Tables S-1 and S-2. Additionally, the SSCs recommendations for OFL and ABC upon which the proposed ACLs are based are shown.

Table S-1. Overfishing Level (OFL) and Acceptable Biological Catch (ABC) Recommendations from SSC, Including the Annual Catch Limits In Place and Proposed In Amendment 17B.

Species	OFL Recommendation from SSC	ABC Recommendation from SSC	ACLs In Place	ACLs In Preferred Alternatives in 17B
Black grouper	None specified	None specified	None in place	Comm Aggregate ACL (black, red, & gag) = 662,403 lbs gw Rec Aggregate ACL = 648,663 lbs gw
Black sea bass	OFL = Yield at MFMT	ABC = rebuilding plan = 847,000 lbs ww or 717,797 lbs gw	309,000 lbs gw (comm.) 409,000 lbs gw (rec.)	No change proposed
Gag	OFL = Yield at MFMT	805,000 lbs gw (landed catch); 885,000 lbs gw (total kill)	353,940 lbs gw (comm.) 340,060 lbs gw (rec.)	KEEP 353,940 lbs gw (comm.) 340,060 lbs gw (rec.) IN ADDITION Comm Aggregate ACL (black, red, & gag) = 662,403 lbs gw Rec Aggregate ACL = 648,663 lbs gw
Golden tilefish	None specified	None specified	331,000 lbs ww (comm.) 295,000 lbs gw (comm..) (F_{MSY} level)	282,819 lbs gw (comm.) 1,578 fish (rec)
Red grouper	None specified	None specified	None in place	Comm Aggregate ACL (black, red, & gag) = 662,403 lbs gw Rec Aggregate ACL = 648,663 lbs gw
Snowy grouper	OFL = Yield at MFMT	ABC = rebuilding plan = 102,960 lbs ww or 87,254 lbs gw	82,900 lbs gw (comm.) 523 fish (rec)	No change proposed
Speckled hind	SSC Recommendation=Unknown	0 (landings only)	None in place	0 (landings only) comm. and rec.
Vermilion snapper	None specified	1,078,000 lbs ww (landed catch); 1,109,000 lbs ww (total kill)	315,523 lb gw (Jan-June) (comm.) 302,523 lbs gw (July-Dec) (comm.) 307,315 lbs gw (rec.)=TOTAL **925,361 lbs gw**	No change proposed
Warsaw grouper	SSC Recommendation=Unknown	0 (landings only)	None in place	0 (landings only) comm. and rec.

Table S-2. Accountability Measures (AM) in place and proposed in Amendment 17B as outlined in preferred alternatives. The AMs proposed in the amendment are in bold while those in place are not.

ACCOUNTABILITY MEASURES				
	Commercial		Recreational	
	In-Season	Overage	In-Season	Overage
Speckled hind	Closure[1]	Closure[1]	Closure[1]	Closure[1]
Warsaw grouper	Closure[1]	Closure[1]	Closure[1]	Closure[1]
Snowy Grouper	Close fishery when quota projected to be met		None	**Shorten length of following fishing season to ensure landings do not exceed rec. ACL the following year; use 3 year running average**
Golden tilefish	Close fishery when quota projected to be met	None	None	**Shorten length of following fishing season to ensure landings do not exceed rec. ACL the following year; use 3 year running average[2]**
Gag	Close SWG fishery when gag ACL is projected to be met; **in addition to gag ACL, create black, red, and gag ACL. Close SWG when either is met first.**	None	**If gag is overfished and ACL is met, close SWG fishery. Create black, red, and gag ACL. If gag, black, or red is overfished, close SWG fishery.**	**Independent of stock status, if individual species recreational ACL is exceeded, reduce species recreational ACL the following year by overage. Use 3 year running average.[2]**
Black grouper	Close SWG fishery when gag ACL is projected to be met; **in addition to gag ACL, create black, red, and gag ACL. Close SWG when either is met first.**	None		
Red grouper	Close SWG fishery when gag ACL is projected to be met; **in addition to gag ACL, create black, red, and gag ACL. Close SWG when either is met first.**	None		
Black sea bass	Close fishery when quota projected to be met	None	**If species is overfished and ACL is met, prohibit harvest of species.**	
Vermilion snapper	Close fishery when quota projected to be met	None		

[1]The deepwater closure may be considered as a type of AM.
[2]The alternative reads: Alternative 4 (Preferred). For black grouper, black sea bass, gag, red grouper, and vermilion snapper, compare recreational ACL with 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 three-year running average.

1 Introduction

1.1 Background

Management of the Federal snapper grouper fishery located off the South Atlantic in the 3-200 nautical mile (nm) U.S. Exclusive Economic Zone (EEZ) is conducted under the Fishery Management Plan for the snapper grouper Fishery (SAFMC 1983) (Figure 1-1). The fishery management plan (FMP) and its amendments are developed under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), other applicable Federal laws, and executive orders (E.O.s) and affect the management of the 73 species listed below. The purpose of the FMP, as amended, is to manage the snapper grouper fishery for optimum yield (OY) and specify ACLs, ACTs, and AMs as needed for species undergoing overfishing.

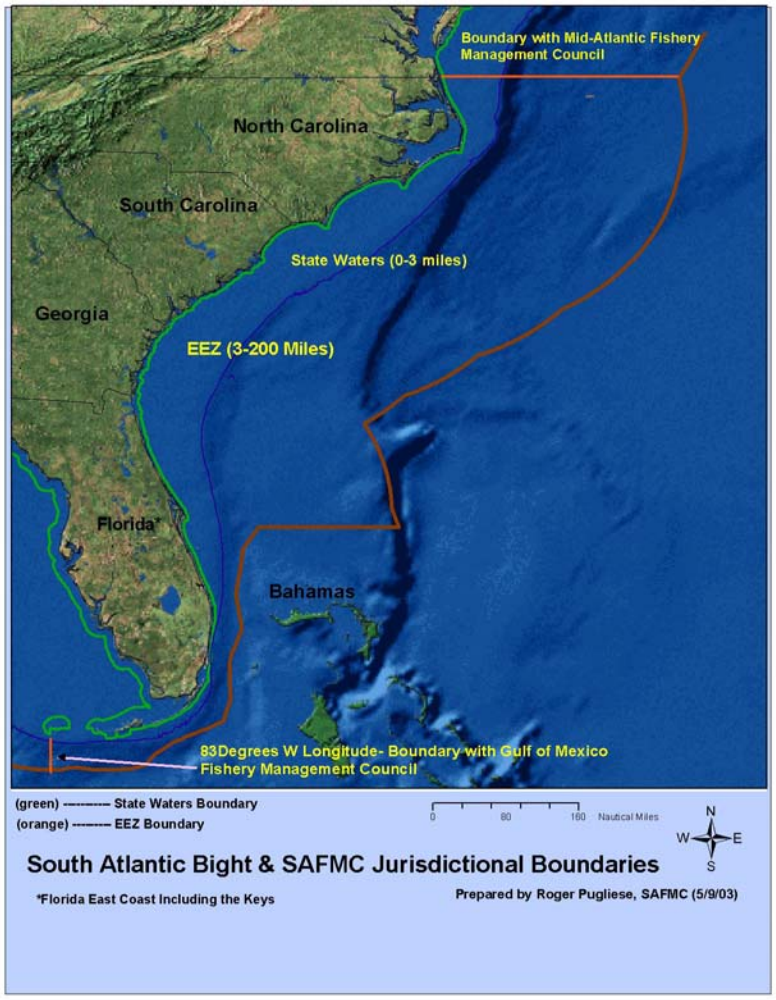


Figure 1-1. Jurisdictional boundaries of the South Atlantic Fishery Management Council.

Almaco jack, *Seriola rivoliana*
Atlantic spadefish, *Chaetodipterus faber*
Banded rudderfish, *Seriola zonata*
Bank sea bass, *Centropristis ocyurus*
Bar jack, *Carangoides ruber*
Black grouper, *Mycteroperca bonaci*
Black margate, *Anisotremus surinamensis*
Black sea bass, *Centropristis striata*
Black snapper, *Apsilus dentatus*
Blackfin snapper, *Lutjanus buccanella*
Blue runner, *Caranx crysos*
Blueline tilefish, *Caulolatilus microps*
Bluestriped grunt, *Haemulon sciurus*
Coney, *Cephalopholis fulva*
Cottonwick, *Haemulon melanurum*
Crevalle jack, *Caranx hippos*
Cubera snapper, *Lutjanus cyanopterus*
Dog snapper, *Lutjanus jocu*
French grunt, *Haemulon flavolineatum*
Gag, *Mycteroperca microlepis*
Golden tilefish, *Lopholatilus chamaeleonticeps*
Goliath grouper, *Epinephelus itajara*
Grass porgy, *Calamus arctifrons*
Gray (mangrove) snapper, *Lutjanus griseus*
Gray triggerfish, *Balistes capriscus*
Graysby, *Cephalopholis cruentata*
Greater amberjack, *Seriola dumerili*
Hogfish, *Lachnolaimus maximus*
Jolthead porgy, *Calamus bajonado*
Knobbed porgy, *Calamus nodosus*
Lane snapper, *Lutjanus synagris*
Lesser amberjack, *Seriola fasciata*
Longspine porgy, *Stenotomus caprinus*
Mahogany snapper, *Lutjanus mahogoni*
Margate, *Haemulon album*
Misty grouper, *Epinephelus mystacinus*
Mutton snapper, *Lutjanus analis*
Nassau grouper, *Epinephelus striatus*
Ocean triggerfish, *Canthidermis sufflamen*
Porkfish, *Anisotremus virginicus*
Puddingwife, *Halichoeres radiatus*
Queen snapper, *Etelis oculatus*
Queen triggerfish, *Balistes vetula*
Red grouper, *Epinephelus morio*
Red hind, *Epinephelus guttatus*
Red porgy, *Pagrus pagrus*
Red snapper, *Lutjanus campechanus*
Rock hind, *Epinephelus adscensionis*
Rock Sea Bass, *Centropristis philadelphica*
Sailors choice, *Haemulon parra*
Sand tilefish, *Malacanthus plumieri*
Saucereye porgy, *Calamus calamus*
Scamp, *Mycteroperca phenax*
Schoolmaster, *Lutjanus apodus*
Scup, *Stenotomus chrysops*
Sheepshead, *Archosargus probatocephalus*
Silk snapper, *Lutjanus vivanus*
Smallmouth grunt, *Haemulon chrysargyreum*
Snowy grouper, *Epinephelus niveatus*
Spanish grunt, *Haemulon macrostomum*
Speckled hind, *Epinephelus drummondhayi*
Tiger grouper, *Mycteroperca tigris*
Tomtate, *Haemulon aurolineatum*
Yellow jack, *Carangoides bartholomaei*
Yellowedge grouper, *Epinephelus flavolimbatus*
Yellowfin grouper, *Mycteroperca venenosa*
Yellowmouth grouper, *Mycteroperca interstitialis*
Yellowtail snapper, *Ocyurus chrysurus*
Vermilion snapper, *Rhomboplites aurorubens*
Warsaw grouper, *Epinephelus nigritus*
White grunt, *Haemulon plumierii*
Whitebone porgy, *Calamus leucosteus*
*****Wreckfish, *Polyprion americanus*

This list shows the species included in the Snapper Grouper Fishery Management Unit.

***No actions in Amendment 17B are intended to change any regulations for wreckfish.**

Stock assessments, through the evaluation of biological and statistical information, provide an evaluation of stock health and directionality of overall stock health under the current management regime and other potential future harvest conditions. More specifically, the assessments provide an estimation of the maximum sustainable yield (MSY) and a determination of the stock status (whether overfishing is occurring and whether the stock is overfished). Following the assessment, the Council's Scientific and Statistical Committee (SSC) reviews the stock assessment information and advises the Council on whether the stock assessment was performed utilizing the best available data and whether the outcome of the assessment is suitable for management purposes.

A stock assessment can range from simple (evaluation of trends in catch, average fish length, and catch-per-unit-effort) to complex (statistical catch-at-age models). The type of assessment varies based on available data and available resources used to conduct an assessment. In 1998, 2001, and 2003, the Council evaluated annual reports on major snapper grouper species compiled by the NOAA/NMFS Laboratory in Beaufort, NC. These reports outlined trends in catch data and estimated spawning potential ratio (SPR) values for species in the snapper grouper fishery management unit (FMU). In addition, the Council received a report on stock status and control rule alternatives in 2001 (Powers 1999). More recent stock assessments have been performed through the Southeast Data, Assessment, and Review (SEDAR) program. Stock assessments have determined that 10 species in the snapper grouper fishery management unit (FMU) are undergoing overfishing (Table 1-1).

Table 1-1. Assessment information for 10 species in the snapper grouper fishery management unit undergoing overfishing.

Species	Most Recent Stock Assessment Source & Year Completed	Data Thru	Date SSC Approved	Overfishing?	Overfished?	Next Assessment Begins
Golden tilefish[1]	SEDAR 4 (2004)	2002	10/04	Yes	No	To Be Determined[2]
Snowy grouper[1]	SEDAR 4 (2004)	2002	10/04	Yes	Yes	To Be Determined[2]
Speckled hind	Potts and Brennan (2001)	1999	n/a	Yes	Unknown	To Be Determined[2]
Warsaw grouper	Huntsman *et al.* (1992)	1990	n/a	Yes	Unknown	To Be Determined[2]
Black grouper[1]	Potts and Brennan (2001)	1999	10/21/05	Yes	Unknown	2009
Black sea bass[1]	SEDAR Update 1 (2005)	2003	5/12/05	Yes	Yes	2010
Gag[1]	SEDAR 10 (2006)	2004	6/12/07	Yes	No	To Be Determined[2]
Red grouper[1]	Potts and Brennan (2001)	1999	10/21/05	Yes	Unknown	2009
Vermilion snapper[1]	SEDAR Update #3 (2007)	2006	6/12/07	Yes	Unknown	2012
Red snapper	SEDAR 15 (2008)	2006	6/11/08	Yes	Yes	2010

[1]Actions were implemented to reduce fishing mortality to a level expected to end overfishing. These stocks will be declared undergoing overfishing until a stock assessment confirms otherwise.
[2]Schedules for future stock assessments is under development by SEDAR.

History of Scoping
A Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement (DEIS) for Amendment 17 to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region was published January 22, 2008 [73 FR 3701]. Amendment 17 contained actions to establish ACLs and AMs for the 10 South Atlantic snapper grouper species undergoing overfishing. Scoping meetings for Amendment 17, using an associated scoping document, were held February 4-8 and 10-12, 2009.

After scoping for ACLs in Amendment 17 was completed, a NOI for Amendment 18 was published (April 7, 2008 [73 FR 18782]) to announce the development of a DEIS to analyze the establishment of a rebuilding plan for red snapper stock and various management measures to end its overfishing. Amendment 18 was scoped by the Council in April and May 2008. After scoping the issue of red snapper overfishing (Amendment 18), the Council decided it would be more appropriate to address all red snapper issues, i.e., ACLs, AMs, *and* overfishing in Amendment 17 even though they had been scoped individually.

After this determination was made, the Council decided to split Amendment 17 into Amendments 17A and 17B in order to deal with all actions relating to red snapper separately from the other nine species undergoing overfishing. Thus, Amendment 17A was created to deal only with overfishing, ACLs and AMs for red snapper, and Amendment 17B was created to establish ACLs, and AMs for gag, vermilion, red grouper, black grouper, snowy grouper, warsaw grouper, black sea bass, speckled hind, and golden tilefish. Additionally, the Regional Administrator determined the newly created Amendment 17B would be supported by an Environmental Analysis rather than an Environmental Impact Statement (EIS), and Amendment 17A (red snapper) would be supported by an EIS. Because all of the actions contained within what are now Amendments 17A and 17B were scoped under the original Amendment 17 and Amendment 18, NOAA Fisheries Service did not publish any additional or separate NOIs. Issues raised during the scoping process regarding red snapper or any other snapper grouper species undergoing overfishing are either addressed and/or analyzed in the supporting NEPA documentation for Amendments 17A and 17B.

1.2 Purpose and Need

1.2.1 Purpose

The purpose of this amendment is to establish annual catch limits (ACLs) and accountability measures (AMs), where needed, including management measures to reduce the probability that catches will exceed the stocks' ACLs pursuant to Reauthorized Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requirements. The Council will also consider the specification of annual catch targets (ACT) where necessary.

1.2.2 Background

Previously implemented snapper grouper amendments may contain management measures for species undergoing overfishing that are comparable to ACLs, AMs, and overfishing limits (OFLs). The status quo alternatives would retain management measures that are equivalent to OFLs, ACLs, and AMs specified by the Reauthorized Magnuson-Stevens Act and in the final NS1 guidelines and recommended by the Council's Scientific and Statistical Committee (SSC) for previous amendments. ACL and AM alternatives are provided for other snapper grouper species that are undergoing overfishing and currently have no applied regulations qualifying as ACLs or AMs. The SSC recommended at their December 2008 meeting that the acceptable biological catch (ABC) levels for snowy grouper, black sea bass, and red snapper be set consistent with the rebuilding plans for those species until they can be further amended based on better scientific information. At their December 2008 meeting, the SSC recommended that total landings equal zero for speckled hind and warsaw grouper. The SSC met in March and June 2009 to identify protocol for determining ABCs, which will be included in the Comprehensive ACL Amendment. At their June 2009 meeting, the SSC provided ABC recommendations for gag and vermilion snapper. For Gag, the ABC for 2010 includes 805,000 pounds gutted weight for landings, 80,000 pounds gutted weight for dead discards, and 885,000 pounds whole weight inclusive of landings and discards corresponding to a P* = 0.30 from "A probability-based approach to setting annual catch limits: Gag, *Mycteroperca microlepis*, off the Southeastern United States (Shertzer *et al.* 2008). For vermilion snapper, the SSC recommended ABC levels interpolated from Tables 3.19 and 3.20 of the Southeast Data Assessment and Review (SEDAR) vermilion assessment workshop report to obtain the P* value of 0.275. For 2010, this corresponds to 1,078,000 pounds whole weight for landings, 31,000 pounds whole weight for dead discards, and 1,109,000 pounds whole weight inclusive of landings and discards (SEDAR Update #3, 2007). The ABCs for landed catch for gag and vermilion snapper assumes the current level of discards would continue. The SSC stated at their March 2009 meeting that it does not support ABCs and ACLs that require the monitoring of discards in order to trigger AMs appropriate.

At their December 2009 meeting, the SSC recommended waiting for the results of the stock assessments for both black grouper and red grouper to determine ABC values for those species. The SSC did not provide an ABC value for golden tilefish because of the age of the assessment and lack of a current estimate of abundance.

Table 1-2. Values for Overfishing Level (OFL) and Acceptable Biological Catch (ABC) recommendations from the SSC.

Species	OFL	ABC
Black grouper[1]	none specified	none specified
Black sea bass	OFL = Yield at MFMT	ABC = rebuilding plan[2] 847,000 lbs ww 717,797 lbs gw
Gag[1]	OFL = Yield at MFMT	805,000 lbs gw (landed catch)[3] 885,000 lbs gw (total kill)
Golden tilefish[1]	none specified	none specified
Red grouper[1]	none specified	none specified
Snowy grouper	OFL = Yield at MFMT	ABC = rebuilding plan[4] 102,960 lbs ww 87,254 lbs gw
Speckled hind[5]	SSC Recommendation=Unknown	0 (landings only)
Vermilion snapper[6]	none specified	1,078,000 lbs ww (landed catch)[6] 1,109,000 lbs ww (total kill)
Warsaw grouper[5]	SSC Recommendation=Unknown	0 (landings only)

1. At their June 2008 meeting, the SSC withdrew OFL and ABC levels for black grouper, gag, golden tilefish, red grouper, and vermilion snapper. The previous recommendations were developed at their June 2007 meeting.
2. At their June 2008 meeting, the SSC recommended that the ABC levels for black sea bass be set consistent with the rebuilding plan until it can be further amended based upon better scientific information. Through Amendment 15A, the Council established a TAC of 847,000 lbs whole weight (717,797 lbs gutted weight) based upon the rebuilding plan. The rebuilding plan was based on a constant catch strategy and set levels equal to the yield at OY in a rebuilding fishery.
3. In December 2007, the SSC motion indicated that the values for gag are ABC=694,000 pounds and OFL=yield at MFMT. In June 2008, the SSC stated that for species assessed through SEDAR, ABC=yield at 75%F_{MSY} and OFL=yield at MFMT. In December 2008, the SSC withdrew the ABC and OFL recommendations for gag established at the June 2008 meeting. The SSC previously specified MFMT for gag in Amendment 16. At their June 2009 meeting, the SSC recommended an ABC = 805,000 pounds gutted weight in landed catch and 80,000 dead discarded fish.
4. At their June 2008 meeting, the SSC recommended that the ABC levels for snowy grouper be set consistent with the rebuilding plan until it can be further amended based upon better scientific information. Through Amendment 15A, the Council established a TAC of 102,960 lbs whole

weight (87,254 lbs gutted weight) based upon the rebuilding plan. The rebuilding plan was based on a constant catch strategy and set levels equal to the yield at OY in a rebuilding fishery.

5. At their December 2008 meeting, the SSC recommended an ABC = 0 (landings only) for speckled hind and warsaw grouper.
6. In December 2007, the SSC motion indicated that the values for vermilion snapper are ABC=628,459 pounds and OFL=yield at MFMT. In June 2008, the SSC stated that for species assessed through SEDAR, ABC=yield at 75%F_{MSY} and OFL=yield at MFMT. A new age-based assessment was completed for vermilion snapper in 2008. In December 2008, the SSC withdrew the ABC and OFL recommendations for vermilion established at the June 2008 meeting. The SSC previously specified MFMT for vermilion snapper in Amendment 16. At their June 2009 meeting, the SSC recommended an ABC = 1,109,000 lbs whole weight inclusive of landings and dead discards. The landed portion of this ABC is 1,078,000 lbs whole weight.

To summarize, actions proposed in Amendment 17B would:

- 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;
- Specify allocations for golden tilefish;
- Update the framework procedure for specification of TAC.

ACLs , ACTs, and AMs

Revisions to the Magnuson-Stevens Act in 2006 require that by 2010, Fishery Management Plans (FMPs) for fisheries determined by the Secretary to be subject to overfishing must establish a mechanism for specifying ACLs at a level that prevents overfishing and does not exceed the recommendations of the respective Council's SSC or other established peer review processes. These FMPs also are required to establish within this timeframe measures to ensure accountability. AMs are management controls that ensure that the ACLs are not exceeded; examples include corrective measures if overages occur and implementation of an in-season monitoring program. By 2011, FMPs for all other fisheries, except fisheries for species with annual life cycles, must meet these requirements.

The Council is employing a step-wise decision-making process in setting ACLs, ACTs, and management measures to ensure harvest is at or below the ACL (Figure 1-2). The SSC is expected to specify OFLs and ABC recommendations in the future based on criteria specific to levels of data availability. The ACL is the annual catch limit expressed in pounds or numbers of fish that serves as the basis for invoking accountability measures. Setting the ACL provides an opportunity to divide the total ACL into sector-specific ACLs but is not required. The ACT is the target specified in pounds or numbers of fish. Specifying an ACT is optional and up to the discretion of the Council. Catch includes fish that are retained for any purpose, as well dead discards. For fisheries where bycatch estimates are not available in a timely enough manner to manage annual catch, targets may be specified for landings, as long as an estimate of bycatch is accounted for such that total of landings and bycatch will not exceed the stock's ACL.

The final NS1 guidelines recognizes that existing FMPs may use terms and values that are similar to, associated with, or may be equivalent to OFL, ABC, ACL, ACT, and AM in many fisheries for which annual specifications are set for different stocks or stock complexes. In these situations the guidelines suggest that, as Councils revise their FMPs, they use the same terms as set forth in the NS1 guidelines. Therefore, Amendment 17B will include a discussion of existing harvest level designations which could be used by the Council to specify OFLs, ABCs, ACLs, ACTs, and AMs.

AMs are designed to provoke an action once either the ACL or ACT is reached during the course of a fishing season to reduce the risk overfishing will occur. However, depending on how timely the data are, it might not be realized that either the ACL and/or ACT has been reached until after a season has ended. Such AMs include prohibited retention of species once the sector ACT is met, shortening the length of the subsequent fishing season to account for overages of the ACL, and reducing the ACT in the subsequent fishing season to account for overages of the ACL.

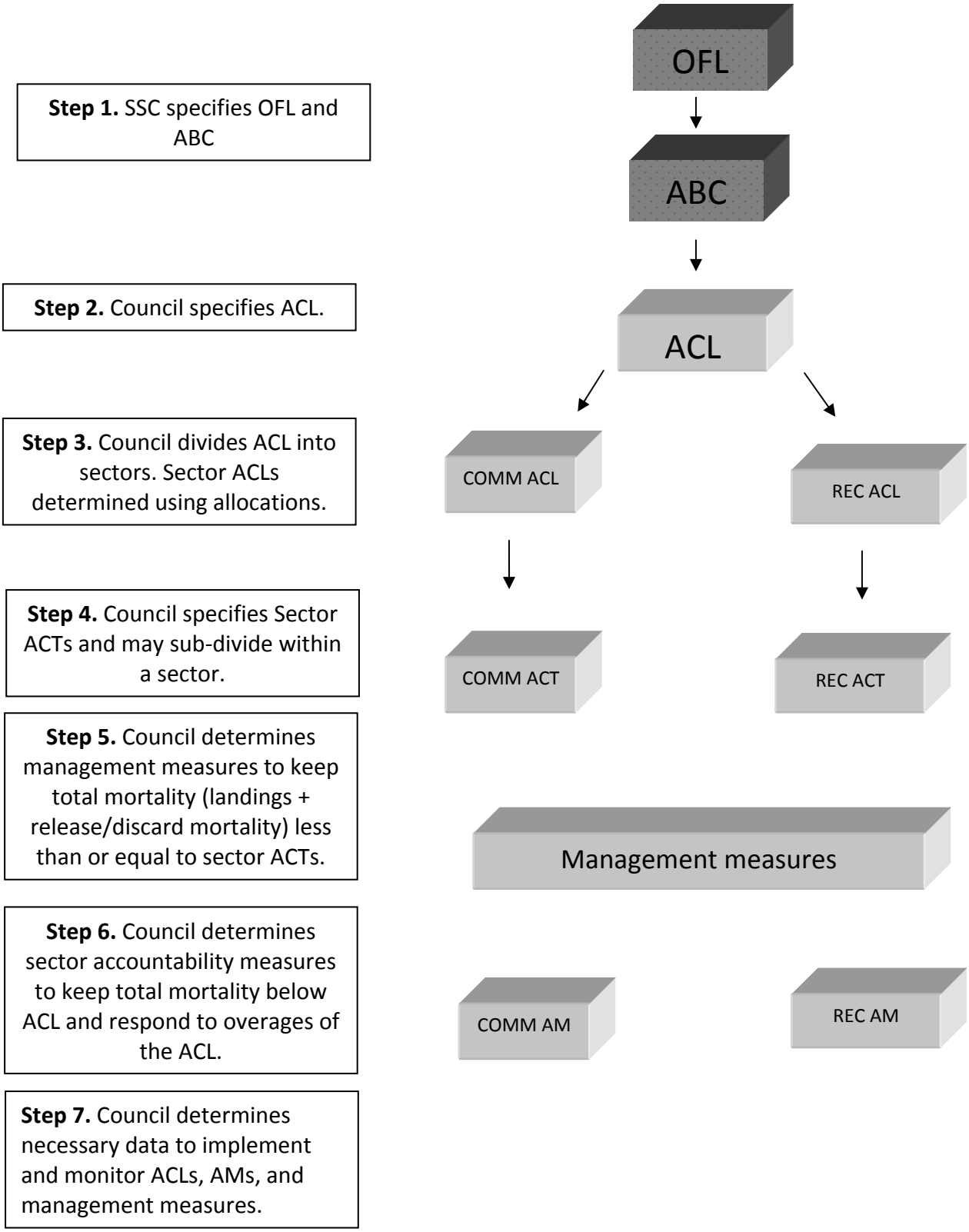


Figure 1-2. The tiering process employed in Snapper Grouper Amendment 17B.

Modify management measures as needed to limit harvest to the ACL or ACT

The Council is responsible for implementing regulations that ensure annual catches do not exceed the ACL to ensure overfishing does not occur. The Council will consider alternatives that could adjust management measures for species currently identified as experiencing overfishing.

The Council proposes to implement restrictions to fishing activity in the deepwater fishery due to management uncertainty (e.g., lack of sufficient information about catch) and low levels of available harvest. More specifically, the Council is proposing to adjust management measures for the deepwater fishery based upon the following information: (1) the SSC's recommendation of ABC = 0 landings for speckled hind and warsaw grouper; (2) a recreational ACL of 523 fish for snowy grouper; (3) a 100% release mortality rate of deepwater fish in a multi-species fishery; and (4) restrictions on NOAA Fisheries Service to monitor mortality imposed on the fishery by the recreational sector. The Council's objective is to implement a management plan to ensure that fishing mortality does not exceed the ACLs.

Update the Framework Procedure for Specification of TAC

The Council is proposing the establishment of ACLs and Annual Catch Targets (ACTs), where needed. Currently, the framework procedure specifies that if changes are needed to the TAC, the Council will advise the Regional Administrator in writing of their recommendations accompanied by the Group's report (where appropriate), relevant background material, draft regulations, Regulatory Impact Review, and public comments. The Council is updating the procedures for specification of TAC in order to incorporate the ACL, ACT, and AM vernacular.

1.3 History of Management

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.

Table 1-3. History of management.

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 (1986)	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 (1988b)	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 (1988a)	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 (1990)	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 (1991)	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 (1992)	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 (1992)	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	-commercial quotas for snowy grouper, golden tilefish -commercial trip limits for snowy grouper, golden tilefish, speckled hind, and warsaw grouper -include 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 (1994)	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 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 #8 (1997)	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 (1998)	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 (1998) resubmitted	10/13/00	PR: 63 FR 63276 FR: 65 FR 55203	-Commercial trip limit for greater amberjack
Regulatory Amendment #8 (2000)	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 (1998)	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 (1998d)	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 (2000)	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 (2003)	04/26/04	PR: 68 FR 66069 FR: 69 FR 15731	-Extended for an indefinite period the regulation prohibiting fishing for and possessing snapper grouper 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 in year 3 onwards.

Document	All Actions Effective By:	Proposed Rule Final Rule	Major Actions. Note that not all details are provided here. Please refer to Proposed and Final Rules for all impacts of listed documents.
			Recreational: Limit possession to one snowy grouper in 5 grouper per person/day aggregate bag limit. 2. Golden Tilefish Commercial: Quota of 295,000 lbs gw, 4,000 lbs gw trip limit until 75% of the quota is taken when the trip limit is reduced to 300 lbs gw. Do not adjust the trip limit downwards unless 75% is captured on or before September 1. Recreational: Limit possession to 1 golden tilefish in 5 grouper per person/day aggregate bag limit. 3. Vermilion Snapper Commercial: Quota of 1,100,000 lbs gw. Recreational: 12" 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)	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 (2007)	3/14/08	73 FR 14942	- Establish rebuilding plans and SFA parameters for snowy grouper, black sea bass, and red porgy.
Amendment #15B (2008b)	02/15/10	PR: 74 FR 30569 FR: 74 FR 58902	- Prohibit the sale of bag-limit caught snapper grouper species. -Reduce the effects of incidental hooking on sea turtles and smalltooth sawfish. - Adjust commercial renewal periods and transferability

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.
			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 2008c)	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 = 315,523 pounds gutted weight and July-Dec. = 302,523 pounds gutted weight; recreational allocation = 307,315 pounds gutted weight; reduce rec. bag limit from 10 to 5 and a rec. closed season Nov. through March. The NMFS RA was authorized to set new regulations based on results of the new stock assessment. -Require dehooking tools.
Red Snapper Interim Rule	1/4/09	TR: 74 FR 63673	-Prohibit all harvest, possession, and retention of red snapper in the SAFMC's EEZ.
Amendment #17A (TBD)	TBD	TBD	-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
Amendment #17B (TBD)	TBD	TBD	-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	TBD	-Establishes a control date for the golden tilefish fishery of the South Atlantic.
Notice of Control Date	12/4/08	TBD	-Establishes control date for black sea bass pot fishery of the South Atlantic.
Amendment 18 (TBD)	TBD	TBD	-Extend the range of the snapper-grouper FMP north -Limit participation and effort in the golden tilefish fishery -Modifications to management of the black sea bass pot fishery -Separate snowy grouper quota into regions/states -Change the golden tilefish fishing year -Improve the accuracy, timing, and quantity of fisheries statistics -Designate EFH in new northern areas

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 19 (2009)	TBD	TBD	-Establish deepwater coral HAPCs
Amendment 20	TBD	TBD	-Update wreckfish ITQ according to Reauthorized Magnuson-Stevens Act -Establish ACLs, AMs, and management reference points for wreckfish fishery
Comprehensive ACL Amendment	TBD	TBD	-Establish ABC control rules, establish ABCs, ACTs, and AMs for species not undergoing overfishing -Remove some species from South Atlantic FMUs -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 ACTs

1.4 Management Objectives

Objectives of the Snapper Grouper FMP, as modified by Amendment 8 (SAFMC 1997), are shown below. In addition, the Council has added two new objectives (#14 and #15 below).

1. Prevent overfishing.
2. Collect necessary data.
3. Promote orderly utilization of the resource.
4. Provide for a flexible management system.
5. Minimize habitat damage.
6. Promote public compliance and enforcement.
7. Mechanism to vest participants.
8. Promote stability and facilitate long-run planning.
9. Create market-driven harvest pace and increase product continuity.
10. Minimize gear and area conflicts among fishermen.
11. Decrease incentives for overcapitalization.
12. Prevent continual dissipation of returns from fishing through open access.
13. Evaluate and minimize localized depletion.
14. **End overfishing of snapper grouper stocks undergoing overfishing.**
15. **Rebuild stocks declared overfished.**

2 Actions and Alternatives

Alternatives considered by the Council in this amendment and a comparison of their environmental consequences is outlined in **Section 2.1** (described in detail in **Section 4.0**). These alternatives were identified and developed through multiple processes, including the scoping process, public hearings and/or comments, interdisciplinary plan team meetings, and meetings of the Council, the Council's Snapper Grouper Committee, Snapper Grouper Advisory Panel, and Scientific and Statistical Committee. Species affected by the proposed actions and alternatives below include: Golden tilefish, speckled hind, warsaw grouper, snowy grouper, black grouper, black sea bass, gag, red grouper, and vermilion snapper. Alternatives the Council considered but eliminated from detailed study during the development of this amendment are described in **Appendix A**.

*Note: It is the Council's intent that all recreational closures in the South Atlantic are associated with a possession limit of zero on board a vessel for which any valid federal South Atlantic Snapper-Grouper Permit has been issued, regardless of where such species were harvested, i.e., in state or federal waters.

2.1 Speckled hind/warsaw grouper

Alternative 1 (Status Quo). Retain existing regulations for deepwater species (snowy grouper, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper) (Tables 4-2 and 4-3). Do not specify commercial and recreational ACLs, ACTS, or AMs. Existing regulations include: 622.32(4)(c)(3). One speckled hind per vessel per trip included in the 3 grouper aggregate bag limit, and one warsaw grouper per vessel per trip included in the 3 grouper aggregate bag limit. 622.45(d)(4) A warsaw grouper or speckled hind in or from the South Atlantic EEZ may not be sold or purchased.

Alternative 2. Establish an ACL = 0 (landed catch only) for speckled hind and warsaw grouper. Prohibit all commercial and recreational fishing for, possession, and retention of speckled hind and warsaw grouper.

Alternative 3. Establish an ACL = 0 (landed catch only) for speckled hind and warsaw grouper. Prohibit all commercial and recreational fishing for, possession, and retention of speckled hind and warsaw grouper as well as other deepwater species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper).

Alternative 4 (Preferred). Establish an ACL = 0 (landed catch only) for speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of speckled hind and warsaw grouper. Prohibit fishing for, possession, and retention of other deepwater snapper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) beyond a depth of 240 feet (40 fathoms; 73 m).

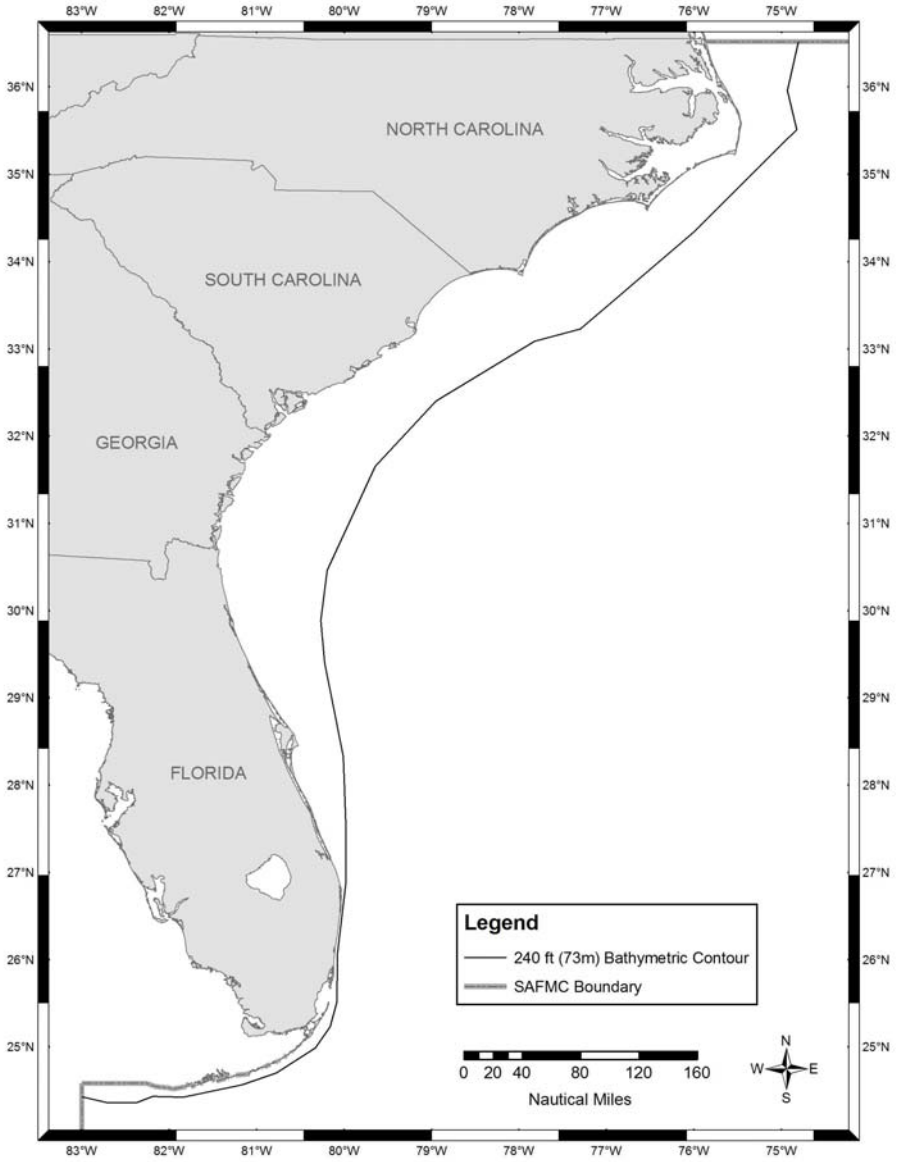


Figure 2-1, Generalized 240 ft. depth contour line see Table 2-1 for waypoints used in this boundary.

Table 2-1. Waypoints used to delineate generalized 240 ft. boundary.

Point	Latitude N (Degrees Minutes Seconds)	Longitude W (Degrees Minutes Seconds)
1	36°31'01"	74°48'10"
2	35°57'29"	74°55'49"
3	35°30'49"	74°49'17"
4	34°19'41"	76°00'21"
5	33°13'31"	77°17'50"
6	33°05'13"	77°49'24"
7	32°24'03"	78°57'03"
8	31°39'04"	79°38'46"
9	30°27'33"	80°11'39"
10	29°53'21"	80°16'01"
11	29°24'03"	80°13'28"
12	28°19'29"	80°00'27"
13	27°32'05"	79°58'49"
14	26°52'45"	79°58'49"
15	26°03'36"	80°04'33"
16	25°31'03"	80°04'55"
17	25°13'44"	80°09'40"
18	24°59'09"	80°19'51"
19	24°42'06"	80°46'38"
20	24°33'53"	81°10'23"
21	24°25'20"	81°50'25"
22	24°25'49"	82°11'17"
23	24°21'35"	82°22'32"
24	24°21'29"	82°42'33"
25	24°25'37"	83°00'00"

Alternative 5. Establish an ACL = 0 (landed catch only) for speckled hind and warsaw grouper, and prohibit all fishing for, possession, and retention of speckled hind and warsaw grouper. regardless of depth where caught. Prohibit all fishing for, possession and retention of other deepwater snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) beyond a depth of 300 feet (50 fathoms; 92 m).

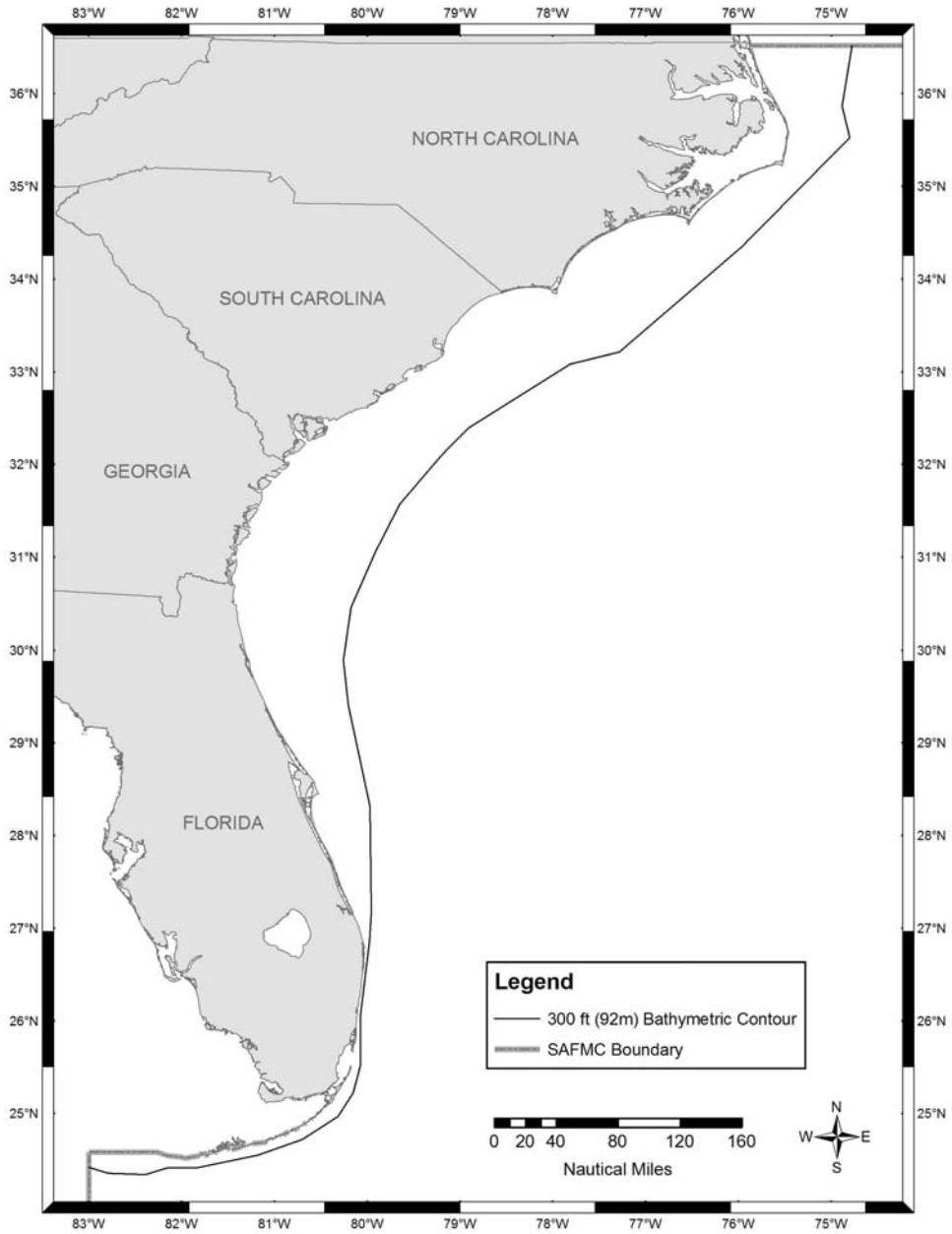


Figure 2-2. Generalized 300 ft. depth contour line see Table 2-2 for the waypoints used in this boundary.

Table 2-2. Waypoints used to delineate generalized 300 ft boundary.

Point	Latitude N (Degrees Minutes Seconds)	Longitude W (Degrees Minutes Seconds)
1	36°31'01"	74°46'21"
2	35°51'59"	74°52'52"
3	35°31'36"	74°47'57"
4	34°20'35"	75°57'53"
5	33°12'48"	77°16'60"
6	33°04'48"	77°48'37"
7	32°23'28"	78°54'32"
8	32°06'03"	79°11'41"
9	31°34'08"	79°38'57"
10	31°03'17"	79°54'37"
11	30°27'19"	80°10'34"
12	29°53'31"	80°15'25"
13	29°24'24"	80°12'13"
14	28°18'51"	79°58'12"
15	27°10'16"	79°57'23"
16	26°51'22"	79°58'25"
17	26°03'30"	80°04'19"
18	25°31'19"	80°04'28"
19	25°13'28"	80°09'02"
20	24°57'56"	80°18'48"
21	24°43'11"	80°41'59"
22	24°33'04"	81°10'52"
23	24°24'50"	81°50'05"
24	24°24'50"	82°09'16"
25	24°20'29"	82°23'23"
26	24°21'15"	82°47'46"
27	24°24'55"	83°00'00"

2.1.1 Comparison of Alternatives

Alternative 1 (Status Quo) would have the smallest positive biological effect on the species, and would incur the least socioeconomic impact relative to **Alternatives 2-5**, which would specify an ACL of 0 landed catch for speckled hind and warsaw grouper. Biologically, **Alternatives 2-5** would have a greater positive impact compared to **Alternative 1 (Status Quo),** since harvest of speckled hind and warsaw grouper would

be prohibited and total mortality would be limited to that related only to discards. However, it is possible that prohibiting the harvest of speckled hind and warsaw grouper alone without prohibiting the harvest of co-occurring species would not reduce fishing mortality enough to end overfishing of the species due to discard mortality, as would be the case under **Alternative 2**. **Alternative 3** would provide a greater biological benefit over **Alternative 2** because it would prohibit the harvest of *all* deepwater snapper grouper species that co-occur with adult speckled hind and warsaw grouper. Closing the area beyond 240 feet **(Alternative 4 (Preferred)** to deepwater snapper grouper fishing would provide protection to the largest, most fecund fish and ensure a natural sex ratio into the future. Speckled hind are thought to form spawning aggregations, which can be susceptible to targeted fishing pressure (G. Gilmore, Dynamac Corporation, personal communication). Prohibiting all harvest of deepwater snapper grouper species beyond 240 feet would also protect these spawning aggregations, as well as, decrease bycatch mortality of speckled hind, warsaw grouper, and other co-occurring deepwater snapper grouper species. The biological effects of **Alternative 5** would be very similar to those under **Alternative 4 (Preferred)**. However, under **Alternative 5** the prohibition on fishing for deepwater species and associated protections would be pushed out to 300 ft. Overall biological benefits would be slightly less under **Alternative 5** when compared to the preferred alternative.

Economically, the most negative impact would be incurred under **Alternative 3**, whereas the least negative impact would be expected under **Alternative 1**. Administratively, **Alternatives 2** and **3** would produce equally negative administrative impacts relative to each other; however, such impacts would be minimal. **Alternative 4 (Preferred)** is likely to yield biological benefits that are slightly less than **Alternative 3**, but **Alternative 4 (Preferred)** would have a lower negative socioeconomic impact than **Alternative 3** since it would allow fishing in waters shallower than 240 ft. Administratively, **Alternative 4 (Preferred)** is the most burdensome since a boundary would need to be monitored for deepwater grouper fishing violations.

Alternative 1 (Status Quo) is not a viable alternative because it would not establish required components of FMPs. **Alternative 4 (Preferred)** would be expected to result in greater adverse social effects than **Alternative 2**, because it would also prohibit the harvest of additional deepwater species, but fewer adverse social effects than **Alternative 3** because only harvests of these additional species from deeper waters would be prohibited. Because **Alternative 5** would impose less severe harvest restrictions than **Alternative 4 (Preferred)**, it would be expected to result in lower adverse social effects relative to **Alternative 4 (Preferred)**.

2.2 Golden Tilefish

2.2.1 Golden Tilefish Allocations

Alternative 1 (Status Quo). Do not define allocations for golden tilefish.

Alternative 2. Define allocations for golden tilefish based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on landings from the years 2006-2008. The allocation would be 96% commercial and 4% recreational.

Alternative 3. (Preferred) Define allocations for golden tilefish based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on the following formula for each sector: Sector apportionment = (50% * average of long catch range (lbs) 1986-2008) + (50% * average of recent catch trend (lbs) 2006-2008). The allocation would be 97% commercial and 3% recreational.

Alternative 4. Split the allocations for golden tilefish equally among the two sectors. The allocation would be 50% commercial and 50% recreational.

2.2.1.1 Comparison of Alternatives

Alternative 1 (Status Quo) would not specify a commercial or recreational allocation for golden tilefish. If an allocation was not specified then it would not be possible to identify the ACL in the recreational sector. Allocation **Alternatives 2-4** would range from 50% commercial/50% recreational (**Alternative 4**) to 97% commercial/3% recreational (**Alternatives 3 (Preferred)**). Alternatives that allocate a greater portion of the harvest to the commercial sector could have a greater negative impact on habitat since golden tilefish are predominately taken with longline gear, which is considered to do greater damage to hard bottom habitat than vertical hook and line gear (SAFMC 2007). However, damage to bottom habitat with longline gear has not been very well documented and fishermen target golden tilefish on mud bottom. **Alternative 4** would divide golden tilefish allocations equally among the recreational and commercial sectors. This could result in a substantial reduction in the commercial harvest while allowing a potential increase in recreational harvest that may not be attainable with the current restriction of one fish per person per day. As a result, an overall decrease in harvest of golden tilefish could occur under **Alternative 4** resulting in biological benefits for the species. Therefore, the biological benefit of **Alternative 4** would exceed all other alternatives, while there would be little difference among **Alternatives 2** and **3**.

Alternative 1 (Status Quo) is not a viable alternative because it would not support sufficient sector monitoring and management consistent with the needs of ACLs and AMs. The expected social effects of **Alternative 2** and **Alternative 3 (Preferred)** would be expected to be virtually indistinct because each would establish allocations that effectively mirror historic harvest patterns. **Alternative 4** would result in the greatest

deviation from historic harvest patterns and, as a result, would be expected to result in the greatest adverse social effects.

2.2.2 Golden Tilefish ACLs and AMs

Alternative 1 (Status Quo). Retain existing regulations for golden tilefish. The commercial ACL, based on the commercial quota (currently set at the F_{MSY} level), equals 331,000 lbs ww (295,000 lbs gw). The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is projected to be met. All purchase and sale is prohibited when the quota is projected to be met. Do not implement ACLs or AMs for the recreational sector.

Alternative 2 (Preferred). Establish the ACL at the F_{OY} level (Total ACL = 326,554 lbs whole weight or 291,566 lbs gutted weight). The commercial ACL (282,819 lbs gw) is based on the allocation alternative selected (97% commercial: 3% recreational). The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is projected to be met. All purchase and sale is prohibited when the quota is projected to be met.

Specify a recreational ACL in numbers of fish (1,578 fish) based upon the allocation decision (97% commercial 3% recreational) and the yield at F_{OY}. Implement accountability measures (AMs) for the recreational sector for golden tilefish. If the ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing season by the amount necessary to ensure landings do not exceed the 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 3. Establish a *single* ACL (commercial and recreational) using the total of the commercial ACL (quota) at the F_{OY} level and the recreational allowable harvest at the OY level. The total ACL would be 326,554 lbs ww (291,566 lbs gw). The AM would prohibit harvest in the commercial and recreational sectors when the ACL is projected to be met.

Alternative 4. Establish a recreational accountability measure that would implement a 1 golden tilefish *per vessel* per day when the *single* ACL (the total of the commercial ACL (quota) at the F_{OY} level and the recreational allowable harvest at the OY level, 326,554 lbs ww (291,566 lbs gw), is projected to be met.

Alternative 5. Establish an ACL (commercial and recreational) based on the yield at F_{OY} for the commercial fishery (Table 2-3). The AM for the commercial and recreational sectors is to prohibit harvest, possession, and retention in both sectors when commercial landings exceed the ACL.

*Note: It is the Council's intent that all recreational closures in the South Atlantic are associated with a possession limit of zero on board a vessel for which any valid federal South Atlantic Snapper-Grouper Permit has been issued, regardless of where such species were harvested, i.e., in state or federal waters.

Table 2-3. Commercial quota (ACL) and recreational ACL for **Alternatives 2** and **5** under the various allocation alternatives specified in **Section 2.2.1.**

Allocation (Comm/Rec)	Comm ACL (quota) (lbs) gw OY	Rec ACL lbs (gw) (OY)	Rec ACL number (OY)
Alternative 2 (96%/4%)	279,903	11,663	2,103
Alternative 3 (**Preferred**) (97%/3%)	282,819	8,747	1,578
Alternative 4 (50%/50%)	145,783	145,783	26,293

2.2.2.1 Comparison of Alternatives

Alternative 1 (Status Quo) would maintain the current golden tilefish quota based on the yield at F_{MSY}, which would serve as the golden tilefish ACL for the commercial sector. It would also maintain the prohibition on all commercial fishing for golden tilefish once the quota is met; thereby, acting as a commercial AM; however, there would not be any recreational AMs. **Alternatives 2 (Preferred), 3,** and **5** would establish ACLs based on the yield associated with F_{OY}, which is a more conservative approach since F_{OY} is 75% of F_{MSY}. **Alternative 2 (Preferred)** would also implement AMs for the recreational sector. Under **Alternatives 2 (Preferred)** and **5** the current commercial quota, which is 295,000 lb gutted weight, would depend on the preferred allocation alternative and is specified in Table 2-3. Under **Alternative 3,** the total commercial and recreational ACL would be 291,566 lbs gutted weight. These reductions would likely yield more biological benefits than **Alternatives 1 (Status Quo)** and **4**; however, negative socioeconomic impacts would be incurred proportionate to the level of respective harvest reductions. Furthermore, under **Alternatives 4** and **5**, if commercial fishermen met the quota early in the year and the ACL in the various alternatives was met, it could reduce the chance for recreational fishermen to catch golden tilefish during the period of the year when they have historically targeted the species.

Alternative 1 (Status Quo) would allow the largest total harvest, which would suggest the greatest amount of social benefits as long as the stock is adequately protected, but equity issues would be expected to arise as the recreational sector would not be subjected to the same harvest control or accountability measures as the commercial sector. **Alternative 2 (Preferred)** would establish limits and sector-specific accountability measures, eliminating the equity issues of **Alternative 1 (Status Quo)**, but would reduce the overall allowable harvest. Although **Alternative 3** would allow the same total

harvest as **Alternative 2 (Preferred)**, it would be expected to result in lower social benefits because it would allow one sector to gain at the expense of the other and would require no individual sector accountability. **Alternative 4** would be expected to result in greater social benefits than **Alternative 3** in the short-term, but may result in greater adverse long-term effects if harvest overages degrade the resource. **Alternative 5** may result in the lowest social benefits of all the alternatives considered because of the possibility that the fishery may be restricted to half of its total annual average historic harvests.

2.3 Snowy grouper

Alternative 1 (Status Quo). Retain existing regulations for snowy grouper. The commercial ACL (82,900 lbs gutted weight) is based on the current TAC of 102,960 lbs whole weight (87,254 lbs gutted weight), which is based on the yield at F_{OY}. The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is projected to be met. All purchase and sale is prohibited when the quota is projected to be met. The recreational ACL equals 523 fish. Do not implement AMs for the recreational sector. Do not implement an ACT for the commercial or recreational sector.

Alternative 2 (Preferred). Establish a recreational daily bag limit of 1 snowy grouper *per vessel*. Implement Accountability Measures (AMs) for the recreational sector for snowy grouper. If the recreational ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing season by the amount necessary to ensure landings do not exceed the recreational 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 3. Establish a single ACL (commercial and recreational) based on the current TAC of 102,960 lbs whole weight (87,254 lbs gutted weight). The AM for both sectors would be a closure when the ACL is projected to be met.

Alternative 4. Establish a recreational AM that would implement a 1 snowy grouper *per vessel* limit when the ACL (the commercial quota) is projected to be met. The AM for the commercial sector would be closure when the quota is projected to be met.

*Note: It is the Council's intent that all recreational closures in the South Atlantic are associated with a possession limit of zero on board a vessel for which any valid federal South Atlantic Snapper-Grouper Permit has been issued, regardless of where such species were harvested, i.e., in state or federal waters.

2.3.1 Comparison of Alternatives

Under **Alternative 1 (Status Quo)** the catch level for snowy grouper in 2009 would approximate the yield at 75% F_{MSY} and would drop below that level as the stock rebuilds. **Alternative 1 (Status Quo)** would implement a prohibition on harvest once the quota is projected to be met with no designation of a recreational AM, and would end overfishing and satisfy the requirements of the Reauthorized Magnuson-Stevens Act. **Alternative 2 (Preferred)** would establish a recreational bag limit of 1 snowy grouper per vessel, and would allow the Regional Administrator to reduce the length of the following fishing year to compensate if the recreational ACL (under **Alternative 1 (Status Quo)**) is exceeded. The commercial AM under **Alternative 2 (Preferred)** would be a closure of the commercial fishery when the quota is projected to be met.

Socioeconomic impacts under **Alternative 3** would be approximately the same as those under **Alternative 2 (Preferred).** However, the Regional Administrator would not be able to take any action to compensate for any ACL overages in the following fishing year; therefore, **Alternative 3** may yield slightly less biological benefits than **Alternative 2 (Preferred).**

Alternative 4 would establish a recreational accountability measure that would implement a 1 snowy grouper per vessel limit when the commercial quota is projected to be met. As some recreational harvest would be allowed after the ACL is met, the biological benefits, of **Alternative 4** would be less than **Alternatives 2 (Preferred)** and **3**, and about the same as **Alternative 1 (Status Quo)**. **Alternative 4** would incur less negative socioeconomic impacts than **Alternatives 2** and **3**, and would likely be comparable to those under **Alternative 1 (Status Quo)**.

Alternative 1 (Status Quo) would allow the same total harvest as **Alternative 2 (Preferred)** and **Alternative 3**, but would be expected to invoke equity issues as the recreational sector would not be subjected to the same harvest control or accountability measures as the commercial sector. **Alternative 2 (Preferred)** would establish limits and sector-specific accountability measures and eliminate the equity issues of **Alternative 1 (Status Quo)**. Although **Alternative 3** would allow the same total harvest as **Alternative 2 (Preferred)** (and **Alternative 1 (Status Quo)**), it would be expected to result in lower social benefits because it would allow one sector to gain at the expense of the other and would require no individual sector accountability. **Alternative 4** would be expected to result in greater social benefits than **Alternative 3** in the short-term, but may result in greater adverse long-term effects if harvest overages degrade the resource.

2.4 Black grouper, black sea bass, gag, red grouper, and vermilion snapper

Alternative 1 (Status Quo). Retain existing regulations for black grouper, black sea bass, gag, red grouper, and vermilion snapper.

Table 2-4. Current commercial and recreational ACLs in pounds gutted weight (gw) for black sea bass, gag, and vermilion snapper.

Species	Commercial ACL	Recreational ACL
Black sea bass	309,000 lbs gutted weight	409,000 lbs gutted weight
Gag[1]	352,940[1] gutted weight	340,060[1] gutted weight
Black grouper	None	None
Red grouper	None	None
Vermilion snapper [2]	315,523 lbs gutted weight (January – June) and 302,523 lbs gutted weight (July – December) [2]	307,315 lbs gutted weight[2]

[1]Amendment 16 established gag commercial and recreational ACLs of 352,940 lbs gutted weight and 340,060 lbs gutted weight, respectively.
[2]Amendment 16 implemented vermilion snapper commercial ACL of 315,523 lbs gutted weight (January – June) and 302,523 lbs gutted weight (July – December) and a recreational ACL of 307,315 lbs gutted weight.

Table 2-5. Current commercial regulations for shallow water and mid-shelf species.

COMMERCIAL REGULATIONS						
Species	Size Limit	Limited Access	Gear Restrictions	Annual Quota	Seasonal Closures	Area Closures
Black Grouper	24" TL	√	√		Jan-Apr[2]	√
Black Sea Bass	10" TL	√	√	309,000 lbs[1]		√
Gag	24" TL	√	√	416,469 lbs ww 352,940 lbs gw[2]	Jan-Apr[2]	√
Red Grouper	20" TL	√	√		Jan-Apr[2]	√
Vermilion Snapper	12" TL	√	√	315,523 lbs gw (Jan-June) 302,523 lbs gw (July-Dec) [2]		√
Red Snapper	20" TL	√	√			√
[1]Based on TAC of 718,000 lbs gutted weight (847,000 lbs whole weight). [2]Implemented in July 2009 through Snapper Grouper Amendment 16.						

Table 2-6. Current recreational regulations for shallow water and mid-shelf species.

RECREATIONAL REGULATIONS						
Species	Allowable Catch	Size Limit	Gear Restrictions	Possession Limit	Seasonal Closures	Area Closures
Black Grouper		24" TL	√	No more than 1 black grouper and/or gag individually or in combination (included in 3 grouper per person per day)[1,2]	Jan-Apr[1]	√
Black Sea Bass	409,000 lbs gw[3]	12" TL	√	Daily bag limit = 15		√
Gag		24" TL	√	No more than 1 black grouper and/or gag individually or in combination (included in 3 grouper per person)[1,2]	Jan-Apr[1]	√
Red Grouper		20" TL	√	Included in 3 grouper per person per day[1,2]	Jan-Apr[1]	√
Vermilion Snapper		12" TL	√	5 (in addition to the aggregate snapper bag limit of 5) [1,2]	Nov-Mar[1]	√
Red Snapper		20" TL	√	2 per person per day (included in the 10 aggregate snapper per person limit)[1,2]		√

[1]Implemented in July 2009 through Snapper Grouper Amendment 16.
[2]Exclude the captain and crew on for-hire vessels from possessing a bag limit for groupers.
[3]Based on TAC of 718,000 lbs gutted weight (847,000 lbs whole weight).

ACLs

The commercial and recreational ACLs are specified in Table 2-4. The ACLs for black sea bass are based on a constant catch rebuilding strategy. The gag and vermilion snapper ACLs are based on the yields at F_{OY} and would remain in effect beyond 2009 until modified. The ACLs for black grouper and red grouper have not been specified.

AMs

The commercial AM for black sea bass, gag, and vermilion snapper is to prohibit harvest, possession, and retention when the quota for each species is projected to be met. The commercial AM for black grouper and red grouper is to prohibit harvest, possession, and retention when the quota for gag is projected to be met. All purchase and sale is prohibited when a quota is projected to be met. There are no recreational AMs for black grouper, black sea bass, gag, red grouper, and vermilion snapper.

ACTs

ACTs are not specified in the commercial or recreational sectors for black grouper, black sea bass, gag, red grouper, and vermilion snapper.

ACL Alternatives

Alternative 2. Establish commercial and recreational ACLs.

Alternative 2a. The commercial and recreational ACLs for black grouper are 86,886 lbs gutted weight and 31,863 lbs gutted weight, respectively. The commercial and recreational ACLs for red grouper are 221,577 lbs gutted weight and 276,740 lbs gutted weight, respectively. These values are equivalent to the expected catch resulting from the implementation of management measures for red grouper and black grouper in Snapper Grouper Amendment 16.

Alternative 2b (Preferred). Retain the commercial ACL for gag of 352,940 lbs gutted weight and the commercial AM to prohibit commercial harvest of shallow water groupers when the quota is projected to be met. Retain the current recreational ACL for gag of 340,060 lbs gutted weight.

In addition, establish an ACL for gag, black grouper, and red grouper of 662,403 lbs gutted weight (commercial) and 648,663 lbs gutted weight (recreational). [These values are equivalent to the expected catch resulting from the implementation of management measures for red grouper and black grouper in Snapper Grouper Amendment 16 and the gag quota specified in Snapper Grouper Amendment 16.]

Prohibit the commercial possession of shallow water groupers when the gag or the gag, black grouper, and red grouper when the ACL is projected to be met.

ACT Alternatives

Alternative 3. Establish an ACT for the recreational sector.

Alternative 3a. The recreational sector ACT equals 85% of the recreational sector ACL.

Alternative 3b. The recreational sector ACT equals 75% of the recreational sector ACL.

Alternative 3c. The recreational sector ACT equals sector ACL[(1-PSE) or 0.5, whichever is greater].

AM Alternatives

Alternative 4 (Preferred). For black grouper, black sea bass, gag, red grouper, and vermilion snapper, compare the recreational ACL with 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 5. Implement Accountability Measures (AMs) for the recreational sector for black grouper, black sea bass, gag, red grouper, and vermilion snapper.

Alternative 5a. Regardless of stock status, do not implement in-season AMs (a fishery closure) if the sector ACL is projected to be met. If the ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACL for the following fishing year.

Alternative 5b (Preferred). If at least one of the species *is overfished* and the sector ACL is projected to be met, prohibit the harvest and retention of the species or species group. If the ACL is exceeded, independent of stock status, the Regional Administrator shall publish a notice to reduce the sector ACL in the following year by the amount of the overage.

Alternative 5c. If a species *is overfished* and the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the ACT is exceeded, the Regional Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage.

*Note: It is the Council's intent that all recreational closures in the South Atlantic are associated with a possession limit of zero on board a vessel for which a valid federal South Atlantic Charter/Headboat Permit for Snapper-Grouper has been issued, regardless of where such species were harvested, i.e., in state or federal waters.
**Note: The overfished status is based on the most recent quarterly update of the status of the stocks report.

2.4.1 Comparison of Alternatives

Designating the current quotas and seasonal closures implemented through Snapper Grouper Amendments 13C, 15A, and 16 as ACLs and AMs would fulfill the ACL requirements of the Reauthorized Magnuson-Stevens Act for black sea bass, gag, and vermilion snapper. These measures would not incur additional negative socioeconomic impacts beyond the status quo since they have already been implemented. A broader discussion of the combined impacts of these recent snapper grouper amendments can be found in the cumulative effects section of this document, **Section 4.7**.

Alternative 2a would establish ACLs equivalent to commercial and recreational catch levels of black grouper and red grouper resulting from management measures under Snapper Grouper Amendment 16. Amendment 16 reduced the catch of black grouper and red grouper through a January-April commercial and recreational spawning season closure, a reduction in the recreational bag limit, and a closure of the commercial fishery for black grouper and red grouper when the gag quota is projected to be met. Therefore, the resultant catch levels of black grouper and red grouper, after these measures were implemented, would be designated as the respective ACLs. The AMs for the commercial sector would be a closure when the gag quota is projected to be met, as outlined in

Amendment 16. The recreational AM would apply to black grouper, black sea bass, gag, red grouper, and vermilion snapper. It would compare the recreational ACL with recreational landings over a range of years. For 2010, only 2010 landings would be used. For 2011, the average landings of 2010 and 2011 would be used, and for 2012 and beyond, the most recent three-year running average of the recreational landings would be used. If one or more of the species *is overfished* and the sector ACL is projected to be met, harvest and retention of species or species group would be prohibited. If the ACL is exceeded, the Regional Administrator would publish a notice to reduce the sector ACL in the following year by the amount of the overage.

Alternatives 1 (Status Quo) and **2** would both yield the same biological benefits; however, **Alternative 1 (Status Quo)** would not comply with Reauthorized Magnuson-Stevens Act ACL requirements for the recreational sector. Socioeconomic impacts of these alternatives are detailed in Snapper Grouper Amendment 16, which is hereby incorporated by reference. **Alternative 2b (Preferred)** would establish one single ACL for gag, black grouper, and red grouper, 662,403 pounds gutted weight (commercial) and 648,663 pounds gutted weight (recreational), which is based on catch levels expected under Amendment 16. Under **Alternative 2b (Preferred)** biological benefits would likely be similar to those under **Alternative 2a.**

Alternative 3 would establish ACTs for the recreational sector. Each of the sub-alternatives differ in their degree of conservativeness. **Alternative 3a** is the least conservative of the action alternatives and would set the recreational sector ACT for gag, black grouper, red grouper, black sea bass, and vermilion snapper equal to 85% of the ACL. A greater biological benefit would be attained through **Alternative 3b**, which would set the ACT to 75% of ACL. **Alternative 3c** attempts to capture the difference in uncertainty associated with black sea bass, gag, black grouper, red grouper, and vermilion snapper by incorporating the percent standard error (PSE) in the estimate of ACT. Therefore, the ACT for species such as vermilion snapper and black sea bass would be higher than the ACT for species such as black grouper with higher estimates of PSE, which are less frequently encountered.

Alternative 4 (Preferred) would use a range of landings to determine overages of ACLs. In the first year (2010), only 2010 recreational landings would be used. In the second year (2011), the average landings of 2010 and 2011 would be used to determine if an overage had occurred. For 2012 and beyond, the most recent three-year running average would be employed to determine if there was an overage of the ACL. Recreational landings data can be highly variable, particularly for species that are infrequently encountered. Therefore, using average landings for comparison with the ACL can buffer peaks in the recreational landings that may be a function of sampling rather than a true estimation of actual harvest.

Alternatives 5a, **5b (preferred),** and **5c** are similar in that they each establish a mechanism by which the Regional Administrator can compensate for exceeding the ACL by reducing harvest during the following year. Under **Alternative 5a**, if the ACL was exceeded, the Regional Administrator would reduce the length of the following fishing

year by the amount necessary to ensure landings did not exceed the sector ACT for the following fishing year. Under **Alternative 5b (Preferred)**, if a species is overfished and the sector ACL is projected to be met, harvest and retention of species or species group would be prohibited. If the ACL is exceeded, the Regional Administrator shall publish a notice to reduce the sector ACL in the following year by the amount of the overage, regardless of stock status. Under **Alternative 5c**, exceeding the ACT for an overfished species, rather than the ACL, would trigger the need for the Regional Administrator to publish a notice to reduce the ACT the following year by the amount of the overage.

Alternative 1 (Status Quo) is not a viable long-term alternative because it would not fully satisfy the requirements of the Reauthorized Magnuson-Stevens Act. Its selection would require additional subsequent management action, with duplicative administrative costs. Not all of the remaining alternatives under this action deal with the same management component and, therefore, are not directly comparable. Instead, only sub-sets of alternatives are comparable. **Alternative 2a** would allow current harvests, not be expected to require any additional management measures, and not be expected to result in any adverse social effects. **Alternative 2b (Preferred)** would establish an aggregate ACL for gag, red grouper, and black grouper in addition to single species ACLs and an AM based on single species or aggregate species harvest thresholds. As a result of this aggregate approach, social benefits may increase or decrease, depending on resultant fishery performance and behavior, as gag harvests could result in closure of the fisheries for all three species (diminished social benefits), or increased harvest of the other species could substitute for decreased gag harvests (increased social benefits). The gag resource, and associated social and economic benefits, however, would be expected to be better safeguarded by **Alternative 2b (Preferred)** than under **Alternative 2a**.

Alternative 3 would only establish ACT benchmarks, with no associated necessary management change, and would not be expected to result in any change in social benefits. Because the multi-year perspective of **Alternative 4 (Preferred)** would be capable of addressing the potential variability of recreational harvest estimates, it would be expected to result in increased social benefits relative to single-year assessment and management action. Both **Alternative 5a** and **Alternative 5b (Preferred)** contain sufficient uncertainty of net social effects that ranking is not possible. **Alternative 5b (Preferred)** would base management action on projected harvests rather than actual (final data) and, as a result, may result in unnecessary corrective action, with associated unjustified adverse social effects. Both alternatives would delay corrective action until the subsequent fishing year, which should allow greater flexibility for fishermen and associated businesses to plan activities, resulting in greater social and economic benefits than same-year correction. **Alternative 5c** would be expected to result in social effects similar to **Alternative 5b (Preferred)**. However, because the ACT for a stock will generally be less than the ACL for that stock, using the ACT as the AM-trigger threshold under **Alternative 5c** increases protection of the resource while also increasing the likelihood of reduced social and economic benefits relative to **Alternative 5b (Preferred)** if stock and/or fishery conditions do not warrant the additional stock protection the more conservative ACT limit affords.

2.5 Update the framework procedure for specification of TAC for the Snapper Grouper FMP to incorporate ACLs and ACTs and AMs.

Update the framework procedure for specification of TAC

The Snapper Grouper FMP's framework procedure for setting TAC provides a mechanism for making changes to allowable catch levels and related management of stocks or stock complexes in a timely manner when stock assessments or new assessment information indicates that changes are needed. Changes that can be made through a Regulatory Amendment (also known as a Framework Action) include biomass levels, age-structured analyses, target dates for rebuilding overfished species, MSY, ABC, TAC quotas, trip limits, bag limits, minimum sizes, gear restrictions, seasonal or area closures, definitions of essential fish habitat, EFH, EFH-HAPCs or Coral HAPCs, and restrictions on gear and fishing activities applicable in EFH and EFH-HAPCs. Under the Reauthorized Magnuson-Stevens Act and the amended guidelines for National Standard 1 (74 FR 3178), it is also necessary to be able to adjust ACLs and ACTs. This action revises the current Snapper Grouper FMPs Framework Procedure to allow such adjustments under the framework.

The Council is proposing establishment of ACLs and ACTs where needed. Currently, the framework procedure (below) specifies that if changes are needed to the TAC, the Council will advise the Regional Administrator in writing of their recommendations accompanied by the Council-appointed Assessment Group's report (where appropriate), relevant background material, draft regulations, Regulatory Impact Review, and public comments. The Council is updating the procedures for specification of TAC in order to incorporate the ACL and ACT vernacular. With this revision, specification of the TAC section of the framework procedure would be renamed to reflect the 2009 National Standard 1 Guidelines, which define ACL as the primary method to control harvest levels. As used in the framework procedure, ACL an analogous to the term TAC, and to eliminate redundancy, TAC is no longer used.

Alternative 1 (Status Quo). Do not include the ability to modify ACLs, ACTs, and AMs in the existing framework procedure.

Current Framework procedure:

I. Establish an assessment group and annual adjustments:

1. The Council will appoint an assessment group (Group) that will assess the condition of selected snapper grouper species in the management unit (including periodic economic and sociological assessments as needed) on an annually planned basis. The Group will present a report of its assessment and recommendations to the Council.

2. The Council will consider the report and recommendations of the Group and hold public hearings at a time and place of the Council's choosing to discuss the Group's report. The Council may convene the Advisory Panel and the Scientific and Statistical Committee to provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

3. If changes are needed in the maximum sustainable yield (MSY), total allowable catch (TAC), quotas, trip limits, bag limits, minimum sizes, gear restrictions, season/area closures (including spawning closures), timeframe for recovery of overfished species or fishing year, the Council will advise the Regional Director in writing of their recommendations accompanied by the Group's report (where appropriate), relevant background material, draft regulations, Regulatory Impact Review and public comments. For wreckfish and any other species under limited access, this report will be submitted each year at least 60 days prior to the start of the fishing season (currently April 16). Biomass levels and age structured analyses are to be added as they become available.

4. The Regional Director will review the Council's recommendations, supporting rationale, public comments and other relevant information. If the Regional Director concurs that the Council's recommendations are consistent with the goals and objectives of the fishery management plan, the national standards and other applicable law, the Regional Director will recommend that the Secretary publish proposed and final rules in the Federal Register of any changes for species managed under limited access prior to the fishing year, and for all other species and/or changes on such dates as may be agreed upon with the Council.

5. Should the Regional Director reject the recommendations, he will provide written reasons to the Council for the rejection, and existing regulations will remain in effect until the issue is resolved.

6. Appropriate adjustments that may be implemented by the Secretary by proposed and final rules in the Federal Register are:

a. Initial specification of MSY and subsequent adjustment of the best estimate of MSY where this information is available for a particular species.

b. Initial specification of acceptable biological catch (ABC) and subsequent adjustment of the ABC range and/or best estimate when and where this information is available for a particular species.

c. Setting TAC for a particular species. A TAC for wreckfish may not exceed 8 million pounds.

d. Modifying (or implementing for a particular species) TAC, quotas (including zero quotas), trip limits, bag limits (including zero bag limits), minimum sizes, gear restrictions (ranging from modifying current regulations to a complete prohibition) and season/area closures (including spawning closures).

e. The fishing year and spawning closure for wreckfish may not be adjusted by more than one month.

f. Authority is granted to the Regional Director to close any fishery, i.e. revert any bag limit to zero and close any commercial fishery, once a quota has been established through the procedure described above and such quota has been filled. When such action is necessary, the Regional Director will recommend that the Secretary publish a notice in the Federal Register as soon as possible.

g. Modifying (or implementing for a particular species) a timeframe for recovery of an overfished species.

h. Initial specification and subsequent adjustment of biomass levels and age structured analyses.

Alternative 2. (Preferred) Update the framework procedure for specification of Total Allowable Catch (TAC) for the Snapper Grouper FMP to incorporate ACLs, ACTs, and AMs. Such modifications would be based upon new scientific information indicating such modifications are prudent.

Table 2-7. Proposed framework modifications.

Items retained from current framework	**Items removed from current framework**	**Items added to current framework**
Adjustments to or establishment of MSY	Provision that would not allow fishing year or spawning season closure to be adjusted by more than one month for wreckfish.	Use of SEDAR reports or other documentation the Council deems appropriate to provide biological analyses
Adjustments to ABC	References to the Council-appointed "assessment group"	The SSC prepares a written report to the Council specifying OFL and a range of ABCs for species in need of catch reductions to achieve OY.
Adjustments to or implementation of quotas including closing any commercial fishery when the quota is filled	References to the assessment group report.	The SEDAR report or SSC will recommend rebuilding periods
Adjustments to TAC		
Adjustments to or implementation of trip limits		Adjustment to ACLs and/or sector ACLs
Adjustments to or implementation of bag limits including zero bag limits		Adjustment to or implementation of ACTs
Adjustments to or implementation of minimum sizes		Adjustments to or implementation of AMs
Adjustments to or implementation of gear restrictions		Adjustments to fishing seasons/years
Adjustments to or implementation of seasonal/area closures		
Adjustment to or implementation of timeframes for recovery of an overfished species.		
Initial specification and subsequent adjustments of biomass levels and age structured analysis.		
Inclusion of public input in the framework adjustment process		
SSC's role in providing the Council advise and recommendations for framework adjustments		

Proposed Language for Updated Framework Procedure

I. Snapper Grouper FMP Framework Procedure for Specification of Annual Catch Limits, Annual Catch Targets, Overfishing Limits, Acceptable Biological Catch, and annual adjustments:

Procedure for Specifications:

1. At times determined by the SEDAR Steering Committee, and in consultation with the Council and NMFS Southeast Regional Office (SERO), stock assessments or assessment updates will be conducted under the SEDAR process for stocks or stock complexes managed under the Snapper Grouper FMP. Each SEDAR stock assessment or assessment update will: a) assess to the extent possible the current biomass, biomass proxy, or SPR levels for each stock; b) estimate fishing mortality (F) in relation to F_{MSY} (MFMT) and F_{OY}; c) determine the overfishing limit (OFL); d) estimate other population parameters deemed appropriate; e) summarize statistics on the fishery for each stock or stock complex; f) specify the geographical variations in stock abundance, mortality recruitment, and age of entry into the fishery for each stock or stock complex; and g) develop estimates of B_{MSY}.

2. The Council will consider SEDAR stock assessments or other documentation the Council deems appropriate to provide the biological analysis and data listed above in paragraph 1. Either the SEFSC or the stock assessment branch of a state agency may serve as the lead in conducting the analysis, as determined by the SEDAR Steering Committee. The Scientific and Statistical Committee (SSC) will prepare a written report to the Council specifying an OFL and may recommend a range of ABCs for each stock complex that is in need of catch reductions for attaining or maintaining OY. The OFL is the annual harvest level corresponding to fishing at MFMT (F_{MSY}). The ABC range is intended to provide guidance to the SSC and is the OFL as reduced due to scientific uncertainty in order to reduce the probability that overfishing will occur in a year. To the extent practicable, the probability that overfishing will occur at various levels of ABC and the annual transitional yields (i.e., catch streams) calculated for each level of fishing mortality within the ABC range should be included with the recommended range.

For overfished stocks, the recommended range of ABCs shall be calculated so as to end overfishing and achieve snapper grouper population levels at or above B_{MSY} within the rebuilding periods specified by the Council and approved by NOAA Fisheries Service. The SEDAR report or SSC will recommend rebuilding periods based on the provisions of the National Standard Guidelines, including generation times for the affected stocks. Generation times are to be specified by the stock assessment panel based on the biological characteristics of the individual stocks. The report will recommend to the Council a B_{MSY} level and a MSST from B_{MSY}. The report may also recommend more appropriate estimates

of F_{MSY} for any stock. The report may also recommend more appropriate levels for the MSY proxy, OY, the overfishing threshold (MFMT), and overfished threshold (MSST). For stock or stock complexes where data are inadequate to compute an OFL and recommended ABC range, the SSC will use other available information as a guide in providing their best estimate of an OFL corresponding to MFMT and ABC range that should result in not exceeding the MFMT.

3. The SSC will examine SEDAR reports or other new information, the OFL determination, and the recommended range of ABC. In addition, the SSC will examine information provided by the social scientists and economists from the Council staff and from the SERO Fisheries Social Science Branch analyzing social and economic impacts of any specification demanding adjustments of allocations, ACLs, ACTs, AMs, quotas, bag limits, or other fishing restrictions. The SSC will use the ABC control rule to set their ABC recommendation at or below the OFL, taking in account scientific uncertainty. If the SSC sets their ABC recommendations equal to OFL, the SSC will provide its rational why it believes that level of fishing will not exceed MFMT.

4. The Council may conduct a public hearing on the reports and the SSC's ABC recommendation at, or prior, to the time it is considered by the Council for action. Other public hearings may be held also. The Council may request a review of the report by its Snapper Grouper Advisory Panel and optionally by its socioeconomic experts and convene these groups before taking action.

5. The Council, in selecting an ACL, ACT, AM, and a stock restoration time period, if necessary, for each stock or stock complex for which an ABC has been identified, will, in addition to taking into consideration the recommendations and information provided for in paragraphs 1, 2, 3, and 4, utilize the following criteria:

> **a.** Set ACL at or below the ABC specified by the SSC or set a series of annual ACLs at or below the projected ABCs in order to account for management uncertainty. If the Council sets ACL equal to ABC, and ABC has been set equal to OFL, the Council will provide its rationale as to why it by it believes that level of fishing will not exceed MFMT.
>
> **b.** May subdivide the ACLs into commercial, for-hire, and private recreational sector ACLs that maximize the net benefits of the fishery to the nation. The Sector ACLs will be based on allocations determined by criteria established by the Council and specified by the Council through a plan amendment. If, for an overfished stock, harvest in any year exceeds the ACL or sector ACL, management measure and catch levels for that sector will be adjusted in accordance with the AMs established for that stock.

c. Set ACTs or sector ACTs at or below ACLs and in accordance with the provision of the AM for that stock. The ACT is the management target that accounts for management uncertainty in controlling the actual catch at or below the ACL. If an ACL is exceeded repeatedly, the Council has the option to establish an ACT if one does not already exist for a particular stock and adjust or establish AMs for that stock as well.

6. The Council will provide the SSC specification of OFL; SSC recommendation of ABC; and its recommendations to the NOAA Fisheries Service Regional Administrator for ACLs, sector ACLs, ACTs, sector ACTs, AMs, sector AMs, and stock restoration target dates for each stock or stock complex, estimates of B_{MSY} and MSST, estimates of MFMT, and the quotas, bag limits, trip limits, size limits, closed seasons, and gear restrictions necessary to avoid exceeding the ACL or sector ACLS, along with the reports, a regulatory impact review and proper National Environmental Policy Act (NEPA) documentation, and the proposed regulations within a predetermined time as agreed upon by the Council and Regional Administrator. The Council may also recommend new levels or statements for MSY (or proxy) and OY.

7. The Regional Administrator will review the Council's recommendations and supporting information, and, if he concurs that the recommendations are consistent with the objectives of the FMP, the National Standards, and other applicable law, he shall forward for publication notice of proposed rules to the Assistant Administrator (providing appropriate time for additional public comment). The Regional Administrator will take into consideration all public comment and information received and will forward for publication in the *Federal Register* of a final rule within 30 days of the close of the public comment, or such other time as agreed upon by the Council and Regional Administrator.

8. Appropriate regulatory changes that may be implemented by final rule in the *Federal Register* include:

a. ACLs or sector ACLs, or a series of annual ACLs or sector ACLs.

b. ACTs or sector ACTs, or a series of annual ACTs or sector ACTs and establish ACTs for stocks which do not have an ACT.

c. AMs or sector AMs.

d. Bag limits, size limits, vessel trip limits, closed seasons or area, gear restrictions, and quotas designed to achieve OY and keep harvest levels from exceeding the ACL or sector ACL.

e. The time period specified for rebuilding an overfished stock, estimated MSY and MSST for overfished stocks, and MFMT.

f. New levels or statements of MSY (or proxy) and OY for any stock.

g. New levels of total allowable catch (TAC).

h. Adjust fishing seasons/years.

9. The NMFS Regional Administrator is authorized, through notice action, to conduct the following activities.

a. Close the commercial fishery of a snapper grouper species or species group that has a commercial quota or sub-quota at such time as projected to be necessary to prevent the commercial sector form exceeding its sector ACL or ACT for the remainder of the fishing year or sub-quota season.

b. Close the recreational fishery of a snapper grouper species or species group at such time as projected to be necessary to prevent recreational sector ACLs or ACTs from being exceeded.

c. Reopen a commercial or recreational season that had been prematurely closed if needed to assure that a sector ACL or ACT can be reached.

10. If NMFS decides not to publish the proposed rule for the recommended management measures, or to otherwise hold the measures in abeyance, then the Regional Administrator must notify the Council of its intended action and the reasons for NMFS concern along with suggested changes to the proposed management measures that would alleviate the concerns. Such notice shall specify: 1) The applicable law with which the amendment is inconsistent; 2) the nature of such inconsistencies; and 3) recommendation concerning the action that could be taken by the Council to conform the amendment to the requirements of applicable law.

* Note: The EFH portion of the current framework procedure would remain unchanged under this action.

II. Establish a procedure to allow for rapid modification to definitions of Essential Fish Habitat (EFH); establishment of new, or modification of existing, Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs); and establishment of new, or modification of existing, Coral-Habitat Areas of Particular Concern.

This adjustment procedure will allow the Council to add or modify measures through a streamlined public review process. As such, measures that have been identified could be implemented or adjusted at any time during the year. The process is as follows:

1. The Council will call upon the Habitat and Environmental Protection Advisory Panel (Panel) for EFH-related actions and the Coral Advisory Panel for Coral-HAPC related actions. The Habitat and/or Coral Advisory Panel(s) will present a report of their assessment and recommendations to the Council.

2. The Council may take framework action one or more times during a year based on need. Such action(s) may come from the Panel report or the Council may take action based on issues/problems/information that surface separate from the Panel. The steps are as follows:

A. Habitat or Coral Advisory Panel Report - The Council will consider the report and recommendations of the Panel and hold public hearings at a time and place of the Council's choosing to discuss the Panel's report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the Panel's report and provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

B. Information separate from Panel Report - The Council will consider information that surfaces separate from the Panel. Council staff will compile the information and analyze the impacts of likely alternatives to address the particular situation. The Council staff report will be presented to the Council. A public hearing will be held at the time and place where the Council considers the Council staff report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the staff report and provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

3. If the Council determines that an addition or adjustment (e.g., in a species or species complex definition of EFH or EFH-HAPCs or a new EFH-HAPC is proposed for a species or species complex) to EFH, EFH-HAPCs, or Coral-HAPCs is necessary to meet the goals and objectives of the Habitat Plan, it will recommend, develop, and analyze appropriate action over the span of at least two Council meetings. The Council will provide the public with:

A. Advance notice of the availability of the recommendation.

B. The appropriate justifications, and biological, economic, and social analyses.

C. An opportunity to comment on the proposed adjustments prior to and at the second Council meeting.

4. After developing management actions and receiving public testimony, the Council will then submit the recommendation to the Regional Administrator. The Council's recommendation to the Regional Administrator must include supporting

rationale, an analysis of impacts, and a recommendation to the Regional Administrator on whether to publish the management measure(s) as a final rule.

5. If the Council recommends that the management measures should be published as a final rule, the Council must consider at least the following factors and provide support and analysis for each factor considered:

A. Whether the availability of data on which the recommended management measures are based allows for adequate time to publish a proposed rule.

B. Whether regulations have to be in place for an entire harvest/fishing season.

C. Whether there has been adequate notice and opportunity for participation by the public and members of the affected industry in the development of the Council's recommended management measures.

D. Whether there is an immediate need to protect the resource.

E. Whether there will be a continuing evaluation of management measures adopted following their promulgation as a final rule.

6. If, after reviewing the Council's recommendation and supporting information based on the FMP and the administrative record:

A. The Regional Administrator concurs with the Council's recommended management measures and determines that the recommended management measures may be published as a final rule then the action will be published in the Federal Register as a final rule; or

B. The Regional Administrator concurs with the Council's recommendation and determines that the recommended measures should be published first as a proposed rule, the action will be published as a proposed rule in the Federal Register. After additional public comment, if the Regional Administrator concurs with the Council recommendation, the action will be published as a final rule in the Federal Register; or

C. The Regional Administrator does not concur, the Council will be notified, in writing, of the reason for non-concurrence and recommendations to address those concerns.

7. Appropriate adjustments that may be implemented by the Secretary by proposed and final rules in the Federal Register are:

A. Definition of or modification of a current definition of Essential Fish Habitat for a managed species or species complex.

B. Establishment of or modification of EFH-HAPCs for managed species or species complex.

C. Establishment of or modifications of Coral-HAPCs.

D. Description, identification, and regulations of fishing activities to protect EFH and EFH-HAPCs.

E. Management measures to reduce or eliminate the adverse effects of fishing activities or fishing gear on EFH or EFH-HAPCs.

F. Regulations of EFH-HAPCs.

2.5.1 Comparison of Alternatives

Alternative 1 (Status Quo) would not modify the current framework procedures to include adjustments to ACLs, ACTs, and AMs. This would maintain the Regional Administrator's current ability to adjust TAC, quotas, trip limits, bag limits, size limits, seasonal closures, and area closures; however, there would exist no means of making needed adjustments to the ACLs, ACT, and AMs in a timely manner. Under **Alternative 2 (Preferred),** adjustments to ACLs, ACTs, and AMs could be made with relative ease as new fishery and stock abundance information becomes available. **Alternative 2 (Preferred)** would likely be biologically beneficial for any species to which an ACL, ACT, and/or AM is assigned. By changing the current framework procedures to allow for periodic adjustments to these parameters, management measures could be altered in a timely manner to implement harvest level changes or AMs in response to stock assessment or survey results.

Alternative 1 (Status Quo) would not modify the framework procedure for setting TAC and would not support more efficient and effective management of the fishery. **Alternative 2 (Preferred)** would increase the types of management measures that could be modified under the framework. This would be expected to increase the efficiency and effectiveness of management change, potentially allowing less severe corrective action when necessary, or the quicker receipt of social and economic benefits associated with less restrictive management. In the long term, positive social and economic effects, relative to the status quo, would be expected from more timely management adjustments.

3 Affected Environment

3.1 Habitat

3.1.1 Inshore/Estuarine Habitat

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 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 diurnal feeding migrations or seasonal shifts in cross-shelf distributions. More detail on these habitat types is found in **Sections 3.2.1** and **3.2.2** of the Council's Habitat Plan (SAFMC 1998e).

3.1.2 Offshore Habitat

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

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

Rock outcroppings occur throughout the continental shelf from Cape Hatteras, North Carolina to Key West, Florida (MacIntyre and Milliman 1970; Miller and Richards 1979; Parker *et al*. 1983), which are principally composed of limestone and carbonate sandstone

(Newton *et al*. 1971), and exhibit vertical relief ranging from less than 0.5 to over 10 meters (33 feet). Ledge systems formed by rock outcrops and piles of irregularly sized boulders are also common. Parker *et al*. (1983) estimated that 24% (9,443 km^2) of the area between the 27 and 101 meters (89 and 331 feet) isobaths from Cape Hatteras, NC to Cape Canaveral, FL is reef habitat. Although the benthic communities found in water depths between 100 and 300 meters (328 and 984 feet) from Cape Hatteras, NC to Key West, FL is relatively small compared to the whole shelf, this area, based upon landing information of fishers, constitutes prime reef fish habitat and probably significantly contributes to the total amount of reef habitat in this region.

Man-made artificial reef structures are also utilized to attract fish and increase fish harvests; however, research on man-made reefs is limited and opinions differ as to whether or not these structures promote an increase of ecological biomass or merely concentrate fishes by attracting them from nearby, natural unvegetated areas of little or no relief.

The distribution of coral and live hard-bottom habitat as presented in the SEAMAP Bottom Mapping Project is a proxy for the distribution of the species within the snapper grouper complex. The method used to determine hard bottom habitat relied on the identification of reef obligate species including members of the snapper grouper complex. The Florida Fish and Wildlife Research Institute (FWRI), using the best available information on the distribution of hard bottom habitat in the south Atlantic region, prepared ArcView maps for the four-state project. These maps, which consolidate known distribution of coral, hard/live bottom, and artificial reefs as hard bottom, are included in Appendix E of the Habitat Plan (SAFMC 1998e). These maps are also available on the Internet at the Council's following Internet Mapping System website: http://ocean.floridamarine.org/efh_coral/ims/viewer.htm.

The South Carolina Department of Natural Resources, NOAA/Biogeographic Characterization Branch, and the South Atlantic Fishery Management Council cooperatively generated additional information on managed species' use of offshore fish habitat. Plots of the spatial distribution of offshore species were generated from the Marine Resources Monitoring, Assessment, and Prediction Program (MARMAP) data (Figures 35-41) in the Habitat Plan (SAFMC 1998e). The plots should be considered as point confirmation of the presence of each species within the scope of the sampling program. These plots, in combination with the hard bottom habitat distributions presented in Appendix E of the Habitat Plan (SAFMC 1998e), can be employed as proxies for offshore snapper grouper complex distributions in the south Atlantic region. Maps of the distribution of snapper grouper species by gear type based on MARMAP data can be generated through the Council's Internet Mapping System at the following web address: http://ocean.floridamarine.org/efh_coral/ims/viewer.htm.

3.1.3 Essential Fish Habitat

Essential fish habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S. C. 1802(10)). Specific categories of EFH identified in the South Atlantic Bight, which are utilized by federally managed fish and invertebrate species, include both estuarine/inshore and marine/offshore areas. Specifically, estuarine/inshore EFH includes: Estuarine emergent and mangrove wetlands, submerged aquatic vegetation, oyster reefs and shell banks, intertidal flats, palustrine emergent and forested systems, aquatic beds, and estuarine water column. Additionally, marine/offshore EFH includes: Live/hard bottom habitats, coral and coral reefs, artificial and manmade reefs, *Sargassum* species, and marine water column.

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

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

3.1.4 Habitat Areas of Particular Concern

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

particular concern include habitats required during each life stage (including egg, larval, postlarval, juvenile, and adult stages).

In addition to protecting habitat from fishing related degradation though FMP regulations, the Council, in cooperation with NOAA Fisheries, actively comments on non-fishing projects or policies that may impact essential fish habitat. The Council adopted a habitat policy and procedure document that established a four-state Habitat Advisory Panel and adopted a comment and policy development process. With guidance from the Advisory Panel, the Council has developed and approved habitat policies on: Energy exploration, development, transportation and hydropower re-licensing; beach dredging and filling and large-scale coastal engineering; protection and enhancement of submerged aquatic vegetation; and alterations to riverine, estuarine and nearshore flows (Appendix C of Habitat Plan; SAFMC 1998e).

3.2 Biological/Ecological Environment

3.2.1 Species Most Impacted By This FMP Amendment

3.2.1.1 Gag, *Mycteroperca microlepis*

Gag occur in the Western Atlantic from North Carolina to the Yucatan Peninsula, and throughout the Gulf of Mexico. Juveniles are sometimes observed as far north as Massachusetts (Heemstra and Randall 1993). Gag commonly occur at depths of 39-152 m (131-498 ft) (Heemstra and Randall 1993) and prefer inshore-reef and shelf-break habitats (Hood and Schlieder 1992). Bullock and Smith (1991) indicated gag probably do not move seasonally between reefs in the Gulf of Mexico, but show a gradual shift toward deeper water with age. McGovern *et al.* (2005) reported extensive movement of gag along the Southeast United States. In a tagging study, 23% of the 435 recaptured gag moved distances greater that 185 km (100 nautical miles). Most of these individuals were tagged off South Carolina and were recaptured off Georgia, Florida, and in the Gulf of Mexico (McGovern *et al.* 2005).

Gag are probably estuarine dependent (Keener *et al.* 1988; Ross and Moser 1995; Koenig and Coleman 1998; Strelcheck *et al.* 2003). Juveniles (age 0) occur in shallow grass beds along Florida's east coast during the late spring and summer (Bullock and Smith 1991). Sea grass is also an important nursery habitat for juvenile gag in North Carolina (Ross and Moser 1995). Post-larval gag enter South Carolina estuaries when they are 13 mm (0.5 inches) TL and 40 days old during April and May each year (Keener *et al.* 1988), and utilize oyster shell rubble as nursery habitat. Juveniles remain in estuarine waters throughout the summer and move offshore as water temperatures cool during September and October. Adults are often seen in shallow water 5-15 m (16-49 ft) above the reef (Bullock and Smith 1991) and as far as 40-70 km (22-38 nautical miles) offshore.

Huntsman *et al.* (1999) indicated gag are vulnerable to overfishing since they are long-lived, late to mature, change sex, and aggregate to spawn. The estimated natural mortality rate is 0.14 (SEDAR 10 2007). Maximum reported size for gag is 145 cm (57.5 inches) TL and 36.5 kg (81 pounds) (Heemstra and Randall 1993), and maximum

reported age is 26 years (Harris and Collins 2000). Gag is a sequential hermaphrodite, changing sex from female to male with increased size and age (Coleman *et al.* 1996; McGovern *et al.* 1998; Coleman *et al.* 2000). All individuals less than 87.5 cm (34.7 inches) TL are females. At 105.0 cm (41.6 inches) TL, 50% of fishes are males. Almost all gag are males at sizes greater than 120.0 cm (47.5 inches) TL (McGovern *et al.* 1998).

Along the southeastern United States (1994-1995), size at first maturity is 50.8 cm (20.2 inches) TL, and 50% of gag females are sexually mature at 62.2 cm (24.7 inches) (McGovern *et al.* 1998). According to Harris and Collins (2000), age-at-first-maturity is 2 years, and 50% of gag are mature at 3 years. For data collected during 1978-1982 off the southeastern United States, McGovern *et al.* (1998) reported the smallest mature females were 58.0 cm (22.9 inches) TL and 3 years old. Hood and Schlieder (1992) indicated most females reach sexual maturity at ages 5-7 in the Gulf of Mexico. Off the southeastern United States, gag spawn from December through May, with a peak in March and April (McGovern *et al.* 1998). Duration of planktonic larvae is about 42 days (Keener *et al.* 1988; Koenig and Coleman 1998; Lindeman *et al.* 2000). McGovern *et al.* (1998) reported the percentage of male gag landed by commercial fishermen decreased from 20% during 1979-1981 to 6% during 1995-1996. This coincided with a decrease in the mean length of fish landed. A similar decrease in the percentage of males was reported in the Gulf of Mexico (Hood and Schleider 1992; Coleman *et al.* 1996).

Adults are sometimes solitary, and can occur in groups of 5 to 50 individuals. They feed primarily on fishes, crabs, shrimp, and cephalopods (Heemstra and Randall 1993), and often forage in small groups far from the reef ledge (Bullock and Smith 1991). Juveniles feed primarily on crustaceans, and begin to consume fishes when they reach about 25 mm (1 inch) in length (Bullock and Smith 1991; Mullaney 1994).

3.2.1.2 Red grouper, *Epinephelus morio*

Red grouper is primarily a continental species, mostly found in broad shelf areas (Jory and Iversen 1989). Red grouper occur in the Western Atlantic, from North Carolina to southeastern Brazil, including the eastern Gulf of Mexico and Bermuda, but can occasionally be found as far north as Massachusetts (Heemstra and Randall 1993). Red grouper is uncommon around coral reefs; it generally occurs over flat rock perforated with solution holes (Bullock and Smith 1991), and is commonly found in the caverns and crevices of limestone reef in the Gulf of Mexico (Moe 1969). It also occurs over rocky reef bottoms (Moe 1969).

Adult red grouper are sedentary fish that are usually found at depths of 5-300 m (16-984 ft). Fishermen off North Carolina commonly catch red grouper at depths of 27-76 m (88-249 ft) for an average of 34 m (111 ft). Fishermen off southeastern Florida also catch red grouper in depths ranging from 27-76 m (88-249 ft) with an average depth of 45 m (148 ft) (Burgos 2001; McGovern *et al.* 2002). Moe (1969) reported that juveniles live in shallow water nearshore reefs until they are 40.0 cm (16 inches) and 5 years of age, when they become sexually mature and move offshore. Spawning occurs during February-June, with a peak in April (Burgos 2001). In the eastern Gulf of Mexico, ripe females are

found December through June, with a peak during April and May (Moe 1969). Based on the presence of ripe adults (Moe 1996) and larval red grouper (Johnson and Keener 1984) spawning probably occurs offshore. Coleman *et al*. (1996) found groups of spawning red grouper at depths between 21-110 m (70-360 feet). Red grouper do not appear to form spawning aggregations or spawn at specific sites (Coleman *et al.* 1996). They are reported to spawn in depths of 30-90 m (98-295 ft) off the Southeast Atlantic coast (Burgos 2001; McGovern *et al.* 2002).

Red grouper are protogynous, changing sex from female to male with increased size and age. Off North Carolina, red grouper first become males at 50.9 cm (20.1 inches) TL and males dominate size classes greater than 70.0 cm (27.8 inches) TL. Most females transform to males between ages 7 and 14. Burgos (2001) reported that 50% of the females caught off North Carolina are undergoing sexual transition at age 8. Maximum age reported by Heemstra and Randall (1993) was 25 years. Burgos (2001) and McGovern *et al.* (2002) indicated red grouper live for at least 20 years in the Southeast Atlantic and a maximum age of 26 years has been reported for red grouper in the Gulf of Mexico (L. Lombardi, NMFS Panama City, personal communication). Natural mortality rate is estimated to be 0.20 (Potts and Brennan 2001). Maximum reported size is 125.0 cm (49.2 inches) TL (male) and 23.0 kg (51.1 pounds). For fish collected off North Carolina during the late 1990s, age at 50% maturity of females is 2.4 years and size at 50% maturity is 48.7 cm (19.3 inches) TL. Off southeastern Florida, age at 50% maturity was 2.1 years and size at 50% maturity was 52.9 cm (21.0 inches) TL (Burgos 2001; McGovern *et al.* 2002). These fish eat a wide variety of fishes, octopi, and crustaceans, including shrimp, lobsters, and stomatopods (Bullock and Smith 1991, Heemstra and Randall 1993).

3.2.1.3 Black grouper, *Mycteroperca bonaci*

The black grouper occurs in the Western Atlantic, from North Carolina to Florida, Bermuda, the Gulf of Mexico, West Indies, and from Central America to Southern Brazil (Crabtree and Bullock 1998). Adults are found over hard bottom such as coral reefs and rocky ledges. Black grouper occur at depths of 9 to 30 m (30 to 98 ft). Juveniles sometimes occur in estuarine seagrass and oyster rubble habitat in North Carolina and South Carolina (Keener *et al.* 1988; Ross and Moser 1995). In the Florida Keys, juveniles settle on patch reefs (Sluka *et al.* 1994). Commercial landings of black grouper exceed landings of any other grouper in the Florida Keys.

Natural mortality (M) is estimated to be 0.15 (Potts and Brennan 2001). Crabtree and Bullock (1998) found black grouper live for at least 33 years and attain sizes as great as 151.8 cm (60.1 inches) TL. Females range in length from 15.5 to 131.0 cm (6.1-51.9 inches) TL and males range in length from 94.7 to 151.8 cm (38.3-60.1 in) TL. Black grouper are protogynous. Approximately 50% of females are sexually mature by 82.6 cm (32.7 inches) TL and 5.2 years of age. At a length of 121.4 cm (48.1 inches) TL and an age of 15.5 years, approximately 50% of the females have become males. Black grouper probably spawn throughout the year, however, peak spawning of females occurs from January to March.

Off Belize, black grouper are believed to spawn in aggregations at the same sites used by Nassau grouper (Carter and Perrine 1994). Eklund *et al.* (2000) describe a black grouper spawning aggregation discovered during winter 1997-1998, less than 100 m outside a newly designated marine reserve. Adults feed primarily on fishes.

3.2.1.4 Speckled hind, *Epinephelus drummondhayi*

Speckled hind occur in the Western Atlantic Ocean from North Carolina and Bermuda to the Florida Keys, and in the northern and eastern Gulf of Mexico (Heemstra and Randall 1993, in Froese and Pauly 2003). The speckled hind is solitary and found in depths from 25 m (98 ft) (Heemstra and Randall 1993) to 400 m (1,312 ft) (Bullock and Smith 1991). Heemstra and Randall (1993) reported that it most commonly occurs at depths of 60-120 m (197-394 ft). Bullock and Smith (1991) indicated that most commercial catches are taken from depths of 50 m (164 ft) or more. Juveniles occur in shallower waters.

Maximum reported size is 110 cm (43.3 in) TL and 30 kg (66 lbs) Heemstra and Randall 1993, in Froese and Pauly 2003). The maximum size and age of individuals examined by Matheson and Huntsman (1984) in the South Atlantic Bight was 110 cm (43.3 in) and 15 years, respectively. Heemstra and Randall (1993) reported a maximum age of 25 years. Estimated size at maturity is 81.1 cm (32 in), and M is estimated at from 0.14 (Froese and Pauly 2003) to 0.15 (Potts *et al.* 1998a).

The speckled hind is thought to form spawning aggregations (G. Gilmore, Dynamac Corporation, personal communication). Spawning reportedly occurs from July to September (Heemstra and Randall 1993). Prey items include fishes, crustaceans, and squids (Bullock and Smith 1991; Heemstra and Randall 1993).

3.2.1.5 Warsaw grouper, *Epinephelus nigritus*

Warsaw grouper occur in the Western Atlantic from Massachusetts to southeastern Brazil (Robins and Ray 1986), and in the Gulf of Mexico (Smith 1971). The Warsaw grouper is a solitary species (Heemstra and Randall 1993), usually found on rocky ledges and seamounts (Robins and Ray 1986), at depths from 55 to 525 m (180-1,722 ft) (Heemstra and Randall 1993). Juveniles are sometimes observed in inshore waters (Robins and Ray 1986), on jetties and shallow reefs (Heemstra and Randall 1993).

Maximum reported size is 230 cm (91 in) TL (Heemstra and Randall 1993) and 263 kg (580 lbs) (Robins and Ray 1986). The oldest specimen was 41 years old (Manooch and Mason 1987). M was estimated by the SEDAR group during November 2003 to range from 0.05 to 0.12 (SEDAR 4 2004). The warsaw grouper spawns during August, September, and October in the Gulf of Mexico (Peter Hood, NOAA Fisheries, personal communication), and during April and May off Cuba (Naranjo 1956). Adults feed on benthic invertebrates and on fishes (Heemstra and Randall 1993).

3.2.1.6 Snowy Grouper, *Epinephelus niveatus*

Snowy grouper occur in the Eastern Pacific and the Western Atlantic from Massachusetts to southeastern Brazil, including the northern Gulf of Mexico (Robins and Ray 1986). It is found at depths of 30-525 m (98-1,722 ft). Adults occur offshore over rocky bottom habitat. Juveniles are often observed inshore and occasionally in estuaries (Heemstra and Randall 1993).

The snowy grouper is a protogynous species. The smallest, youngest male examined by Wyanski *et al.* (2000) was 72.7 cm (28.8 in) TL and age 8. The median size and age of snowy grouper was 91.9 cm (34.5 in) and age 16. The largest specimen observed was 122 cm (48 in) TL and 30 kg (66 lbs), and 27 years old (Heemstra and Randall 1993). The maximum age reported by Wyanski *et al.* (2000) is 29 years for fish collected off of North Carolina and South Carolina. Radiocarbon techniques indicate that snow grouper may live for as long as 40 years (Harris, South Carolina Department of Natural Resources, personal communication). Wyanski *et al.* (2000) reported that 50% of the females are mature at 54.1 cm (21.3 in) TL and 5 years of age. The smallest mature female was 46.9 cm (18.5 in) TL, and the largest immature female was 57.5 cm (22.6 in) TL.

Females in spawning condition have been captured off western Florida during May, June, and August (Bullock and Smith 1991). In the Florida Keys, ripe individuals have been observed from April to July (Moore and Labinsky 1984). Spawning seasons reported by other researchers are as follows: South Atlantic (north of Cape Canaveral), April through September (Wyanski *et al.* 2000) and April through July (Parker and Mays 1998); and South Atlantic (south of Cape Canaveral), May through July (Manooch 1984). Wyanski *et al.* (2000) reported that snowy grouper spawn at depths from 176 to 232 m (577 to 761 ft) off South Carolina. Adults feed on fishes, gastropods, cephalopods, and crustaceans (Heemstra and Randall 1993).

3.2.1.7 Golden Tilefish, *Lopholatilus chamaeleonticeps*

Golden tilefish 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) (Table 3-1). According to Dooley (1978), golden tilefish occurs 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. It is most commonly found at about 200 meters (656 feet), usually over mud or sand bottom but, occasionally, over rough bottom (Dooley 1978). Tilefish north of the Virginia/North Carolina border are currently managed as part of the Fishery Management Plan for Tilefish managed by the Mid-Atlantic Fishery Management Council. Golden tilefish occurring south of the Virginia/North Carolina boarder are managed by the South Atlantic Fishery Management Council under the Fishery Management Plan for the Snapper-Grouper Fishery of the South Atlantic Region.

Maximum reported size is 125 centimeters (50") total length and 30 kilograms (66 lbs) (Dooley 1978; Robins and Ray 1986). Maximum reported age is 40 years (Harris *et al.* 2001). Radiocarbon aging indicate golden tilefish may live for at least 50 years (Harris, South Carolina Department of Natural Resources, personal communication). A recent SEDAR assessment estimate natural mortality (M) at 0.08 (SEDAR 4 2004). Golden tilefish spawn off the southeast coast of the U.S. from March through late July, with a peak in April (Table 3-1; 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 holothurians (Dooley 1978).

3.2.1.8 Black Sea Bass, *Centropristis striata*

Black sea bass occur in the Western Atlantic, from Maine to southeastern Florida, and in the eastern Gulf of Mexico (McGovern *et al.* 2002) (Table 3-1). Separate populations were reported to exist to the north and south of Cape Hatteras, North Carolina (Wenner *et al.* 1986). However, genetic similarities suggest this is one stock (McGovern *et al.* 2002). This species is common around rock jetties and on rocky bottoms in shallow water (Robins and Ray 1986) at depths from 2-120 meters (7-394 feet). Most adults occur at depths from 20-60 meters (66-197 feet) (Vaughan *et al.* 1995). Black sea bass north of the Virginia/North Carolina border are currently managed as part of the Fishery Management Plan for Summer Flounder, Scup, and Black Sea Bass and are managed by the Mid-Atlantic Fishery Management Council. Black sea bass occurring south of the Virginia/North Carolina boarder are managed by the South Atlantic Fishery Management Council under the Fishery Management Plan for the Snapper-Grouper Fishery of the South Atlantic Region.

Maximum reported size is 66.0 centimeters (26.1") total length and 3.6 kilograms (7.9 lbs) (McGovern *et al.* 2002). Maximum reported age is 10 years (McGovern *et al.* 2002); however, ages as great as 20 years have been recorded in the Mid Atlantic region (Lavenda 1949; Froese and Pauly 2003). Natural mortality is estimated to be 0.30 (SEDAR 2 2003b). The minimum size and age of maturity for females reported off the southeastern U.S. coast is 10.0 centimeters (3.6") standard length and age 0. All females are mature by 18.0 centimeters (7.1") standard length and age 3 (McGovern *et al.* 2002; Table 3-1). Wenner *et al.* (1986) report peak spawning occurs from March through May in the South Atlantic Bight. McGovern *et al.* (2002) indicate black sea bass females are in spawning condition during March-July, with a peak during March through May (McGovern *et al.* 2002). Some spawning also occurs during September and November. Spawning takes place in the evening. Black sea bass change sex from female to male (protogyny). Females dominate the first 5 year classes and individuals over the age of 5 are more commonly males. The size at maturity and the size at transition of black sea bass was smaller in the 1990s than during the early 1980s off the southeast U.S. Black sea bass appear to compensate for the loss of larger males by changing sex at smaller sizes and younger ages (McGovern *et al.* 2002).

The diet of black sea bass is generally composed of shrimp, crab, and fish (Sedberry 1988). Smaller black sea bass eat small crustaceans and larger individuals feed on decapods and fishes.

3.2.1.9 Vermilion Snapper, *Rhomboplites aurorubens*

Vermilion snapper occur in the Western Atlantic, from North Carolina to Rio de Janeiro. It is most abundant off the southeastern United States and in the Gulf of Campeche (Hood and Johnson 1999). The vermilion snapper is demersal, commonly found over rock, gravel, or sand bottoms near the edge of the continental and island shelves (Froese and Pauly 2003). It occurs at depths from 18 to 122 m (59 to 400 ft), but is most abundant at depths less than 76 m (250 ft). Individuals often form large schools. This fish is not believed to exhibit extensive long range or local movement (SEDAR SAR 2 2003).

The maximum size of a male vermilion snapper, reported by Allen (1985) in Froese and Pauly (2003), was 60.0 cm (23.8 in) TL and 3.2 kg (7.1 lbs). Maximum reported age in the South Atlantic Bight was 14 years (Zhao *et al.* 1997; Potts *et al.* 1998). SEDAR 2-SAR2 (2003) recommends that natural mortality (M) be defined as 0.25/yr, with a range of 0.2-0.3/yr.

This species spawns in aggregations (Lindeman *et al.* 2000) from April through late September in the southeastern United States (Cuellar *et al.* 1996). Zhao *et al.* (1997) indicated that most spawning in the South Atlantic Bight occurs from June through August. Eggs and larvae are pelagic. Vermilion snapper are gonochorists meaning that all vermilion snapper are mature at 2 years of age and 20.0 cm (7.9 in) (SEDAR SAR2 2003). Cuellar *et al.* (1996) collected vermilion snapper off the southeastern United States and found that all were mature. The smallest female was 16.5 cm (6.5 in) FL and the smallest male was 17.9 cm (7.1 in) FL (Cuellar *et al.* 1996). Zhao and McGovern (1997) reported that 100% of males that were collected after 1982 along the southeastern United States were mature at 14.0 cm (5.6 in) TL and age 1. All females collected after 1988 were mature at 18.0 cm (7.1 in) TL and age 1.

This species preys on fishes, shrimp, crabs, polychaetes, and other benthic invertebrates, as well as cephalopods and planktonic organisms (Allen 1985). Sedberry and Cuellar (1993) reported that small crustaceans (especially copepods), sergestid decapods, barnacle larvae, stomatopods, and decapods dominated the diets of small (< 50 mm (2 in) SL) vermilion snapper off the Southeastern United States. Larger decapods, fishes, and cephalopods are more important in the diet of larger vermilion snapper.

3.3 Science Underlying the Management of Snapper Grouper Species Most Impacted By This FMP Amendment

The status of gag, vermilion snapper, black sea bass, golden tilefish, snowy grouper has been recently assessed through the Southeast Data, Assessment, and Review (SEDAR) process. Black grouper, red grouper, speckled hind, and warsaw grouper have not been recently assessed.

The SEDAR process consists of a series of workshops aimed at ensuring that each assessment is based on the best available scientific information. First, representatives from NOAA Fisheries Service, state agencies, and the South Atlantic Council, as well as experts from non-governmental organizations and academia, participate in a data workshop. The purpose of a data workshop is to assemble and review available fishery-dependent and fishery-independent data and information on a stock, and to develop consensus about what constitutes the best available scientific information on the stock, how that information should be used in an assessment, and what type of stock assessment model should be employed.

Second, assessment biologists from these agencies and organizations participate in a stock assessment workshop, where data from the data workshop are input into one or more stock assessment models (e.g., production, age-structured, length structured, etc.) to generate estimates of stock status and fishery status. Generally, multiple runs of each model are conducted: base runs and a number of additional runs to examine sensitivity of results to various assumptions (e.g., different natural mortality rates, different data sets/catch periods, etc.).

Finally, a stock assessment review workshop is convened to provide representatives from the Center for Independent Experts the opportunity to peer review the results of the stock assessment workshop. Representatives from NOAA Fisheries Service, the South Atlantic Council, and constituent groups may attend and observe the review but the actual review is conducted by the Center for Independent Experts.

The Council's Scientific and Statistical Committee (SSC) then reviews the report of the stock assessment review workshop.

The review portion of the SEDAR process has helped improve acceptance of stock assessments. However, continued lack of basic fishery data has resulted in uncertainty in the assessment results. Each SEDAR Review Panel has identified significant shortcomings in data and research (see **Section 4.6** for a detailed list of research and data needs). In addition, not all of the reviews have been completed with 100% consensus.

3.3.1 Gag assessment and stock status

SEDAR assessment

The stock of gag off the United States South Atlantic was assessed during a SEDAR assessment workshop, held at the Wyndham Grand Bay Hotel, Miami, Florida, on May 1–5, 2006. The workshop's objectives were to complete the SEDAR 10 benchmark assessment of gag and to conduct stock projections. Participants in the benchmark assessment included state, federal, and university scientists, as well as Council members and staff, and various observers. All decisions regarding stock assessment methods and acceptable data were made by consensus (SEDAR 10 2007).

Available data on the stock included abundance indices, recorded landings, and samples of annual size compositions and age compositions from fishery-dependent sources. Three fishery–dependent abundance indices were developed by the data workshop: one from the NOAA Fisheries Service headboat survey, one from the commercial logbook program, and one from the MRFSS survey. There were no usable fishery–independent abundance data for this stock of gag. Landings data were available from all recreational and commercial fisheries. The assessment included data through 2004.

A forward projecting statistical model of catch at age was used as the primary assessment model. In addition, an age-aggregated production model was used to investigate results under a different set of model assumptions. The assessment workshop developed two base runs: one assuming a time-varying catch ability and one assuming constant catch ability for the fishery dependent indices. Each base run of the catch-at-age model was used for estimation of benchmarks and stock status.

Stock projections were evaluated under five scenarios starting in 2008. Each scenario applied the current fishing mortality rate (F) in years 2005–2007. Starting in 2008, the five projection scenarios included: (1) current F, (2) F_{MSY}, (3) 85% of F_{MSY}, (4) 75% of F_{MSY}, and (5) 65% of F_{MSY}.

Status

The gag stock in the Atlantic is undergoing **overfishing** as of 2004 (last year of data in the stock assessment). This means fish are being removed more quickly than the stock can replace them such that the maximum sustainable yield (MSY) cannot be achieved. The Council compares the current fishing mortality rate (F) to the level of fishing mortality that would result in overfishing (maximum fishing mortality threshold or MFMT) and if the current F is greater than the MFMT, overfishing is occurring. For gag the most recent estimate of the fishing mortality rate (F) is from 2004 and is = 0.310. The Council is using the fishing mortality rate that would produce the maximum sustainable yield (F_{MSY} = 0.237) as the maximum fishing mortality threshold. Comparing these two numbers:

- F_{2004}/MFMT = 0.310/0.237 = 1.309

This comparison is referred to as the **overfishing ratio**. If the ratio is greater than 1, then overfishing is occurring.

The gag stock in the Atlantic was not **overfished** as of the start of 2005. This means that the spawning stock biomass (pounds of spawning fish in the water) has not been reduced below the level that could produce the maximum sustainable yield. The Council compares the current spawning stock biomass (SSB) to the level of spawning stock biomass that could be rebuilt to the level to produce the MSY in 10 years. This is referred to as the minimum spawning stock biomass or MSST. For gag, the estimated level of spawning stock biomass in 2005 was 7,470,000 pounds gutted weight (gw). The Minimum stock size threshold (MSST) = 6,816,000 pounds gw. Comparing these two numbers:

- SSB_{2005}/MSST = 7,470,000/6,816,000 = 1.096

This comparison is referred to as the **overfished ratio**. If the ratio is less than 1, then the stock is overfished.

3.3.2 Vermilion Snapper assessment and stock status

SEDAR assessment

A SEDAR stock assessment workshop was convened at the NOAA Center for Coastal Fisheries and Habitat Research Beaufort, North Carolina, on Monday, April 4, 2007. The workshop's objectives were to conduct an update assessment of the vermilion snapper off the southeastern U.S. and to conduct stock projections based on possible management scenarios. Participants in the update assessment included state and federal scientists, Council AP and SSC members, and various observers. All decisions regarding stock assessment methods and acceptable data were made by consensus (SEDAR Assessment Update #3 2007).

Available data on the species included all those utilized for the benchmark assessment conducted in 2002; no additional data sources were identified during the scoping workshop. These data were abundance indices, recorded landings, and samples of annual size compositions from indices and landings. Four abundance indices were used in the benchmark assessment: one from the NMFS headboat survey and three from the SC MARMAP fishery-independent monitoring program. Landings data were available from all recreational and commercial fisheries. While the MARMAP chevron trap index decreased in recent years, the remaining abundance indices showed neither marked increase nor decline during the assessment period (1976–2006).

The statistical model of catch at length as developed for the benchmark assessment was used as the only assessment model. The assessment workshop provided the base run of the model, identical to that used in the benchmark assessment. This base run was used for the estimation of benchmarks and stock status. The benchmark assessment concluded that the high degree of uncertainty in recruitment and spawning stock biomass estimates meant that reliable biomass based benchmarks could not be developed from the assessment, and this was found to be the case for the update assessment as well.

The ratio of fishing mortality in 2006 to F_{MAX} was 2.05, compared to 1.71 in the benchmark assessment, suggesting that overfishing continues. Projections were used to evaluate the potential of the stock to be rebuilt, but could only be conducted for constant

F scenarios. Four projections were considered: $F=F_{MAX}$; $F=85\%F_{MAX}$; $F=75\%F_{MAX}$; and $F=65\%F_{MAX}$. The results of each were very similar.

Recognizing the need for a new benchmark assessment, NMFS and the state of South Carolina began sampling available vermilion snapper otoliths to enable an age-based assessment. Further, the SEDAR steering committee replaced white grunt in the SEDAR schedule with vermilion snapper. A new age based assessment for vermilion snapper was completed in 2008 (SEDAR 17 2008). Three different model structures were applied: a statistical catch-at-age model, stock reduction analysis, and a surplus production model. In addition, catch curve analysis was used to examine mortality. The primary model was a statistical catch-at-age model implemented with the AD Model Builder software.

Stock Status

The vermilion snapper stock assessment updated indicated the stock in the Atlantic is undergoing **overfishing** as of 2006 (last year of data in the stock assessment update). This means fish are being removed more quickly than the stock can replace them such that the maximum sustainable yield (MSY) cannot be achieved. The Council compares the current fishing mortality rate (F) to the level of fishing mortality that would result in overfishing (maximum fishing mortality threshold or MFMT) and if the current F is greater than the MFMT, overfishing is occurring. For vermilion snapper the most recent estimate of the fishing mortality rate is from 2006 and was = 0.729. The Council is using the fishing mortality rate that produces the greatest yield per fish (F_{MAX} = 0.355) as the maximum fishing mortality threshold. F_{MAX} is being used as a proxy for F_{MSY} (F_{MSY} = Fishing mortality rate that would produce maximum sustainable yield) because the SSC did not have confidence in the calculated biomass reference points. The SSC does have confidence in the fishing mortality rate estimates from the SEDAR assessment. Comparing these two numbers:

- F_{2006}/MFMT = 0.729/0.355 = 2.05

This comparison is referred to as the **overfishing ratio**. If the ratio is greater than 1, then overfishing is occurring. The assessment could not make a determination on the overfished status.

SEDAR 17 (2008) confirmed that the stock is experiencing overfishing but indicated the stock is not overfished. The base run of the catch-at-age model estimated the current stock status to be:

SSB_{2007}/SSB_{MSY} = 0.86 and
SSB_{2007}/MSST = 1.10, both indicating the stock is not overfished.

It estimated the current fishery status in 2007 to be:

F_{2007}/F_{MSY} = 1.27, indicating the stock was subject to overfishing in 2007.

3.3.3 Black sea bass assessment and stock status

SEDAR assessment

Black sea bass was assessed at the second SEDAR (SEDAR 2 2003b). Data for the SEDAR assessment were assembled and reviewed at a data workshop held during the week of October 7, 2002 in Charleston, South Carolina. The assessment utilized commercial and recreational landings, as well as abundance indices and life history information from fishery-independent and fishery-dependent sources. Six abundance indices were developed by the data workshop. Two CPUE indices were used from the NMFS headboat survey (1978-2001) and the MRFSS recreational survey (1992-1998). Four indices were derived from CPUE observed by the South Carolina MARMAP fishery-independent monitoring program ("Florida" trap index, 1981-1987; blackfish trap index, 1981-1987; hook and line index, 1981-1987; and chevron trap index, 1990-2001) (SEDAR 2 2003b).

Age-structured and age-aggregated production models were applied to available data at the assessment workshop. The age-structured model was considered the primary model, as recommended by participants in the data workshop. The stock assessment indicated black sea bass was overfished and overfishing was occurring.

At the request of the South Atlantic Council, the SEDAR panel convened to update the 2003 black sea bass stock assessment, using data through 2003, and to conduct stock projections based on possible management scenarios (SEDAR Update #1 2005). The update indicated the stock was still overfished and overfishing was still occurring but results showed the stock was much more productive that previously indicated. The stock could be rebuilt to the biomass level capable of producing the maximum sustainable yield in 5 years if all fishing mortality were eliminated; previously this was estimated to take 11 years (SEDAR 2 2003b).

Stock Status

The black sea bass stock in the Atlantic is undergoing **overfishing** and is **overfished** as of 2004 (last year of data in the stock assessment update). For black sea bass the most recent estimate of the fishing mortality rate is from 2003 and was = 2.64 and F_{MSY} = 0.429 as the maximum fishing mortality threshold. Comparing these two numbers:

- F_{2003}/MFMT = 0.729/0.355 = 6.15

This comparison is referred to as the **overfishing ratio**. If the ratio is greater than 1, then overfishing is occurring.

The black sea bass stock in the Atlantic is **overfished**. For black sea bass, the estimated level of spawning stock biomass in 2005 was 4,099,884 pounds whole weight. The Minimum stock size threshold (MSST) = 10,511,633 pounds whole weight. Comparing these two numbers:

- SSB_{2005}/MSST = 4,099,884/10,511,633 = 0.39

If the ratio is less than 1, then the stock is overfished.

3.3.4 Snowy grouper assessment and stock status

SEDAR assessment

The data workshop convened in Charleston, SC during the week of November 3, 2003 to examine data from eight deep-water species for assessment purposes (SEDAR 4 2004). The group determined that data were adequate to conduct assessments on snowy grouper and tilefish. Four indices were available for snowy grouper including a logbook index, headboat index, MARMAP trap index, and MARMAP short longline index. The assessment workshop chose not to use the logbook index for snowy grouper since this species forms aggregations and has been known to be taken in large numbers over wrecks. Commercial and recreational landings as well as life history information from fishery-independent and fishery-dependent sources were used in the assessment.

Estimates were made of several time series of management interest. These include annual exploitation rate, fishing mortality rate, total landings, number of recruits, mature biomass, and total biomass. Results show a population beginning a decline as early as 1966, reaching its lowest levels in the most recent years. Increasing exploitation of snowy grouper begins at about the same time as the population decline, which coincides with an increase in the reported landings of snowy grouper.

Stock Status

The snowy grouper stock in the Atlantic is undergoing **overfishing** and is **overfished** as of 2004 (last year of data in the stock assessment). For snowy grouper the most recent estimate of the fishing mortality rate is from 2002 and was = 0.154 and F_{MSY} = 0.05 as the maximum fishing mortality threshold. Comparing these two numbers:

- F_{2002}/MFMT = 0.154/0.05 = 3.08

This comparison is referred to as the **overfishing ratio**. If the ratio is greater than 1, then overfishing is occurring.

The snowy grouper stock in the Atlantic is **overfished**. For snowy grouper, the estimated level of spawning stock biomass in 2003 was 869,503 pounds whole weight. The Minimum stock size threshold (MSST) = 3,498,735 pounds whole weight. Comparing these two numbers:

- SSB_{2003}/MSST = 869,503/3,498,735 = 0.25

If the ratio is less than 1, then the stock is overfished. In the absence of fishing it was determined that it would take 13 years to rebuild the stock to B_{MSY}. The maximum recommended rebuilding time is 34 years based on the formula: T_{MIN} (13 years) + one generation time (21 years).

The estimated stock status for snowy grouper in 2002 is quite low, median of 18% for $SSB_{(2002)}/SSB_{MSY}$. This corresponds to a stock status in 2002 relative to the virgin stock size [$SSB_{(2002)}$/SSBvirgin] of about 5%. The input data for the assessment model do not include a consistent abundance index that covers the whole time period of the model. The headboat CPUE and length composition data extends back to 1972, but changes in the fishery make interpretation of the observed trends in this index difficult. The headboat fishery moved inshore during the data period and consequently selectivity in the

fishery changed. In the age-structured modeling, this was accommodated by dividing the headboat index into three time periods: with constant selectivity in 1972–1976, a possibly different constant selectivity in 1992–2002, and selectivity varying between them in 1977–1991. The other abundance indices do not start until 1990 or later. Therefore, the model must rely on data sources other than abundance indices for determining stock status.

Other data that provide information on stock status are the average weight and length from the fisheries landings as well as the observed age and length composition data. The 2002 average weights and lengths from the commercial fisheries suggest the population is at very low levels. The average weight and length in 2002 from the handline fishery suggests the population is near 11% and 3% of SSB_{MSY}, respectively. The average weight and length in 2002 from the longline fishery suggests the population is near 44% and 28% of SSB_{MSY}, respectively. The length composition data from the most recent years (2000-2002) also suggests a depleted population of snowy grouper. The observed length distributions are skewed toward smaller fish compared to an equilibrium, virgin state length composition.

3.3.5 Golden tilefish assessment and stock status

There two indices of abundance available for the golden tilefish stock assessment. A fishery-independent index was developed from MARMAP horizontal longlines (SEDAR 4 2004). A fishery-dependent index was developed from commercial logbook data during the data workshop. Commercial and recreational landings as well as life history information from fishery-independent and fishery-dependent sources were used in the assessment. A statistical catch-at-age model and a production model were used to assess the golden tilefish population.

Exploitation status in 2002 was analyzed relative to the maximum fishing mortality threshold (MFMT; limit reference point in *F*). The MFMT was assumed equal to E_{MSY} or F_{MSY}, depending on the measure of exploitation. Stock status in 2002 was estimated relative to SSB_{MSY} and to maximum spawning size threshold (MSST). The MSST was computed as a fraction *c* of SSB_{MSY}. Restrepo *et al.* (1998) recommend a default definition for that fraction: $c=\max(1 - M,1/2)$, where *M* is the natural mortality rate. However, this definition does not account for age-dependent *M*, as was used in this assessment. Hence to accommodate the default definition, a constant *M* was computed that would correspond to an age-dependent *M*, by providing the same proportion of survivors at the maximum observed age [$M = -\log(P)/A$, where *P* is the proportion survivors at maximum observed age *A*]. This value of constant *M* was computed uniquely for each of the MCB runs.

Overfishing of golden tilefish (F>MFMT) began in the early 1980's and has continued in most years since then. The population responded to the fishing with a steady population decline to levels near SSB_{MSY} starting in the mid-1980's. The median value of $E_{(2002)}/E_{MSY}$ is 1.55, with a 10_{th} to 90_{th} percentile range of [0.77,3.25]. The median value of $F_{(2002)}/F_{MSY}$ is 1.53, with a range of [0.72,3.31]. The median value of $SSB_{(2002)}/SSB_{MSY}$ is 0.95, with a range of [0.61,1.53]. The median value of $SSB_{(2002)}$/MSST is 1.02, with a range of [0.65,1.67].

It appears likely that overfishing was occurring in 2002; however it is less clear whether the stock was overfished in 2002. The data do not include an abundance index that covers the entire assessment period. To determine stock status, therefore, the assessment must rely in part on other data sources, such as average weight and length from landings as well as the observed age and length composition data. This was explored in the following way: Assuming an equilibrium age-structure, the predicted average weight of landed fish from commercial fisheries is portrayed as a function of stock status. The average weight in 2002 from the handline fishery suggests that the population is near 52% of SSB_{MSY}; the average weight in 2002 from the longline fishery suggests that the population is near 100.1% of SSB_{MSY}. Taken together, these results are consistent with those from the assessment model that the stock is on the border between overfished and not overfished, and that the variability around the point estimate of stock status includes both possibilities. The length composition data from the most recent years (2000 to 2002) also suggests that golden tilefish SSB is near SSB_{MSY}. Observed length distributions are skewed toward smaller fish as compared to an equilibrium virgin length composition, but correspond to the predicted length composition at SSB_{MSY}. Under F=0, the median projection depicts a tilefish stock that recovers to SSB_{MSY} within one year.

3.3.6 Black grouper assessment and stock status

The 2007 Report to Congress (NMFS 2008) indicates black grouper are undergoing overfishing and the overfished status is unknown. Black grouper was assessed for the 1988, 1990, 1996, and 1999 fishing years (NMFS 1991; Huntsman *et al.* 1992; Potts and Brennan 2001). The assumption of ½ L_∞ as the age of maturity was used for estimating the static SPR. SPR values were 0.37%, 0.41%, 0.18%, and 0.18% for 1988, 1990, 1996, and 1999 fishing years, respectively.

3.3.7 Red grouper assessment and stock status

The 2007 Report to Congress (NMFS 2008) indicates red grouper are undergoing overfishing and the overfished status is unknown. Red grouper was assessed for the 1988, 1990, 1996, and 1999 fishing years (NMFS 1991; Huntsman *et al.* 1992; Potts and Brennan 2001). The assumption of ½ L_∞ as the age of maturity was used for estimating the static SPR. SPR values were 0.41%, 0.61%, 0.19%, and 0.28% for 1988, 1990, 1996, and 1999 fishing years, respectively.

3.3.8 Warsaw grouper assessment and stock status

The 2007 Report to Congress (NMFS 2008) indicates warsaw grouper are undergoing overfishing and the overfished status is unknown. Warsaw grouper was assessed by catch curve analysis using data from 1988 and 1990 (Huntsman *et al.* 1992). Because warsaw grouper are infrequently caught, a single length frequency was constructed from several years (e.g., 1983-1988) for the assessment of the 1988 fishing year and 1989-

1990 length samples were used for the 1990 fishing year. A limited age length key was applied to the length frequency to obtain catch-at-age data. No reproductive biology data were available; therefore, for SPR calculations the assumption for age-at-maturity was based on ½ L_∞. Static SPR values for warsaw grouper were 0.2% and 6% for 1988 and 1990 fishing years, respectively.

3.3.9 Speckled hind assessment and stock status

The 2007 Report to Congress (NMFS 2008) indicates speckled hind are undergoing overfishing and the overfished status is unknown. Speckled hind was assessed for the 1988, 1990, 1996, and 1999 fishing years (NMFS 1991; Huntsman *et al.* 1992; Potts and Brennan 2001). Length frequencies for each fishing year assessed was constructed from that year's data. Length samples came primarily from the commercial fishery. Lengths for 1996 and 1999 were limited by the management restriction of one speckled hind per trip. Age and growth data were available but there were no reproductive biology data. The assumption of ½ L_∞ as the age of maturity was used for estimating the static SPR. SPR values were 25%, 12%, 8%, and 5% for 1988, 1990, 1996, and 1999 fishing years, respectively.

3.4 Other Affected Council-Managed Species

Gag and vermilion snapper are targeted by fishermen and are commonly taken on trips together. Red grouper, scamp, blueline tilefish, red snapper, gray triggerfish, greater amberjack, white grunt, and others are also targeted by commercial fishermen and are taken on trips with gag and vermilion snapper. Gag and vermilion snapper are commonly taken on trips by recreational fishermen with white grunt, black sea bass, red snapper, gray triggerfish, and red porgy. A detailed description of the life history of these species is provided in the snapper grouper SAFE report (NMFS 2005).

3.5 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 MMPA and six are also listed as endangered under the ESA (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales). There are only three known interactions between the South Atlantic snapper grouper fishery and marine mammals. All three marine mammals were likely dolphins, all were caught in Florida on handline gear, and all three animals were released alive. Other species protected under the ESA occurring in the South Atlantic include five species of sea turtle (green, hawksbill, Kemp's ridley, leatherback, and loggerhead); the smalltooth sawfish; and two *Acropora* coral species (elkhorn [*Acropora palmata*] and staghorn [*A. cervicornis*]). A discussion of these species is included below. Designated critical habitat for the *Acropora* corals also occurs within the South Atlantic region.

The impacts of the South Atlantic snapper grouper fishery on ESA-listed species have been evaluated in a biological opinion on the continued authorization of snapper grouper fishing under the South Atlantic Snapper Grouper Fishery Management Plan and Amendment 13C (NMFS 2006), and during subsequent informal ESA section 7 consultations. The biological opinion stated the fishery was not likely to adversely affect any critical habitat or marine mammals (see NMFS 2006 for discussion on these species). However, the opinion did state that the snapper grouper fishery would adversely affect sea turtles and smalltooth sawfish. A discussion of these species is included below.

NOAA Fisheries Service conducted an informal Section 7 consultation on July 9, 2007, evaluating the impacts of the South Atlantic snapper grouper fishery on ESA-listed *Acropora* species. The consultation concluded that the continued operation of the snapper grouper fishery was not likely to adversely affect newly listed *Acropora* species. On November 26, 2008, a final rule designating *Acropora* critical habitat was published in the *Federal Register*. A memo dated December 2, 2008, evaluated the effects of the continued authorization of the South Atlantic snapper grouper fishery on *Acropora* critical habitat pursuant to section 7 of the ESA. The evaluation concluded the proposed actions are not likely to adversely affect *Acropora* critical habitat.

3.5.1 ESA-Listed Sea Turtles

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

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

The hawksbill's pelagic stage lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 cm in straight carapace length (Meylan 1988, Meylan and Donnelly 1999). The pelagic stage is followed by residency in developmental habitats (foraging areas where juveniles reside and grow) in coastal

waters. Little is known about the diet of pelagic stage hawksbills. Adult foraging typically occurs over coral reefs, although other hard-bottom communities and mangrove-fringed areas are occupied occasionally. Hawksbills show fidelity to their foraging areas over several years (Van Dam and Diéz 1998). The hawksbill's diet is highly specialized and consists primarily of sponges (Meylan 1988). Gravid females have been noted ingesting coralline substrate (Meylan 1984) and calcareous algae (Anderes Alvarez and Uchida 1994), which are believed to be possible sources of calcium to aid in eggshell production. The maximum diving depths of these animals are not known, but the maximum length of dives is estimated at 73.5 minutes. More routinely, dives last about 56 minutes (Hughes 1974).

Kemp's ridley hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr 1987, Ogren 1989). Once the juveniles reach approximately 20 cm carapace length they move to relatively shallow (less than 50m) benthic foraging habitat over unconsolidated substrates (Márquez-M. 1994). They have also been observed transiting long distances between foraging habitats (Ogren 1989). Kemp's ridleys feeding in these nearshore areas primarily prey on crabs, though they are also known to ingest mollusks, fish, marine vegetation, and shrimp (Shaver 1991). The fish and shrimp Kemp's ridleys ingest are not thought to be a primary prey item but instead may be scavenged opportunistically from bycatch discards or from discarded bait (Shaver 1991). Given their predilection for shallower water, Kemp's ridleys most routinely make dives of 50 m or less (Soma 1985, Byles 1988). Their maximum diving range is unknown. Depending on the life stage a Kemp's ridleys may be able to stay submerged anywhere from 167 minutes to 300 minutes, though dives of 12.7 minutes to 16.7 minutes are much more common (Soma 1985, Mendonca and Pritchard 1986, Byles 1988). Kemp's ridleys may also spend as much as 96% of their time underwater (Soma 1985, Byles 1988).

Leatherbacks are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. Although they will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, leatherbacks' diets do not shift during their life cycles. Because leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive in excess of 1000 m (Eckert *et al.* 1989) but more frequently dive to depths of 50 m to 84 m (Eckert *et al.* 1986). Dive times range from a maximum of 37 minutes to more routines dives of 4 to 14.5 minutes (Standora *et al.* 1984, Eckert *et al.* 1986, Eckert *et al.* 1989, Keinath and Musick 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora *et al.* 1984).

Loggerhead hatchlings forage in the open ocean and are often associated with *Sargassum* rafts (Hughes 1974, Carr 1987, Walker 1994, Bolten and Balazs 1995). The pelagic stage of these sea turtles are known to eat a wide range of things including salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma 1972). Stranding records indicate that when pelagic immature loggerheads reach 40-60 cm

straight-line carapace length they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic (Witzell 2002). Here they forage over hard- and soft-bottom habitats (Carr 1986). Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke *et al.* 1993). Estimates of the maximum diving depths of loggerheads range from 211 m to 233 m (692-764ft.) (Thayer *et al.* 1984, Limpus and Nichols 1988). The lengths of loggerhead dives are frequently between 17 and 30 minutes (Thayer *et al.* 1984, Limpus and Nichols 1988, Limpus and Nichols 1994, Lanyan *et al.* 1989) and they may spend anywhere from 80 to 94% of their time submerged (Limpus and Nichols 1994, Lanyan *et al.* 1989).

3.5.2 ESA-Listed Marine Fish

Historically the smalltooth sawfish in the U.S. ranged from New York to the Mexico border. Their current range is poorly understood but believed to have contracted from these historical areas. In the South Atlantic region, they are most commonly found in Florida, primarily off the Florida Keys (Simpfendorfer and Wiley 2004). Only two smalltooth sawfish have been recorded north of Florida since 1963 [the first was captured off North Carolina in 1963 and the other off Georgia in 2002 (National Smalltooth Sawfish Encounter Database, Florida Museum of Natural History)]. Historical accounts and recent encounter data suggest that immature individuals are most common in shallow coastal waters less than 25 meters (Bigelow and Schroeder 1953, Adams and Wilson 1995), while mature animals occur in waters in excess of 100 meters (Simpfendorfer pers. comm. 2006). Smalltooth sawfish feed primarily on fish. Mullet, jacks, and ladyfish are believed to be their primary food resources (Simpfendorfer 2001). Smalltooth sawfish also prey on crustaceans (mostly shrimp and crabs) by disturbing bottom sediment with their saw (Norman and Fraser 1938, Bigelow and Schroeder 1953).

3.5.3 ESA-Listed Marine Invertebrates

Elkhorn (*Acropora palmata)* and staghorn (*A. cervicornis*) corals were listed as threatened under the ESA on May 9, 2006. The Atlantic *Acropora* Status Review (*Acropora* Biological Review Team 2005) presents a summary of published literature and other currently available scientific information regarding the biology and status of both these species.

Elkhorn and staghorn corals are two of the major reef-building corals in the wider Caribbean. In the South Atlantic region, they are found most commonly in the Florida Keys; staghorn coral occurs the furthest north with colonies documented off Palm Beach, Florida (26º3'N latitude). The depth range for these species ranges from <1 m to 60 m. The optimal depth range for elkhorn is considered to be 1 to 5 m depth (Goreau and Wells 1967), while staghorn corals are found slightly deeper, 5 to 15 m (Goreau and Goreau 1973).

All Atlantic *Acropora* species (including elkhorn and staghorn coral) are considered to be environmentally sensitive, requiring relatively clear, well-circulated water (Jaap *et al.* 1989). Optimal water temperatures for elkhorn and staghorn coral range from 25° to 29°C (Ghiold and Smith 1990, Williams and Bunkley-Williams 1990). Both species are almost entirely dependent upon sunlight for nourishment, contrasting the massive, boulder-shaped species in the region (Porter 1976, Lewis 1977) that are more dependent on zooplankton. Thus, Atlantic *Acropora* species are much more susceptible to increases in water turbidity than some other coral species.

Fertilization and development of elkhorn and staghorn corals is exclusively external. Embryonic development culminates with the development of planktonic larvae called planulae (Bak *et al.* 1977, Sammarco 1980, Rylaarsdam 1983). Unlike most other coral larvae, elkhorn and staghorn planulae appear to prefer to settle on upper, exposed surfaces, rather than in dark or cryptic ones (Szmant and Miller 2006), at least in a laboratory setting. Studies of elkhorn and staghorn corals indicated that larger colonies of both species had higher fertility rates than smaller colonies (Soong and Lang 1992).

3.5.4 South Atlantic Snapper Grouper Fishery Interactions with ESA-Listed Species

Sea turtles are vulnerable to capture by bottom longline and vertical hook-and-line gear. The magnitude of the interactions between sea turtles and the South Atlantic snapper grouper fishery was evaluated in NMFS (2006) using data from the Supplementary Discard Data Program (SDDP). Three loggerheads and three unidentified sea turtles were caught on vertical lines; one leatherback and one loggerhead were caught on bottom longlines, all were released alive (Table 3-1). The effort reported program represented between approximately 5% and 14% of all South Atlantic snapper grouper fishing effort. These data were extrapolated in NMFS (2006) to better estimate the number of interactions between the entire snapper grouper fishery and ESA-listed sea turtles. The extrapolated estimate was used to project future interactions (Table 3-2).

The SDDP does not provide data on recreational fishing interactions with ESA-listed sea turtle species. However, anecdotal information indicates that recreational fishermen occasionally take sea turtles with hook-and-line gear. The biological opinion also used the extrapolated data from the SDDP to estimate the magnitude of recreational fishing on sea turtles (Table 3-2).

Smalltooth sawfish are also considered vulnerable to capture by bottom longline and vertical hook-and-line gear based on their capture in other southeast fisheries using such gear (Poulakis and Seitz 2004; Simpfendorfer and Wiley 2004). SDDP data does not include any reports of smalltooth sawfish being caught in the South Atlantic commercial snapper grouper fishery. There are no other documented interactions between smalltooth sawfish and the South Atlantic commercial snapper grouper fishery. However, the potential for interaction, led NOAA Fisheries Service to estimate future interactions

between smalltooth sawfish and the snapper grouper fishery in the 2006 biological opinion (Table 3-2).

Regulations proposed under snapper grouper amendment 15B (74 FR 31225; June 30, 2009) would require all commercial or charter/headboat vessels with a South Atlantic snapper-grouper permit, carrying hook-and-line gear on board, to possess required literature and release gear to aid in the safe release of incidentally caught sea turtles and smalltooth sawfish.

Table 3-1. Sea turtle incidental take data from the supplementary discard data program (SDDP) for the Southeast U.S. Atlantic.

Reporting Period	Month	Logbook Statistical Grid	Species Caught	Number Caught	Discard Condition
Vertical Hook-and-Line Sea Turtle Catch Data					
8/1/01-7/31/02	April	2482	Unidentified	1	Alive
8/1/01-7/31/02	November	3377	Loggerhead	1	Alive
8/1/02-7/31/03	February	2780	Loggerhead	1	Alive
8/1/02-7/31/03	November	3474	Loggerhead	1	Alive
8/1/02-7/31/03	November	3476	Unknown	1	Alive
8/1/02-7/31/03	December	3476	Unknown	1	Alive
Bottom Longline Sea Turtle Catch Data					
8/1/01-7/31/02	August	3674	Leatherback	1	Alive
8/1/03-7/31/04	January	3575	Loggerhead	1	Unknown

Source: SEFSC Supplementary Discard Data Program

Table 3-2. Three year South Atlantic anticipated takes of ESA-Listed species for snapper grouper gear.

Species	Amount of Take	Total
Green	Total Take	39
	Lethal Take	14
Hawksbill	Total Take	4
	Lethal Take	3
Kemp's ridley	Total Take	19
	Lethal Take	8
Leatherback	Total Take	25
	Lethal Take	15
Loggerhead	Total Take	202
	Lethal Take	67
Smalltooth sawfish	Total Take	8
	Lethal Take	0

Source: NMFS 2006

3.6 Administrative Environment

3.6.1 The Fishery Management Process and Applicable Laws

3.6.1.1 Federal Fishery Management

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

Responsibility for Federal fishery management decision-making is divided between the U.S. Secretary of Commerce and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary of Commerce (Secretary) is responsible for collecting and providing the data necessary for the councils to prepare fishery management plans and for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the M-Magnuson-Stevens Act and with other applicable laws summarized in Section 7.0. In most cases, the Secretary has delegated this authority to NOAA Fisheries Service.

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

Public interests also are involved in the fishery management process through participation on Advisory Panels and through council meetings, which, with few exceptions for discussing personnel matters, are open to the public. The Council uses a Scientific and Statistical Committee to review the data and science being used in

assessments and fishery management plans/amendments. In addition, the regulatory process is in accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking.

3.6.1.2 State Fishery Management

The state governments of North Carolina, South Carolina, Georgia, and Florida have the authority to manage fisheries that occur in waters extending three nautical miles from their respective shorelines. North Carolina's marine fisheries are managed by the Marine Fisheries Division of the North Carolina Department of Environment and Natural Resources. The Marine Resources Division of the South Carolina Department of Natural Resources regulates South Carolina's marine fisheries. Georgia's marine fisheries are managed by the Coastal Resources Division of the Department of Natural Resources. The Marine Fisheries Division of the Florida Fish and Wildlife Conservation Commission is responsible for managing Florida's marine fisheries. Each state fishery management agency has a designated seat on the South Atlantic Council. The purpose of state representation at the Council level is to ensure state participation in Federal fishery management decision-making and to promote the development of compatible regulations in state and Federal waters.

The South Atlantic States are also involved through the Atlantic States Marine Fisheries Commission (ASMFC) in management of marine fisheries. This commission was created to coordinate state regulations and develop management plans for interstate fisheries. It has significant authority, through the Atlantic Striped Bass Conservation Act and the Atlantic Coastal Fisheries Cooperative Management Act, to compel adoption of consistent state regulations to conserve coastal species. The ASFMC also is represented at the Council level, but does not have voting authority at the Council level.

NOAA Fisheries Service' State-Federal Fisheries Division is responsible for building cooperative partnerships to strengthen marine fisheries management and conservation at the state, inter-regional, and national levels. This division implements and oversees the distribution of grants for two national (Inter-jurisdictional Fisheries Act and Anadromous Fish Conservation Act) and two regional (Atlantic Coastal Fisheries Cooperative Management Act and Atlantic Striped Bass Conservation Act) programs. Additionally, it works with the ASMFC to develop and implement cooperative State-Federal fisheries regulations.

3.7 Enforcement

Both the National Oceanic and Atmospheric Administration (NOAA) Fisheries Office for Enforcement (NOAA/OLE) and the United States Coast Guard (USCG) have the authority and the responsibility to enforce South Atlantic Council regulations. NOAA/OLE agents, who specialize in living marine resource violations, provide fisheries expertise and investigative support for the overall fisheries mission. The USCG is a multi-mission agency, which provides at sea patrol services for the fisheries mission.

Neither NOAA/OLE nor the USCG can provide a continuous law enforcement presence in all areas due to the limited resources of NOAA/OLE and the priority tasking of the USCG. To supplement at sea and dockside inspections of fishing vessels, NOAA entered into Cooperative Enforcement Agreements with all but one of the States in the Southeast Region (North Carolina), which granted authority to State officers to enforce the laws for which NOAA/OLE has jurisdiction. In recent years, the level of involvement by the States has increased through Joint Enforcement Agreements, whereby States conduct patrols that focus on Federal priorities and, in some circumstances, prosecute resultant violators through the State when a state violation has occurred.

NOAA General Counsel issued a revised Southeast Region Magnuson-Stevens Act Penalty Schedule in June 2003, which addresses all Magnuson-Stevens Act violations in the Southeast Region. In general, this Penalty Schedule increases the amount of civil administrative penalties that a violator may be subject to up to the current statutory maximum of $120,000 per violation.

3.8 Human Environment

3.8.1 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.

3.8.1.1 Gear and Fishing Behavior

The commercial snapper grouper fishery utilizes vertical lines, longlines, black sea bass pots/traps, spears, and powerheads (i.e., spears with spring-loaded firearms). Vertical lines are used from the North Carolina/Virginia border to the Atlantic side of Key West, Florida. The majority of hook and line fishermen use either electric or hydraulic reels (bandit gear) and generally have 2-4 bandit reels per boat. Historically, the majority of the bandit fleet fished year round for snapper grouper with the only seasonal differences in catch associated with the regulatory spawning season closures in March and April for gag. Recently, Snapper Grouper FMP Amendment 16 implemented a closed season from January through April for shallow water grouper and a commercial quota for vermilion snapper that could result in closures if the spring and/or fall sub-quotas are filled. Most fluctuations in fishing effort during the open seasons in this fishery are a result of the weather. Trips can be limited during hurricane season and during the winter months from December through March. Some fishermen stop bandit fishing to target king mackerel when they are running.

The Council allows the use of bottom longlines north of St. Lucie Inlet, Florida, in depths greater than 50 fathoms. Bottom longline gear is used to target snowy grouper and golden tilefish. Longline boats are typically bigger than bandit boats, their trips are longer, and they cost more to operate because they operate farther offshore. A longline spool generally holds about 15 miles of cable. Longlines are fished from daylight to dark because sea lice eat the flesh of hooked fish at night. The fishery is operated year long with little or no seasonal fluctuation barring hurricane disruption.

Spears or powerheads are most commonly used off Florida and are illegal for killing snapper grouper species in South Carolina and in Special Management Zones.

Black sea bass pots are used exclusively to target black sea bass, though bycatch of other snapper grouper species is allowed. The pots have mesh size, material, and construction restrictions to facilitate bycatch reduction. All sea bass pots must have a valid identification tag attached and more than 87% of tags in April 2003 were for vessels with homeports in North Carolina. Fishing practices vary by buoy practices, setting/pulling strategies, number of pots set, and length of set, with seasonal variations. The South Carolina pot fishery is mainly a winter fishery with short soak times (in some cases about an hour) and relatively few pots per boat. Most trips are day trips with pots being

retrieved before heading to port. The North Carolina pot fishery also is primarily a winter fishery with some fishermen continuing to pot through the summer. North Carolina fishermen tend to use more pots than those in South Carolina. Although most North Carolina trips with sea bass pots last one day, more pots are left to soak for several days than in South Carolina. Many participants in the black sea bass fishery are active in other fisheries, including the recreational charter fishery during the summer months. Many snapper grouper permit holders maintain pot endorsements but are not active in the pot fishery.

3.8.1.2 Landings, Revenue and Economic Impact

The NOAA Fisheries southeast logbook database, is used to analyze commercial fishing behavior at the boat and trip level (Table 3-3).[1]

Over the period 2003-2007, logbook-reported landings for snapper grouper averaged 6.4 million pounds and $13.8 million in 2007 dollars. Adding the $2.3 million for other species landed on the same trips, the trip value comes to $16.1 million (2007 dollars, Table 3-3). For the 890 boats that made these snapper grouper trips, the ex-vessel value for logbook-reported landings for all trips/species averaged $22.8 million. During these five years, the comparable annual average gross revenue was in the range of $24,000 to $27,000 per boat (median, $9,650 to $10,740 per boat; maximum, $210,000 to $360,000 per boat, all data in 2007 dollars). Note that adding what was not reported in the logbooks (ALS data see footnote 1), landings may have been 861,000 pounds and $569,000 higher in 2003-2007[2].

Estimates of the economic impacts of the commercial snapper grouper fishery are derived using the model developed for and applied in NMFS (2009c). Based on the average annual ex-vessel revenues for all snapper grouper species over the period 2003-2007 of $13.8 million (2007 dollars), the commercial snapper grouper fishery is estimated to support 2,679 full time equivalent (FTE) jobs and generate approximately $182 million in output (sales) impacts and approximately $77 million in income impacts per year to the U.S. economy. Among the jobs supported, 350 FTE jobs are estimated to be in the harvesting sector and 213 FTE jobs are in the dealer/processor sector. Approximately two-thirds of the jobs supported by the commercial snapper grouper fishery are estimated to accrue to the restaurant sector. The estimates of economic activity include the direct effects (effects in the sector where an expenditure is actually made), indirect effects (effects in sectors providing goods and services to directly affected sectors), and induced

[1] Fishermen are required to report their landings by species and by trip to NOAA Fisheries Service Southeast Fisheries Science Center logbook program. However, they do not report prices or revenue on their logbook sheets. Therefore, trip revenue were approximated as reported landings from individual logbook reports multiplied by average monthly prices for each species as calculated from the NOAA Fisheries Service Accumulated Landings System (ALS). To obtain values in 2007 dollars, the BLS Consumer Price Index for urban dwellers was used to adjust for the effects overall price inflation in the U.S. economy at the consumer level.

effects (effects induced by the personal consumption expenditures of employees in the direct and indirectly affected sectors).

Vessels that harvested snapper grouper species also harvested other species on the trips where snapper grouper were harvested, as well as on other trips on which no snapper grouper were harvested. All revenues from all species on all these trips contributed towards making these vessels economically viable and contribute to the economic activity associated with these vessels. The average annual total ex-vessel revenues from all species (including snapper grouper) harvested during this period (2003-2007) by vessels that harvested snapper grouper species was approximately $22.8 million (2007 dollars). The economic activity associated with these revenues is estimated to support 4,426 FTE jobs (578 in the harvesting sector and 352 in the dealer/processor sector) and generate approximately $300 million in output (sales) impacts and approximately $128 million in income impacts.

From an economic activity perspective, among the species which this amendment addresses, vermilion snapper generates the largest average annual ex-vessel revenues, approximately $2.5 million, followed by gag at approximately $1.8 million. The economic activity associated with these two species is estimated to support 485 FTE jobs (63 in the harvest sector and 89 in the dealer/processor sector), respectively. All harvests by the respective vessels that harvest these species support approximately 2,000 FTE jobs (260 in the harvest sector and 158 in the dealer/processor sector). It should be noted, however, that these estimates for the economic activity associated with the harvest of all species by vessels that harvest either vermilion snapper or gag are not additive because some, if not many, of these individual vessels likely harvest both species.

Figure 3-1. Commercial landings & revenue, snapper -grouper

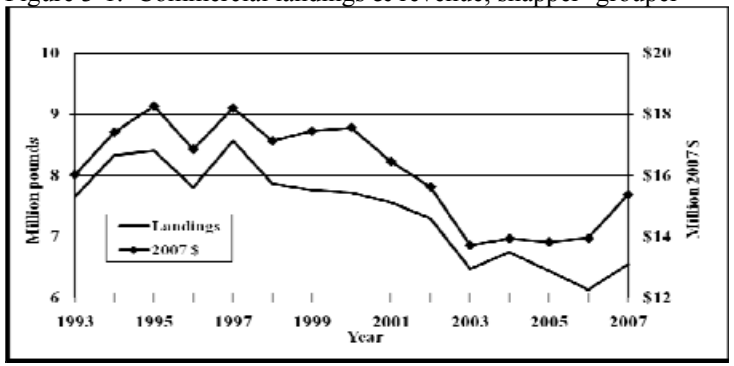


Figure 3-2. Days at sea and trips, snapper grouper

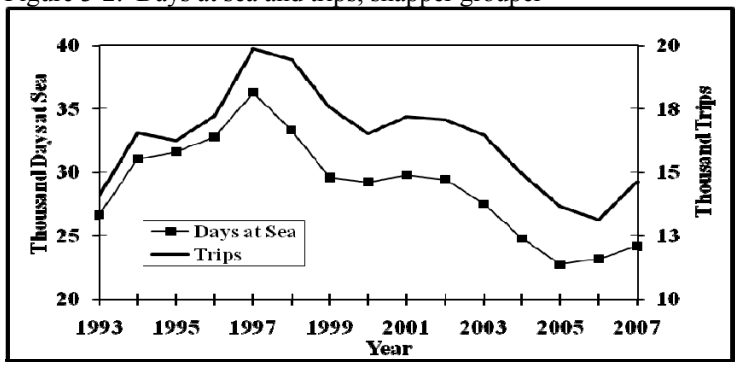


Figure 3-3. Boats and trips, snapper grouper

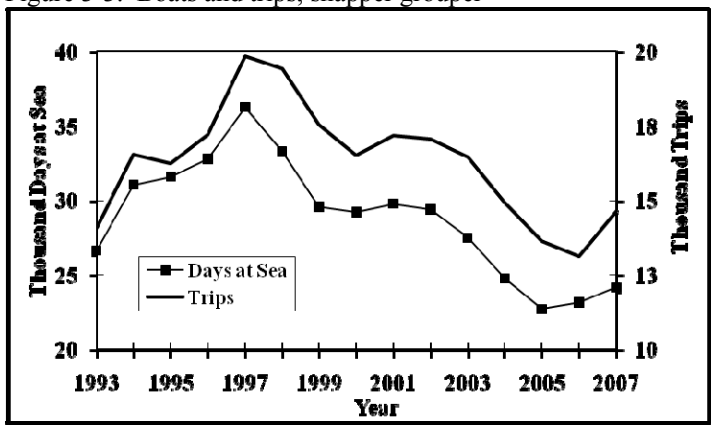
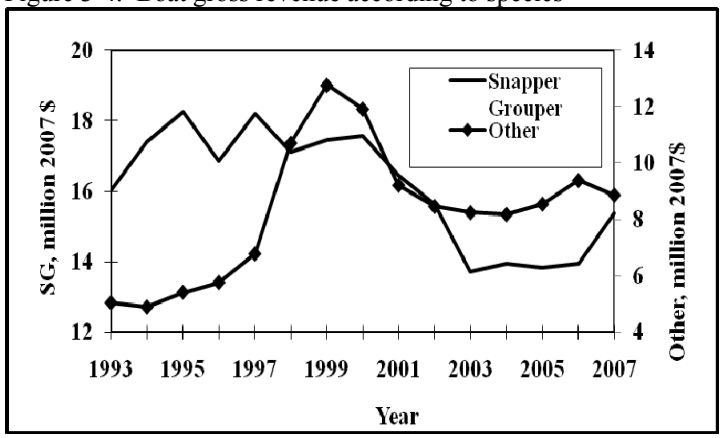


Figure 3-4. Boat gross revenue according to species



Figures 3-1 – 3-4. Commercial landings and revenue, days at sea and trips, days at sea and boats, and boat gross revenue.

3.8.1.3 Landings, Ex-vessel Value, Price, and Effort

The landings of snapper grouper declined 28% from a high of 8.6 million pounds in 1997 to 6.1 million pounds in 2006, while effort declined by a third (Figures 3-1 to 3-3), The number of boats fell from a high of 1,301 in 1998 to a low of 857 in 2005. Days at sea fell 37% from 36,264 to 22,794 between 1997 and 2005, while trips fell 34% from 19,860 to 13,138 (in 2006).

Counting all of their trips, the boats typically landed a bit more of other species in terms of dollar value. The revenue from species other than snapper grouper rose between 1993 and 1999, peaking at $12.8 million (Figure 3-4). Total boat revenue peaked at $30.2 million in 1999 and averaged approximately the same in 2003-2007 as in 1993-1997 (2007 dollars).

The shallow water groupers and mid-shelf snappers are the largest species groups by volume and value within the snapper grouper fishery. Vermilion snapper in the mid-shelf snapper group is the largest volume species in the fishery and accounted for 15% of total landings and 18% of dockside revenue on average in 2003-2007 (totals, Table 3-3). Gag is the largest volume shallow-water grouper and accounted for 9% of total landings and 13% of dockside revenue.

Table 3-3. Annual landings and dockside (ex-vessel) revenues for trips with at least one pound of species in the snapper grouper fishery management unit, 2003-2007; landings in whole weight.

Item	2003	2004	2005	2006	2007	Average
Snapper grouper, 1,000 lbs	6,471	6,693	6,365	6,112	6,528	6,434
Snapper grouper, 1,000 2007 $	$13,762	$13,340	$13,078	$13,431	$15,426	$13,807
Price/lb (whole wt), current $	$1.89	$1.82	$1.93	$2.14	$2.36	$2.03
Price index for #2 diesel fuel	43	54	80	92	100	67
Other spp, same trips, 1,000 lbs	2,092	1,651	1,751	2,116	2,122	1,946
Other spp, same trips, 1,000 2007 $	$2,149	$2,001	$2,225	$2,394	$2,738	$2,301
Boat rev, all spp/trips, 1,000 2007 $	$21,967	$22,120	$22,377	$23,338	$24,232	$22,807

Source: NOAA Fisheries Service, Southeast Fisheries Science Center logbook database as of September 22, 2008, and Accumulated Landings System database as of September 17, 2008. NOAA Fisheries Service, Southeast Regional Office permits database. The BLS Consumer Price Index for all Urban Consumers was used to adjust dockside revenues and average annual prices for inflation. Data in last row computed separately, and results may differ if computed as for the previous rows. BLS Producer price index for #2 diesel fuel, index=100 for 2007.

The number of boats with snapper grouper permits exhibited a downward trend from 1,251 in 1999 to 877 in 2007, averaging 944 in 2003-2007 (Table 3-4). Two types of permits were created with the limited access program for the snapper grouper fishery that was implemented in 1998. The number of transferable permits that allow an unlimited harvest per trip was 938 in 1999 and 718 in 2007. The number of vessels with non-transferable permits with a 225-pound trip limit declined year-by-year from 313 in 1999 to 159 in 2007. The number of transferable permits declined, in part, because new entrants into the fishery must buy two permits and retire one as the condition for entry into the fishery. Furthermore, it is likely that the number of vessels in the snapper

grouper fishery declined for economic reasons. For example, fuel prices more than doubled between 2003 and 2007 and continued to increase through mid-2008. By contrast, average annual prices for species in the snapper grouper management unit were relatively flat.

Table 3-4. Fishing effort and distribution of landings for trips with at least one pound of species in the snapper grouper fishery management unit in the South Atlantic, 2003-2007.

Item	2003	2004	2005	2006	2007	Average
Number of trips	16,545	15,045	13,756	13,224	14,753	14,665
Days away from port	27,556	24,820	22,794	23,160	24,216	26,296
Boats landing snapper grouper	931	905	857	868	889	890
Number of permitted boats	1059	1001	909	874	877	944
Boats with transferable permits	828	782	721	697	718	749
Boats with non-transferable permits	231	219	188	177	159	195
	Number of boats according to landings of snapper grouper					
1-100 lbs per boat per year	140	156	138	164	155	151
101-1,000 lbs per boat per year	245	225	242	258	261	246
1,001-5,000 lbs per boat per year	270	263	239	228	225	245
5,001-10,000 lbs per boat per year	104	96	86	64	86	87
10,001-50,000 lbs per boat per year	152	133	123	127	134	134
More than 50,000 lbs per boat per year	20	32	29	27	28	27

Source: Same as first table, this section.

From 2003 through 2007, there were on average 890 boats and 14,665 trips per year on which at least one pound of snapper grouper species was landed (Table 3-4).[2] On average, 397 of the 890 boats landed at least 1,000 pounds of snapper grouper species annually; 245 boats landed 1,001 - 5,000 pounds; 87 boats landed 5,001 - 10,000 pounds; 134 boats landed 10,001 – 50,000 pounds; and 27 boats landed more than 50,000 pounds of snapper grouper species.

3.8.1.4 The South Atlantic Snapper Grouper Fishery by State

The following discussion provides annual averages for 2003-2007. To maintain the confidentiality of individual reporting units, summaries are provided for regions defined as North Carolina, South Carolina, Georgia and northeast Florida, and central-southeast Florida. Northeast Florida consists of trips landed in Nassau, Duval, and St. Johns Counties; the central-southeast Florida region consists of trips landed in Flagler through

[2] Fishermen with a permit to fish in Federal waters are required to submit a logbook report to the NMFS with information about landings, gear type, approximate location of trip, and date of landing. Trip revenue was calculated as landings multiplied by average prices from the NMFS Accumulated Landings System. The logbook database does not include landings from trips in state waters by fishermen who do not have Federal permits.

Miami-Dade Counties; and the Florida Keys region consists of trips from Atlantic waters landed in Monroe County.

Among the specified regions, snapper grouper landings and trips were not proportional (Table 3-5). For example, boats in central-southeast Florida made 32% of the trips and accounted for 12% of the total snapper grouper harvest. However, the disparity was less for trip revenue and days fished in this and other instances; that is, boats in central-southeast Florida had 19% of the trip revenue and 22% of the days fished. The differences have to do with the greater quantities of lower valued coastal pelagic species on trips in central-southeast Florida and other factors.

Table 3-5. Average annual landings and dockside revenues for trips with at least one pound of species in the snapper grouper fishery, averages for 2003-2007 by state; quantities in whole weight.

Item	North Carolina	South Carolina	Georgia-northeast Florida	Central-southeast Florida	Florida Keys	South Atlantic
Snapper grouper, 1,000 lbs	1,816	1,591	734	790	1,504	6,434
Percent of landings	28%	25%	11%	12%	23%	100%
Snapper grouper, 1,000 2007 $	$3,738	$3,795	$1,651	$1,615	$3,008	$13,807
Other spp, same trips, 1,000 lbs	286	125	54	1,293	188	1,946
Trip revenue, 1,000 2007 $	$4,127	$3,977	$1,774	$3,021	$3,210	$16,108
Percent of trip revenue	26%	25%	11%	19%	20%	100%
Number of boats*	175	64	46	342	294	921
Number of trips	2,607	916	486	4,691	5,964	14,665
Percent of trips	18%	6%	3%	32%	41%	100%
Number of days	4,727	4,702	1,946	5,473	7,661	24,509
Percent of days fished	19%	19%	8%	22%	31%	100%
Trips per boat	14.9	14.2	10.6	13.7	20.3	15.9
Days per trip	1.8	5.1	4.0	1.2	1.3	1.7

Source: Same as first table, this section. *Some boats land in more than one area.

Landings by various species groups is shown in Table 3-6.

Table 3-6. Average annual landings (in thousands of pounds, whole weight) on trips that landed at least one pound of snapper grouper species: averages for 2003-2007, by state and species group.

Species	North Carolina		South Carolina		Georgia-northeast Florida		Central-southeast Florida		Florida Keys		South Atlantic	
	lbs	%	lbs	%	lbs	%	lbs	%	lbs	%	lbs	%
Shallow-water groupers	504	24%	555	32%	152	19%	107	5%	100	6%	1418	17%
Deep-water groupers	84	4%	78	5%	5	1%	28	1%	59	3%	254	3%
Tilefish	78	4%	112	6%	1	0%	227	11%	12	1%	430	5%
Shallow-water snappers	10	0%	20	1%	21	3%	128	6%	887	52%	1065	13%
Mid-shelf snappers	375	18%	366	21%	347	44%	33	2%	15	1%	1136	14%
Triggerfish / Spadefish	131	6%	77	4%	56	7%	5	0%	2	0%	271	3%
Jacks	111	5%	159	9%	132	17%	240	12%	406	24%	1047	12%
Grunts / porgies	127	6%	92	5%	14	2%	16	1%	24	1%	274	3%
Sea basses	395	19%	133	8%	6	1%	6	0%	0	0%	540	6%
Snapper grouper	1816	86%	1591	93%	734	93%	790	38%	1504	89%	6434	77%
Coastal pelagic spp	216	10%	52	3%	34	4%	1016	49%	81	5%	1399	17%
Sharks	9	0%	19	1%	6	1%	195	9%	77	5%	306	4%
Tunas	22	1%	2	0%	1	0%	1	0%	0	0%	25	0%
Other species	39	2%	54	3%	13	2%	81	4%	30	2%	217	3%
All species	2102	100%	1717	100%	787	100%	2083	100%	1692	100%	8380	100%

Source: Same as first table, this section.

3.8.1.5 The Snapper Grouper Fishery by Gear

The following discussion provides annual averages from 2003 to 2007. To maintain the confidentiality of individual reporting units, summaries are provided for diving, vertical lines, longlines, black sea bass pots, and all other gears combined. The all-other-gear category includes trolling lines, nets, and other gears. Most of the snapper grouper harvest, including vermilion snapper and gag, is taken by some type of vertical hook-and-line gear. There are exceptions. Black sea bass are harvested primarily with black sea bass pots, while golden tilefish and yellowedge grouper are harvested primarily with bottom longlines. Some species, such as snowy grouper, are harvested by both vertical lines and longlines. Longlines used in the shark fishery may catch snapper grouper as a secondary species.

The average quantities of snapper grouper species harvested from 2003-2007 included 5.2 million pounds worth $11.3 million (in 2007 dollars) per year with vertical lines, 0.41 million pounds with longlines, 0.12 million pounds with black sea bass pots, 0.22 million pounds with dive gear, and 0.51 million pounds with other gear (Table 3-7). Vertical lines accounted for 78% of all trips that landed at least one pound of snapper grouper, 81% of the snapper grouper landed, 81% of days fished, and 76% of the trip revenue. Trips with longlines tend to be longer than trips with other gear.

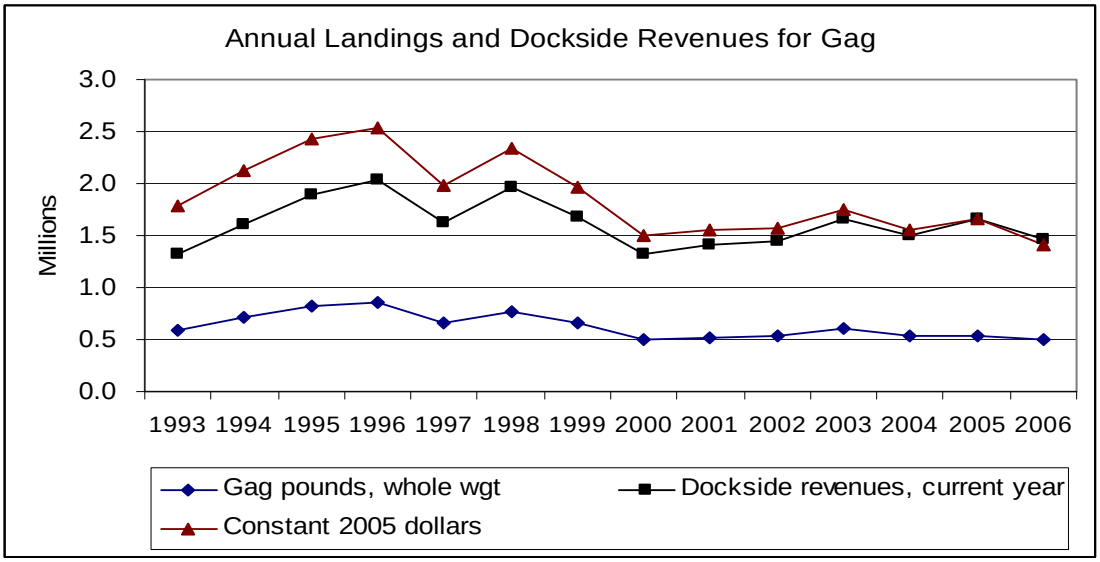
Table 3-7. Annual landings and dockside revenues for trips with at least one pound of species in the snapper grouper fishery by primary gear, 2003-2007; landings in whole weight.						
Item	Diving	Vertical Lines	Longline	Pots	Other gear	Total
Snapper grouper, 1,000 lbs	219	5,185	408	116	506	6,434
Percentage of landings	3%	81%	6%	2%	8%	100%
Snapper grouper, 1,000 2007$	$571	$11,314	$895	$168	$861	$13,807
Other spp, same trips, 1,000 lbs	49	674	265	941	17	1,946
Percentage of landings, other	3%	35%	14%	48%	1%	100%
Trip revenue, thousand 2007 $	$762	$12,272	$1,048	$1,148	$880	$16,108
Percentage of trip revenue	5%	76%	7%	7%	5%	100%
Number of boats*	65	723	27	50	245	1,110
Number of trips	648	11,405	246	690	1,676	14,665
Percent of trips	4%	78%	2%	5%	11%	100%
Number of days fished	920	19,910	924	944	1,811	24,509
Percent of days fished	4%	81%	4%	4%	7%	100%
Trips per boat	10.0	15.8	9.0	13.8	6.8	13.2
Days per trip	1.4	1.7	3.8	1.4	1.1	1.7
Source: Same as first table, this section.						

3.8.1.6 The Commercial Fishery for Gag

According to logbook data, commercial landings of gag ranged from a high of 0.85 million pounds (whole weight) worth approximately $2.03 million in 1996 to a low of 0.50 million pounds worth $1.6 million in 2006 (Figure 3-5). Dockside revenue and pounds landed fluctuate in the same direction, which suggests that ex-vessel demand is price elastic. The policy implication is that regulations that reduce industry landings in the short-term are expected to reduce dockside revenue in the short-term. Conversely, dockside revenue is expected to increase over time if regulation successfully increases biomass and landings.

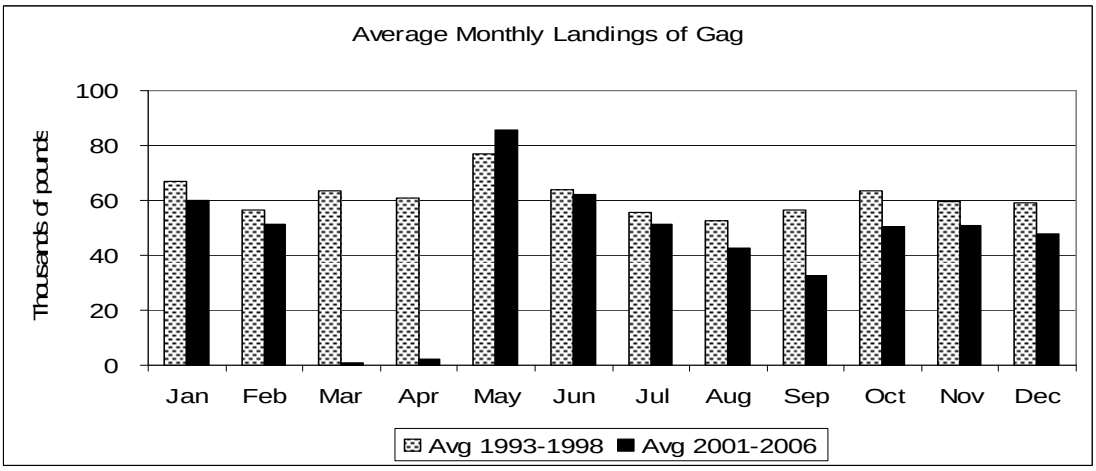
The time series for gag is defined by regulatory periods, with landings between 1993 and 1998 usually exceeding landings between 2001 and 2006. Between 1992 and 1998, the fishery for gag was regulated with a 20-inch minimum size limit. Beginning in 1999, the size limit was increased to 24 inches and the fishery was closed to commercial harvest in March and April to protect the spawning stock. Prior to 1999, average monthly landings were highest in May and lowest in August (Figure 3-6). After the commercial closure and larger size limit were implemented, average monthly landings increased in May, but otherwise declined in the remaining open months when compared to the 1993-1998 period, especially in September.

Figure 3-5. Annual landings and dockside revenue for gag, 1993-2006



Source: NOAA Fisheries Service, Southeast Fisheries Science Center logbook database as of October 10, 2007.
NOAA Fisheries Service, Southeast Fisheries Science Center Accumulated Landings System as of October 5, 2007.

Figure 3-6. Monthly average landings of gag, 1993-1998 and 2001-2006.



Source: NOAA Fisheries Service, Southeast Fisheries Science Center logbook database as of October 10, 2007.

On average over the period 2003-2007, 2,286 trips per year landed at least one pound of gag, and the landings came to 554,000 pounds with a value of $1.8 million in 2007 dollars (Table 3-8). On the same trips, the landings for all species came to 2.6 million pounds and the trip revenue came to $6.0 million. The ex-vessel value for all species and trips by the 292 boats that landed gag came to $10.2 million. The boats were not uniformly productive in the fishery for gag. Ninety-six of the 292 boats landed 100 pounds or less per year on average during 2003-2007, 160 boats landed 101 to 5,000 pounds, and 36 boats landed more than 5,000 pounds.

Table 3-8. Annual landings, dockside revenue and fishing effort, trips and boats with landings of at least one pound of gag, 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Average
Trips with at least one pound of gag	2,481	2,182	2,200	2,082	2,487	2,286
Gag, thousand pounds	598	532	541	496	605	554
Gag, thousand current $	$1,636	$1,521	$1,651	$1,617	$2,140	$1,713
Gag, thousand 2007 $	$1,844	$1,668	$1,751	$1,661	$2,136	$1,812
Dockside price, current $ / pound	$2.73	$2.86	$3.05	$3.26	$3.53	$3.09
All spp, same trips, thousand lbs	2,576	2,509	2,584	2,363	2,819	2,570
All spp, same trips, 1,000 2007 $	$5,898	$5,482	$5,845	$5,629	$7,154	$6,001
Boat rev, all spp/trips, 1,000 2007$	$9,923	$9,538	$10,357	$9,238	$12,137	$10,239
Number of boats that landed gag	302	292	302	259	305	292
	Number of boats according to landings of gag grouper					
1-100 lbs per boat per year	99	100	100	90	92	96
101-1,000 lbs per boat per year	89	92	103	74	100	92
1,001-5,000 lbs per boat per year	76	68	64	61	72	68
5,001-10,000 lbs per boat per year	25	19	22	21	30	23
More than 10,000 lbs per boat / year	13	13	13	13	11	13
Source: Same as first table, this section.						

Gag was the primary source of revenue on an average of 1,042 trips per year during 2003-2007, and a lesser source of revenue on 1,244 trips (Table 3-9 and Table 3-10). The trips on which gag was the primary source of revenue accounted for approximately 71% (391,000 pounds) of the total commercial harvest of gag and 470,000 pounds of other species (other groupers, snappers, jacks, grunts, porgies and non-snapper grouper species). On the 1,244 trips for which gag was a lesser source of revenue, landings of gag came to 164,000 pounds with an ex-vessel value of $527,000, compared with 1.5 million pounds for other species and an ex-vessel value of $3.2 million (Table 3-10). Along the Atlantic coast, more of the landings of gag occur in the Carolinas than farther south (Table 3-11). Approximately 81% of the gag is landed with vertical lines, and most of the remainder is landed with dive gear.

Table 3-9. Annual landings and dockside revenue on trips with gag as the top source of trip revenue, 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Average
Trips with at least one pound of gag	1,183	1,011	1,044	904	1,070	1,042
Boats	184	193	188	169	206	188
Gag, thousand pounds	415	385	372	341	440	391
Gag, thousand 2007 $	$1,282	$1,212	$1,213	$1,149	$1,567	$1,284
Other spp, same trips, 1,000 lbs	505	482	432	418	512	470
Other spp, same trips, 1,000 2007 $	$1,015	$935	$877	$861	$1,142	$966
Source: Same as first table, this section.						

Table 3-10. Annual landings and dockside revenue on trips with gag as a lesser source of trip revenue, 2003-2007, landings in whole weight.						
Item	2003	2004	2005	2006	2007	Average
Trips with at least one pound of gag	1,298	1,171	1,156	1,178	1,417	1,244
Boats	263	247	253	225	262	250
Gag, thousand pounds	184	147	169	155	166	164
Gag, thousand 2007 $	$562	$456	$538	$512	$569	$527
Other spp, same trips, 1,000 lbs	1,472	1,496	1,611	1,449	1,701	1,546
Other spp, same trips, 1,000 2007 $	$3,039	$2,878	$3,217	$3,107	$3,876	$3,224
Source: Same as first table, this section.						

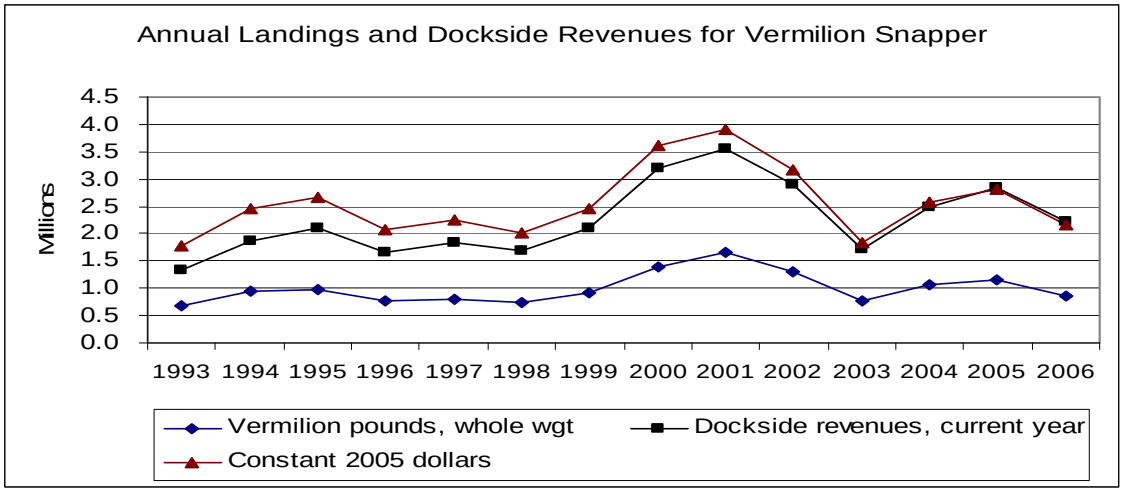
Table 3-11. Annual landings of gag for trips with at least one pound of gag, by region and primary gear, 2003-2007 (landings in thousand pounds, whole weight).						
Landing region or primary gear	2003	2004	2005	2006	2007	Average
North Carolina	141	143	175	154	141	151
South Carolina	234	233	216	204	241	226
Georgia and northeast Florida	100	88	90	71	117	93
Central and southeast Florida	120	66	58	66	101	82
Florida Keys	3	2	1	1	4	2
Vertical lines	455	450	467	410	462	447
Diving gear	131	76	67	81	133	98
Other gear	13	7	6	5	11	8
Source: NOAA Fisheries Service, Southeast Fisheries Science Center logbook database as of September 22, 2008.						

3.8.1.7 The Commercial Fishery for Vermilion Snapper

Logbook-reported commercial landings of vermilion snapper over the period 1993-2006 ranged from 0.68 million pounds ($1.33 million) in 1993 to 1.65 million pounds ($3.54 million) in 2001 (Figure 3-7). Landings of vermilion snapper began to increase in 1999 coincident with the implementation of more restrictive regulations for gag, peaked in 2001, and then declined through 2003 when unusually cold-water temperatures reduced the availability of fish in the summer and fall of 2003. Landings of vermilion snapper recovered in 2004 and 2005, but not to the levels of 2001 and 2002. Dockside revenue generally displayed the same trend over time as commercial landings, which suggests that ex-vessel demand for vermilion snapper is price elastic. Hence, regulations that reduce industry landings in the short-term are expected to reduce dockside revenue in the short-term. Conversely, dockside revenue is expected to increase over time if regulation successfully increases biomass and landings.

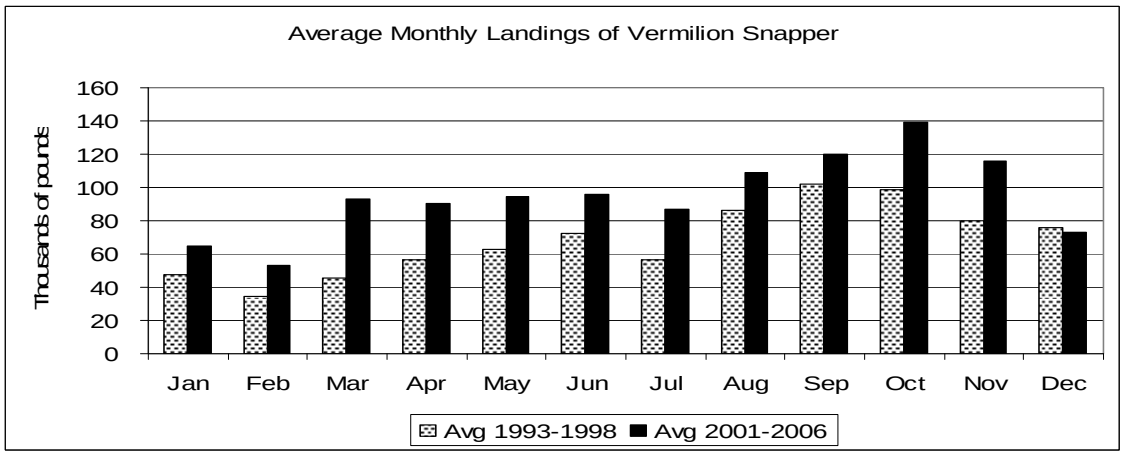
Vermilion snapper are landed throughout the year, with peak months from August through November (Figure 3-8). Average monthly landings were higher for all months except December during 2001-2006 compared with 1993-1998. The greatest relative monthly increases in average landings between the two periods occurred during March and April, which could reflect a shift in fishing effort from gag to vermilion in response to the closed season for gag that was implemented in 1999.

Figure 3-7. Annual landings and dockside revenue for vermilion snapper, 1993-2006.



Source: NOAA Fisheries Service, Southeast Fisheries Science Center logbook database (as of October 10, 2007), and Accumulated Landings System (as of October 5, 2007).

Figure 3-8. Monthly average landings, vermilion snapper, 1993-1998 & 2001-2006.



Source: NOAA Fisheries Service, Southeast Fisheries Science Center logbook database as of October 10, 2007.

Logbook-reported landings of vermilion snapper averaged 993,000 pounds from 2003-2007 and had an ex-vessel value of $2.5 million in 2007 dollars (Table 3-12). An average of 2,230 trips landed one or more pounds of vermilion snapper and landed 3.2 million pounds of all species worth $7.2 million (2007 dollars; Table 3-12).

Table 3-12. Annual landings, dockside revenues and fishing effort, trips and boats with landings of at least one pound of vermilion snapper, 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb vermilion snapper	2,171	2,147	2,170	2,107	2,554	2,230
Vermilion snapper, thousand pounds	769	1,071	1,152	865	1,108	993
Vermilion snapper, thousand current $	$1,866	$2,274	$2,552	$2,083	$3,078	$2,370
Vermilion snapper, thousand 2007 $	$2,100	$2,490	$2,704	$2,140	$3,070	$2,501
Dockside price, current $ / pound	$2.43	$2.12	$2.21	$2.41	$2.78	$2.39
All species, same trips, 1000 lbs	2,796	3,131	3,210	3,026	3,777	3,188
All species, same trips, 1,000 2007 $	$6,377	$6,629	$7,012	$6,889	$9,086	$7,199
Boat rev, all spp/trips, 1,000 2007 $	$9,517	$9,383	$9,550	$10,124	$12,741	$10,263
Boats that landed vermilion snapper	248	255	252	233	275	253
	Number of boats according to landings of vermilion snapper					
1-100 lbs per boat per year	91	95	99	89	111	97
101-1,000 lbs per boat per year	66	75	59	63	70	67
1,001-5,000 lbs per boat per year	38	28	38	35	37	35
5,001-10,000 lbs per boat per year	26	13	18	12	18	17
More than 10,000 lbs per boat / year	27	44	38	34	39	36
Source: Same as first table, this section.						

Revenue for the 253 boats that landed at least one pound of vermilion snapper came to $10.2 million for all species and all trips including trips by these boats that did not land vermilion snapper. The boats were not uniformly productive in the fishery for vermilion snapper. Ninety-seven of the 253 boats landed 100 pounds or less, 164 boats landed 1,000 pounds or less, 52 landed 1,001 to 10,000 pounds, and 36 boats landed more than 10,000 pounds (Table 3-12).

Table 3-13. Annual landings and dockside revenues on trips with vermilion snapper as the top source of trip revenue, 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb vermilion snapper	956	1024	1059	809	1063	982
Boats	152	159	156	135	147	150
Vermilion snapper, thousand pounds	630	911	992	687	901	824
Vermilion snapper, thousand 2007 $	1716	2126	2329	1717	2496	$2077
Other species, same trips, thousand pounds	722	834	963	733	997	850
Other species, same trips, thousand 2007 $	1323	1391	1754	1348	1842	$1532
Source: Same as first table, this section.						

Vermilion snapper was the primary source of revenue on 982 trips per year on average from 2003-2007 (Table 3-13). These trips accounted for 83% of the landings and ex-vessel value for vermilion snapper; 824,000 pounds at $2.1 million (Table 3-13). On these trips, other species accounted for 850,000 pounds and $1.5 million in revenue (groupers, jacks, grunts, porgies, and non-snapper grouper species).

Vermilion snapper were caught as a lesser source of revenue on 1,248 trips for gag, scamp, and red grouper in the shallow-water grouper fishery and snowy grouper in the

deep-water grouper fishery (Table 3-14). These trips accounted for an annual average of 169,000 pounds of vermilion snapper ($424,000 in 2007 dollars) and 1.3 million pounds ($3.2 million) of other species. Vermilion snapper is landed mostly in the Carolinas through Georgia and northeast Florida and vertical lines are the leading gear (Table 3-15).

Table 3-14. Annual landings and dockside revenues on trips with vermilion snapper as a lesser source of trip revenue, 2003-2007 (landings in whole weight).

Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb vermilion snapper	1,215	1,123	1,111	1,298	1,491	1,248
Boats	220	221	213	203	255	222
Vermilion snapper, thousand pounds	140	160	160	178	207	169
Vermilion snapper, thousand 2007 $	$385	$364	$376	$423	$574	$424
Other species, same trips, 1,000 lbs	1,304	1,225	1,095	1,428	1,672	1,345
Other spp, same trips, 1,000 2007 $	$2,955	$2,748	$2,554	$3,401	$4,175	$3,166

Source: Same as first table, this section.

Table 3-15. Annual landings of vermilion snapper for trips with at least one pound of vermilion snapper, by region and primary gear, 2003-2007(landings in whole weight).

Landing region or primary gear	2003	2004	2005	2006	2007	Average
North Carolina	238	311	422	320	522	363
South Carolina	286	414	424	259	264	329
Georgia and northeast Florida	225	331	291	277	312	287
Central and southeast Florida	11	7	10	4	8	8
Florida Keys	9	8	5	5	1	6
Vertical lines	764	1,066	1,145	859	1,098	986
Diving gear	2	2	4	4	5	3
Other gear	4	3	3	2	4	3

Source: Same as first table, this section.

3.8.1.8 The Commercial Fishery for Black Grouper

According to the NMFS logbook database, black grouper were landed on an average 1,622 trips per year over the period 2003-2007, with landings amounting to 182,000 pounds worth $528,000 in 2007 dollars (Table 3-16). Landings of other species on these trips came to 873,000 pounds, and brought trip revenue to $2.3 million. Black grouper was landed by an average of 323 boats from 2003-2007, with 288 of them landing 1,000 pounds or less per year and 8 of them landing more than 5,000 pounds. For these boats, black grouper accounted for 6.5% of the $8.2 million of the ex-vessel value for all logbook-reported landings of all species on all trips, including trips by these boats that did not land black grouper (Table 3-16).

Table 3-16. Annual landings, dockside revenue and fishing effort, trips and boats with landings of at least one pound of black grouper 2003-2007 (landings in whole weight).

Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb black grouper	1,743	1,905	1,726	1,331	1,405	1,622
Black grouper, thousand pounds	158	205	196	170	180	182
Black grouper, thousand current $	$386	$518	$521	$495	$575	$499
Black grouper, thousand 2007 $	$436	$569	$552	$510	$575	$528
Dockside price, current $ / pound	$2.45	$2.52	$2.66	$2.92	$3.19	$2.75
All sp, same trips, 1,000 lbs	921	1,150	1,145	981	1,079	1,055
All sp, same trips, 1,000 2007 $	$1,934	$2,379	$2,445	$2,241	$2,607	$2,321
Boat rev, all sp/trips, 1,000 2007 $	$8,779	$8,604	$7,339	$7,396	$8,693	$8,162
Boats landing landed black grouper	372	363	309	289	281	323
	Number of boats according to landings of black grouper					
1-100 lbs per boat per year	171	152	139	157	138	151
101-1,000 lbs per boat per year	164	172	138	101	110	137
1,001-5,000 lbs per boat per year	34	28	23	23	25	27
More than 5,000 lbs per boat per year	3	11	9	8	8	8

Source: Same as first table, this section.

Black grouper was the top source of revenue for an average of 649 trips per year from 2003-2007, and a lesser source on 973 trips (Table 3-17 and Table 3-18). On the 649 trips for which it was the top source of revenue, black grouper accounted for 115,000 pounds of landings worth $334,000 in 2007 dollars, and other species accounted for 122,000 pounds. These 649 trips accounted for 67% of the total ex-vessel value of black grouper. For the 973 trips for which it was a lesser source of revenue, landings of black grouper came to 67,000 pounds, compared with 751,000 pounds for other species. During 2003-2007, black grouper was landed for the most part in Florida. Vertical lines were the leading gear (Table 3-19).

Table 3-17. Annual landings and dockside revenues on trips with black grouper as the top source of trip revenue, 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Ave
Trips with at least 1 lb black grouper	691	802	686	510	554	649
Boats	206	203	169	149	151	176
Black grouper, 1,000 pounds	106	137	113	108	111	115
Black grouper, 1,000 2007 $	$292	$380	$319	$325	$356	$334
Other spp, same trips, 1,000 lbs	107	149	86	123	147	122
Other spp, same trips, 1,000 2007 $	$188	$262	$154	$243	$315	$232
Source: Same as first table, this section.						

Table 3-18. Annual landings and dockside revenues on trips with black grouper as a lesser source of trip revenue, 2003-2007(landings in whole weight).						
Item	2003	2004	2005	2006	2007	Ave
Trips with at least 1 lb black grouper	1,052	1,103	1,040	821	851	973
Boats	309	294	263	242	232	268
Black grouper, 1,000 pounds	52	69	83	62	69	67
Black grouper, 1,000 2007 $	$144	$189	$233	$185	$219	$194
Other spp, same trips, 1,000 lbs	656	795	864	688	752	751
Other spp, same trips, 1,000 2007$	$1,310	$1,548	$1,740	$1,488	$1,717	$1,561
Source: Same as first table, this section.						

Table 3-19. Annual landings of black grouper for trips with at least one pound of black grouper, by primary gear, 2003-2007 (landings in thousand pounds, whole weight).						
Primary gear	2003	2004	2005	2006	2007	Average
Vertical lines	121	172	168	156	159	155
Diving gear	24	21	24	12	18	20
Other gear	12	11	4	1	3	6
Source: Same as first table, this section.						

3.8.1.9 The Commercial Fishery for Black Sea Bass

According to logbook data, black sea bass were landed on an average 2,157 trips per year in 2003-2007, with landings of 540,000 pounds worth $937,000 in 2007 dollars; (Table 3-20). Landings of other species on the same trips, 4.0 million pounds, brought trip revenue to $4.5 million in 2007 dollars. Black sea bass were landed by an average of 237 boats from 2003-2007, with 181 of them landing 1,000 pounds or less per year and 23 of them landing more than 5,000 pounds. For these boats, black sea bass accounted for 9.8% of the $906 million of the ex-vessel value for all logbook-reported landing of all species on all trips, including trips by these boats that did not land black sea bass.

Table 3-20. Annual landings, dockside revenues and fishing effort, trips and boats with landings of at least one pound of black sea bass 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb black sea bass	2,238	2,372	2,056	2,172	1,949	2,157
Black sea bass, thousand pounds	597	707	460	527	409	540
Black sea bass, thousand current $	$916	$842	$571	$988	$1,089	$881
Black sea bass, thousand 2007 $	$1,033	$927	$611	$1,020	$1,097	$937
Dockside price, current $ / pound	$1.53	$1.19	$1.24	$1.87	$2.66	$1.63
All species, same trips, 1,000 lbs	4,189	4,616	4,441	4,508	4,805	4,512
All species, same trips, 1,000 2007 $	$4,411	$4,643	$4,358	$4,549	$4,594	$4,511
Boat rev, all spp/trips, 1,0000 2007 $	$8,835	$8,961	$9,116	$9,569	$11,441	$9,584
Boats that landed black sea bass	225	243	240	220	256	237
	Number of boats according to landings of black sea bass					
1-100 lbs per boat per year	84	86	104	87	134	99
101-1,000 lbs per boat per year	85	93	81	81	72	82
1,001-5,000 lbs per boat per year	35	34	36	31	27	33
5,001-10,000 lbs per boat per year	7	12	7	6	11	9
More than 10,000 lbs per boat / year	14	18	12	15	12	14
Source: Same as first table, this section.						

Black sea bass was the top source of revenue for 765 trips on average from 2003-2007, and a lesser source on 1,392 trips (Table 3-21 and Table 3-22). On the 765 trips for which it was the top source of revenue, black sea bass accounted for 489,000 pounds of landings worth $855,000 in 2007 dollars, and other species accounted for 54,000 pounds worth $68,000 in 2007 dollars. These 765 trips accounted for 35% of all trips that landed at least one pound of black sea bass, 91% of total landings of black sea bass, and 97% of total ex-vessel value for black sea bass.

Table 3-21. Annual landings and dockside revenues on trips with black sea bass as the top source of trip revenue, 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb black sea bass	858	889	620	811	649	765
Boats	86	94	83	85	88	87
Black sea bass, thousand pounds	546	637	403	482	378	489
Black sea bass, thousand 2007 $	$948	$827	$539	$936	$1,023	$855
Other species, same trips, 1,000 lbs	51	57	38	69	57	54
Other species, same trips, 1,000 2007 $	$62	$66	$43	$94	$76	$68
Source: Same as first table, this section.						

Table 3-22. Annual landings and dockside revenues on trips with black sea bass as a lesser source of trip revenue, 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb black sea bass	1,380	1,483	1,436	1,361	1,300	1,392
Boats	195	217	216	194	233	211
Black sea bass, thousand pounds	51	70	57	45	31	51
Black sea bass, thousand 2007 $	$85	$99	$73	$84	$74	$83
Other species, same trips, 1,000 lbs	1,446	1,721	1,674	1,498	1,408	1,549
Other species, same trips, 1,000 2007 $	$3,316	$3,651	$3,704	$3,436	$3,422	$3,506
Source: Same as first table, this section.						

For the 1,392 trips for which it was a lesser source of revenue, landings of black sea bass came to 51,000 pounds worth $83,000 in 2007 dollars, compared with 1.5 million pounds for other species worth $3.5 million). Among South Atlantic states, black sea bass is landed primarily in North Carolina and South Carolina (Table 3-23). The species is landed mostly with black sea bass pots and vertical lines are a distant second.

Table 3-23. Annual landings of black sea bass for trips with at least one pound of black sea bass, by region and primary gear, 2003-2007, landings in thousand pounds whole weight.						
Landing region or primary gear	2003	2004	2005	2006	2007	Average
North Carolina	476	485	324	421	271	395
South Carolina	112	210	120	94	128	133
Georgia and northeast Florida	4	7	8	6	5	6
Central and southeast Florida	4	5	9	7	4	6
Florida Keys			0		0	0
Vertical lines	70	85	63	58	44	64
Pots	521	617	390	466	362	471
Diving gear	0	1	0	0	0	0
Other gear	6	5	6	3	2	4
Source: Same as first table, this section.						

3.8.1.10 The Commercial Fishery for Red Grouper

According to the logbook database, red grouper were landed on an average of 2,725 trips per year from 2003-2007, with landings amounting to 319,000 pounds and an ex-value of $787,000 in 2007 dollars (Table 3-24). Landings of other species on these trips came to 2.7 million pounds, and brought trip revenue to $6.9 million. Red grouper were landed by an average of 402 boats per year; 329 of them landed 1,000 pounds or less per year and 17 of them landed more than 5,000 pounds. The landings of red grouper accounted for 6.4% of the $12.3 million of the ex-vessel value for all logbook-reported landings of all species on all trips by these 402 boats, including trips that did not land red grouper.

Table 3-24. Annual landings, dockside revenue and fishing effort, trips and boats with landings of at least one pound of red grouper, 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb red grouper	2,840	2,670	2,558	2,522	3,035	2,725
Red grouper, thousand pounds	282	245	202	316	551	319
Red grouper, thousand current $	$614	$493	$444	$773	$1,440	$753
Red grouper, thousand 2007 $	$692	$542	$471	$793	$1,436	$787
Dockside price, current $ / pound	$2.18	$2.01	$2.20	$2.45	$2.62	$2.36
All species, same trips, 1,000 lbs	2,806	2,810	2,862	3,012	3,707	3,039
All species, same trips, 1,000 2007 $	$6,132	$5,994	$6,333	$6,922	$9,121	$6,900
Boat rev, all spp/trips, 1,000 2007$	$12,307	$11,646	$11,709	$11,351	$14,284	$12,259
Boats that landed red grouper	461	420	389	347	391	402
	Number of boats according to landings of red grouper					
1-100 lbs per boat per year	232	217	197	183	182	202
101-1,000 lbs per boat per year	158	137	134	94	114	127
1,001-5,000 lbs per boat per year	59	56	53	51	56	55
5,001-10,000 lbs per boat per year	9	9	5	16	23	12
More than 10,000 lbs per boat / year	3	1	0	3	16	5
Source: Same as first table, this section.						

Red grouper was the top source of revenue for 486 trips on average over the period 2003-2007, and a lesser source on 2,239 trips (Table 3-25 and Table 3-26). On the 486 trips for which it was the top source of revenue, red grouper accounted for 136,000 pounds of landings (ex-vessel value of $337,000 in 2007 dollars), and other species accounted for 142,000 pounds. These 486 trips accounted for 43% of the totals for the landings and ex-vessel value for red grouper (Table 3-24). For the 2,239 trips for which it was a lesser source of revenue, landings of red grouper came to 183,000 pounds, compared with 2.6 million pounds for other species (Table 3-26).

Table 3-25. Annual landings and dockside revenues on trips with red grouper as the top source of trip revenue, 2003-2007.						
Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb red grouper	476	388	304	430	830	486
Boats	175	143	117	119	157	142
Red grouper, thousand pounds	105	88	49	128	308	136
Red grouper, thousand 2007 $	$256	$191	$115	$322	$803	$337
Other species, same trips, 1,000 lbs	110	109	55	162	275	142
Other sp, same trips, 1,000 2007 $	$247	$221	$109	$343	$637	$311
Source: Same as first table, this section.						

Table 3-26. Annual landings and dockside revenues on trips with red grouper as a lesser source of trip revenue, 2003-2007.						
Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb of red grouper	2,364	2,282	2,254	2,092	2,205	2,239
Boats	431	399	368	326	365	378
Red grouper, thousand pounds	176	158	153	188	243	183
Red grouper, thousand 2007 $	$436	$350	$356	$471	$633	$449
Other species, same trips, 1,000 lbs	2,415	2,455	2,605	2,534	2,881	2,578
Other sp, same trips, 1,000 2007 $	$5,193	$5,232	$5,753	$5,786	$7,048	$5,803
Source: Same as first table, this section.						

Red grouper are landed primarily in North Carolina and by vertical gear (Table 3-27).

Table 3-27. Annual landings of red grouper for trips with at least one pound of red grouper, by region and primary gear, 2003-2007 (landings in thousand pounds, whole weight).						
Landing region or primary gear	2003	2004	2005	2006	2007	Average
North Carolina	171	139	120	202	374	201
South Carolina	52	49	41	85	142	74
Georgia and northeast Florida	11	9	9	7	9	9
Central and southeast Florida	10	8	7	7	9	8
Florida Keys	38	41	26	15	16	27
Vertical lines	268	223	191	309	540	306
Diving gear	7	7	7	4	8	7
Other gear	6	15	3	3	3	6
Source: Same as first table, this section.						

3.8.1.11 The Commercial Fisheries for Speckled Hind and Warsaw Grouper

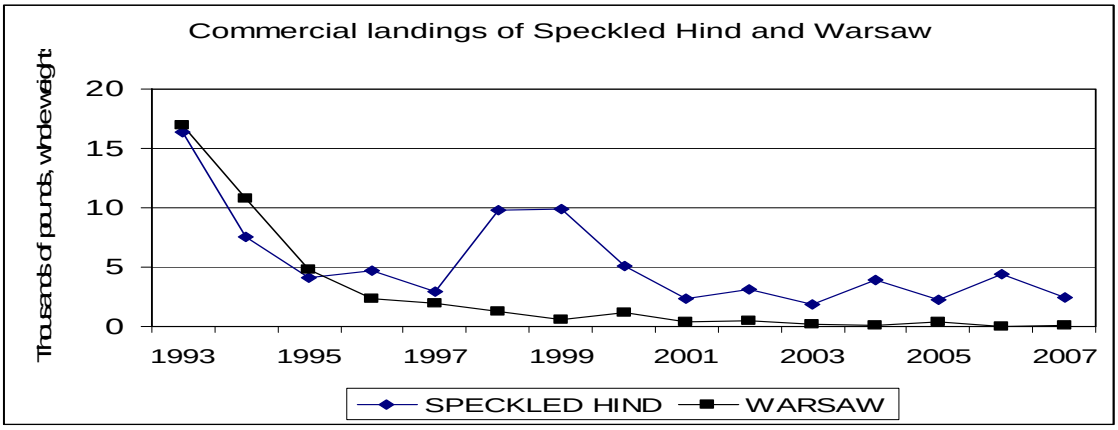
There are no directed commercial fisheries for speckled hind and warsaw grouper. In 1993, commercial fishermen landed 16,300 pounds of speckled hind worth $28,600, and 17,000 pounds of warsaw grouper worth $23,800. Landings of both species have declined since then (Figure 3-9), as Amendment 6 to the Snapper Grouper FMP prohibited their sale in mid-1994. There is a one-fish possession limit for each species for home consumption since these deep-water groupers probably would not survive if released after being caught. Although fishermen are instructed not to report fish landed for personal use, small quantities of both species were reported in logbooks. It is unclear if these quantities were for personal use or were sold. On average from 2003-2007, 3,000 pounds of speckled hind were landed per year by 32 boats (Table 3-28). Speckled hind was not the top revenue species on 73 of the 74 trips on which it was harvested.

The average 74 recorded trips per year that harvested speckled hind brought in $200,000 for the 90,000 pounds of all species landed, while the average 32 boats per year that harvested speckled hind brought in $1.6 million for all logbook-reported trips/species landed (Table 3-28 and Table 3-29). Speckled hind are caught most commonly in the

Carolinas and Florida Keys with vertical hook-and-line gear on trips for vermilion snapper, red grouper and scamp.

Warsaw grouper was reported on only nine trips between 2003 and 2007.

Figure 3-9 Commercial landings of speckled hind and warsaw Grouper, 1993-2007



Source: NOAA Fisheries Service, Southeast Fisheries Science Center logbook database as of September 22, 2008.

Table 3-28. Annual landings, dockside revenues and fishing effort, trips and boats with landings of at least one pound of speckled hind, 2003-2007 (landings in whole weight).

Item	2003	2004	2005	2006	2007	Ave
Trips with at least one lb of speckled hind	77	65	70	77	79	74
Speckled hind, thousand pounds	1.9	3.9	2.2	4.4	2.5	3.0
Speckled hind, thousand current $	$3.3	$7.1	$4.2	$9.9	$6.1	$6.1
Speckled hind, thousand 2007 $	$3.7	$7.7	$4.5	$10.1	$6.1	$6.4
Price, current $ / pound	$1.74	$1.82	$1.91	$2.25	$2.44	$2.05
All species, same trips, 1,000 lbs	82	64	103	116	87	90
All species, same trips, 2007 $	$177	$135	$218	$263	$206	$200
Boat rev, all spp/trips, 1,000 2007 $	$1,540	$1,335	$1,894	$1,812	$1,433	$1,603
Boats that landed speckled hind	33	33	34	31	27	32
	Number of boats according to landings of speckled hind					
1-100 lbs per boat per year	26	28	30	26	22	26
More than 100 lbs per boat per year	7	5	4	5	5	5

Source: Same as first table, this section.

Table 3-29. Annual landings and dockside revenue on trips with trips on which speckled hind was harvested but was not the top revenue species, 2003-2007 (landings in whole weight).

Item	2003	2004	2005	2006	2007	Average
Trips	77	64	70	77	79	73
Boats	33	32	34	31	27	31
Speckled hind, thousand pounds	1.9	3.9	2.2	4.4	2.5	3.0
Speckled hind, thousand 2007$	$3.7	$7.6	$4.5	$10.1	$6.1	$6.4
Other species, same trips, 1,000 lbs	80	60	101	111	84	87
Other species, same trips, 1,000 2007$	$173	$127	$214	$253	$200	$194

Source: Same as first table, this section.

3.8.1.12 The Commercial Fishery for Golden Tilefish

Golden tilefish were landed on an average of 402 trips per year during 2003-2007, with average annual landings of 330,000 pounds valued at $721,000 in2007 dollars(Table 3-30). Adding the landings and revenues of other species on these trips (227,000 pounds and $384,000), these trips had an annual average ex-vessel value of $1.1 million. On average 64 boats landed at least one pound of golden tilefish during 2003-2007, and the ex-vessel value of all of their logbook-reported landings for all species and trips was approximately $2.6 million (2007 dollars). Forty of the 64 boats landed 1,000 pounds or less of golden tilefish per year and 11 landed more than 5,000 pounds.

Golden tilefish was the top source of revenue for 283 trips on average per year during 2003-2007 (Table 3-31), and was not the top source of revenue on an average of 119 trips per year (Table 3-32). On the 283 trips for which it was the top source of revenue, golden tilefish accounted for an average of 303,000 pounds valued at $667,000 (2007 dollars), while all other species accounted for 73,000 pounds valued at $106,000. For the 119 trips where golden tilefish was not the top revenue species, landings of golden tilefish averaged 27,000 pounds per year, compared to 153,000 pounds for all other species. Golden tilefish were landed primarily in central-southeast Florida and harvested primarily with longline gear (Table 3-33).

Table 3-30. Annual landings, dockside revenues and fishing effort, trips and boats with landings of at least one pound of golden tilefish, 2003-2007 (landings in whole weight).

Item	2003	2004	2005	2006	2007	Average
Trips with at least one lb golden tilefish	391	336	359	331	593	402
Golden tilefish, thousand pounds	344	272	307	410	320	330
Golden tilefish, thousand current $	$658	$511	$664	$827	$748	$682
Golden tilefish, thousand 2007 $	$741	$561	$702	$849	$753	$721
Dockside price, current $ / pound	$1.92	$1.88	$2.17	$2.02	$2.34	$2.06
All spp, same trips, 1,000 lbs	686	504	497	691	408	557
All spp, same trips, 1,000 2007 $	$1,287	$930	$1,068	$1,336	$905	$1,105
Boat rev, all spp/trips, 1,000 2007$	$2,668	$2,264	$2,627	$2,801	$2,578	$2,588
Boats that landed golden tilefish	63	65	65	60	65	64
	Number of boats according to landings of golden tilefish					
1-100 lbs per boat per year	23	20	16	25	18	20
101-1,000 lbs per boat per year	21	21	25	16	19	20
1,001-5,000 lbs per boat per year	3	13	16	9	18	12
More than 5,000 lbs per boat / year	15	11	8	10	10	11

Source: Same as first table, this section.

Table 3-31. Annual landings and dockside revenues on trips on which golden tilefish was harvested but was not the top revenue species, 2003-2007.						
Item	2003	2004	2005	2006	2007	Ave
Trips with at least one lb golden tilefish	240	233	247	216	481	283
Boats	40	43	45	33	47	42
Golden tilefish, 1,000 lbs	307	243	276	378	312	303
Golden tilefish, 1,000 2007 $	$671	$505	$639	$786	$735	$667
Other spp, same trips, 1,000 lbs	140	81	40	78	27	73
Other spp, same trips, 1,000 2007$	$188	$116	$64	$123	$40	$106
Source: Same as first table, this section.						

Table 3-32. Annual landings and dockside revenues on trips with golden tilefish as a lesser source of trip revenue, 2003-2007.						
Item	2003	2004	2005	2006	2007	Ave
Trips with at least one lb golden tilefish	151	103	112	115	112	119
Boats	50	45	46	45	39	45
Golden tilefish, 1,000 lbs	36	30	30	32	7	27
Golden tilefish, 1,000 2007 $	$70	$56	$63	$63	$18	$54
Other spp, same trips, 1,000 lbs	203	150	150	203	61	153
Other spp, same trips, 1,000 2007 $	$357	$253	$301	$365	$112	$278
Source: Same as first table, this section.						

Table 3-33. Annual landings of golden tilefish for trips with at least one pound of golden tilefish, by region and primary gear, 2003-2007.						
Region of landing or primary gear	2003	2004	2005	2006	2007	Average
North Carolina	17	40	1	2	2	12
South Carolina	128	105	62	122	27	89
Georgia & northeast Florida			0		0	0
Central-southeast Florida	191	126	240	283	289	226
Florida Keys	8	1	4	2	1	3
Vertical lines	18	25	38	35	44	32
Long lines	325	248	267	372	275	297
Other	0	0	2	2	1	1
Source: Same as first table, this section..						

3.8.1.13 The Commercial Fishery for Snowy Grouper

Snowy grouper were landed on an average of 1,057 trips per year during 2003-2007, with total average annual landings of 230,000 pounds valued at $619,000 in 2007 dollars (Table 3-34). Average annual landings of all other species on these trips came to 1.2 million pounds valued at $2.3 million. Snowy grouper accounted for 7.3% of the $8.4 million for logbook-reported landings of all species on all trips (including trips that did not land snowy grouper) by boats that harvested snowy grouper (Table 3-34). Snowy grouper were landed by an average of 160 boats during 2003-2007, and 117 of them landed 1,000 pounds or less per year while 13 landed more than 5,000 pounds per year.

On average there were 387 trips per year where snow grouper was the top source of revenue. Snowy grouper accounted for 170,000 pounds valued at $455,000 (2007 dollars), while all other species accounted for 149,000 pounds valued at $234,000 (Table 3-35). These 387 trips accounted for 37% of the total number of trips with snowy grouper landings and 74% of the snowy grouper landings and ex-vessel value. There were an average of 607 trips on which snowy grouper was harvested but was not the top revenue species; total average annual landings of snowy grouper was approximately 61,000 pounds, compared with 1.0 million pounds worth $2.1 million for all other species (Table 3-36). During 2003-2007, snowy grouper was landed mostly in the Carolinas and the Florida Keys (Table 3-37).

Table 3-34. Annual landings, dockside revenues and fishing effort, trips and boats with landings of at least one pound of snowy grouper, 2003-2007 (landings in whole weight).

Item	2003	2004	2005	2006	2007	Average
Trips with at least 1 lb snowy grouper	1,342	1,060	979	820	1,084	1,057
Snowy grouper, thousand pounds	284	240	248	258	123	230
snowy grouper, thousand current $	$642	$577	$605	$703	$373	$580
Snowy grouper, thousand 2007 $	$723	$634	$643	$721	$373	$619
Dockside price, current $ / pound	$2.26	$2.41	$2.44	$2.73	$3.03	$2.52
All species, same trips, 1,000 lbs	1,683	1,398	1,348	1,324	1,216	1,394
All species, same trips, 1,000 2007 $	$3,209	$2,820	$2,837	$2,857	$2,894	$2,923
Boat revenue, all spp/trips, 1,000 2007 $	$8,399	$8,359	$8,575	7903	$8,841	$8,415
Boats that landed snowy grouper	189	167	163	132	147	160
	Boats according to landings of snowy grouper					
1-100 lbs per boat per year	61	52	54	39	58	53
101-1,000 lbs per boat per year	70	67	70	50	62	64
1,001-5,000 lbs per boat per year	44	30	26	28	23	30
5,001-10,000 lbs per boat per year	7	13	8	5	2	7
More than 10,000 lbs per boat per year	7	5	5	10	2	6

Source: Same as first table, this section.

Table 3-35. Annual landings and dockside revenues on trips with snowy grouper as the top source of trip revenue, 2003-2007 (landings in whole weight).						
Item	2003	2004	2005	2006	2007	Ave
Trips with at least 1 lb snowy grouper	540	441	438	366	149	387
Boats	108	95	86	69	59	83
Snowy grouper, 1,000 pounds	201	178	192	202	74	170
Snowy grouper, 1,000 2007 $	$511	$471	$501	$566	$226	$455
Other spp, same trips, 1,000 lbs	190	150	164	182	57	149
Other spp, same trips, 1,000 2007$	$292	$238	$273	$281	$89	$234
Source: Same as first table, this section.						

Table 3-36. Annual landings and dockside revenues on trips with snowy grouper as a lesser source of trip revenue, 2003-2007(landings in whole weight).						
Item	2003	2004	2005	2006	2007	Ave
Trips with at least 1 lb snowy grouper	802	619	541	454	621	607
Boats	168	141	137	112	135	139
Snowy grouper, 1,000 pounds	83	62	55	56	49	61
Snowy grouper, 1,000 2007 $	$211	$164	$142	$155	$147	$164
Other spp, same trips, 1,000 lbs	1,210	1,008	936	885	1,036	1,015
Other spp, same trips, 1,000 2007$	$2,194	$1,948	$1,920	$1,855	$2,433	$2,070
Source: Same as first table, this section.						

Table 3-37. Annual landings of snowy grouper for trips with at least one pound of snowy grouper, by region and primary gear, 2003-2007 (landings in thousand pounds, whole weight).						
Landing region or primary gear	2003	2004	2005	2006	2007	Average
North Carolina	95	90	81	91	47	81
South Carolina	94	65	86	95	13	71
Georgia and northeast Florida	9	6	4	3	3	5
Central and southeast Florida	36	28	25	15	15	24
Florida Keys	50	51	52	54	46	51
Vertical lines	197	176	185	188	117	173
Other gear	87	64	62	69	6	58
Source: Same as first table, this section.						

3.8.1.14 Imports

Imports have been a major source of seafood supply in the United States, and the domestic snapper grouper market is not an exception. During 2003-2007, imports of fresh and frozen snappers and groupers remained at relatively high levels, averaging 48 million pounds a year (Table 3-38). By way of comparison, the average logbook-reported landings of snapper grouper caught in South Atlantic waters were 7.8 million pounds whole weight. The dominance of imports in the snapper grouper market may be expected to exert limits on the movement of domestic ex-vessel prices resulting from changes in domestic landings of snappers and groupers.

Table 3-38. U.S. imports of snapper and grouper (product weight).						
	Fresh snapper & grouper		Frozen snapper & grouper		Total	
Year	Million pounds	Million 2007$	Million pounds	Million 2007$	Million pounds	Million 2007$
2003	34	66	10	16	44	82
2004	33	68	10	15	43	83
2005	36	76	14	22	50	99
2006	35	81	13	24	49	104
2007	38	87	14	26	52	113
Ave	35	76	12	21	48	96
Source: NOAA Fisheries, Foreign trade data base; see footnote, first table in this section.						

3.8.2 Economic Description of the Recreational Fishery

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

The South Atlantic recreational fishery 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 party boat) 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. The type of service, from a vessel- or passenger-size perspective, affects the flexibility to search different fishing locations during the course of a trip and target different species since larger concentrations of fish are required to satisfy larger groups of anglers.

3.8.2.1 Harvest

Recreational snapper grouper harvest in the South Atlantic has been variable during the period 2003-2008, averaging slightly more than 11 million pounds (Table 3-39). On average, the private/shore mode of fishing accounted for the largest harvests at around 7.62 million pounds (MP). Well below this harvest level are those of the charter mode at 1.92 MP and headboat at 1.63 MP. Harvests in each state also fluctuated during the same period (Table 3-40). On average, Florida accounted for most of the snapper grouper harvest in the South Atlantic at around 6.90 MP, followed by North Carolina at 2.21 MP, South Carolina at 1.51 MP, and Georgia at 0.619 MP.

Table 3-39. Harvest of snapper grouper species by mode in the South Atlantic, 2003-2008.

Year	Charterboat[1]	Headboat[2]	Shore and Private/Rental Boat[1]	Total
2003	2,301,303	1,375,688	7,265,886	10,942,877
2004	1,517,384	1,889,010	6,688,596	10,094,990
2005	2,313,468	1,649,210	6,123,049	10,085,727
2006	1,998,902	1,648,405	7,282,328	10,929,635
2007	1,697,350	1,893,031	8,777,570	12,367,950
2008	1,720,683	1,306,996	9,572,258	12,601,945
Average	1,924,848	1,627,057	7,618,281	11,170,521

Source: The Headboat Survey, NOAA Fisheries, SEFSC, Beaufort Lab and MRFSS database, NOAA Fisheries, NMFS, SERO.
[1] Pounds of A and B1 fish estimated from the MRFSS Survey.
[2] The total annual estimate of headboat catch derived from data collected through the NMFS headboat survey.

Table 3-40. Harvest of snapper grouper species by state in the South Atlantic, 2003-2008.

Year	Florida	Georgia	South Carolina	North Carolina
2003	7,848,011	770,993	1,042,157	1,281,714
2004	5,970,816	763,609	1,625,212	1,735,353
2005	6,696,212	622,302	852,105	1,915,107
2006	6,474,221	746,982	1,466,944	2,241,489
2007	7,173,255	320,927	2,079,880	3,199,767
2008	7,262,726	490,209	1,980,075	2,866,928
Average	6,904,207	619,170	1,507,729	2,206,726

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

There are nine snapper grouper species most affected by this amendment. The distribution by mode of these nine species in the South Atlantic is presented in Table 3-41. Four species (black sea bass, gag, red grouper, and vermilion snapper) showed relatively large harvests over the 2003-2008 period. Black sea bass accounted for the largest harvest at an average of 0.78 MP, followed somewhat closely by gag at an average of 0.62 MP and vermilion snapper at an average of 0.60 MP. Except for golden tilefish, snowy grouper, speckled hind, and vermilion snapper, the shore and private mode of fishing dominated the harvest of the nine species. Charterboats dominated in the harvest of golden tilefish and snowy grouper while headboats dominated in the harvest of speckled hind and vermilion snapper. Headboats reported no landings of golden tilefish.

The geographic distribution of the affected species is shown in Table 3-42. Florida registered harvests of all these species; Georgia did not show harvests of golden tilefish, snowy grouper, and black grouper; South Carolina did not show harvests of golden tilefish; and North Carolina did not register any harvest of black grouper. With the exception of black sea bass, red grouper, vermilion snapper, and golden tilefish, Florida dominated all other states in the harvest of the subject species. South Carolina was the dominant state in the harvest of black sea bass and vermilion snapper while North Carolina dominated in the harvest of red grouper.

Seasonal distribution of the affected species is presented in Table 3-43, with the monthly headboat data aggregated to match the MRFSS two-month wave. Except for golden tilefish and black grouper, the peak harvest period for the subject species was May-June. Golden tilefish peaked in July-August while black grouper peaked in July-August or November-December. Six species (golden tilefish, snowy grouper, black sea bass, gag, red grouper, and vermilion snapper) had their lowest harvests in January-February. Speckled hind and warsaw grouper had their lowest harvests in November-December while black grouper had its lowest harvests in March-April.

Table 3-41. South Atlantic average harvest (lbs) of 9 major species affected by this amendment by mode (2003-2008).

Species	Charterboat	Headboat	Shore and Private/Rental Boat	Total
Golden Tilefish	46,202	0	10,819	57,021
Snowy Grouper	44,614	585	2,123	47,322
Speckled Hind	864	1,291	79	2,235
Warsaw Grouper	3,207	1,168	11,708	16,082
Black Grouper	2,568	13,556	33,051	49,174
Black Sea Bass	93,691	164,465	525,001	783,157
Gag	101,539	64,547	456,471	622,558
Red Grouper	51,741	45,662	401,412	498,815
Vermilion Snap.	111,521	379,710	105,005	596,237

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

Table 3-42. South Atlantic average harvest (lbs) of 9 major species affected by this amendment by state (2003-2008).

Species	Florida	Georgia	South Carolina	North Carolina
Golden Tilefish	3,522	0	0	53,499
Snowy Grouper	30,421	0	123	16,779
Speckled Hind	1,165	9	896	165
Warsaw Grouper	15,621	17	243	200
Black Grouper	49,082	0	93	0
Black Sea Bass	244,222	87,574	245,727	205,635
Gag	385,393	14,042	39,089	184,034
Red Grouper	128,496	50	8,143	362,127
Vermilion Snap.	183,484	45,941	231,503	135,308

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

Table 3-43. South Atlantic average harvest (lbs) of 10 major species affected by this amendment by two-month wave (2003-2008).

Species	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sept-Oct	Nov-Dec
Golden Tilefish	0	843	19,878	31,938	4,362	0
Snowy Grouper	181	864	28,875	11,872	481	5,049
Speckled Hind	97	158	1,288	472	175	45
Warsaw Grouper	663	1,268	8,037	189	5,864	60
Black Grouper	9,616	3,080	6,800	13,069	3,176	13,433
Black Sea Bass	45,768	144,853	220,940	178,973	62,636	129,988
Gag	83,007	84,466	153,795	116,837	88,176	96,278
Red Grouper	17,380	77,091	199,260	105,223	62,412	37,449
Vermilion Snapper	28,129	84,106	190,469	159,457	85,613	48,463

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

For the period 2003-2007, the nine major species described above accounted for about 24% of all recreational harvests of snapper grouper in the South Atlantic.

3.8.2.2 Effort

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

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

Estimates of recreational effort for the entire snapper grouper fishery in the South Atlantic are provided in Table 3-44 for trips by mode and Table 3-45 for trips by state. The total column refers to the total number of snapper grouper angler trips by mode or by state and not to the sum of catch and target trips.

In the South Atlantic, total angler trips were highest for the private mode, followed by the shore mode, and then by the charter mode (Table 3-44). Average catch trips were highest on those taken through the private mode and lowest on those through the charter mode. The same is true with target trips: they were highest for private mode and lowest for charter mode. For the charter mode, target trips rose steadily through the years while catch trips fluctuated and peaked in 2007. Shore mode catch trips dropped from 2003 to 2004 but steadily increased thereafter to a peak in 2007; shore mode target trips fell from 2003 to 2005 and increased thereafter to a peak in 2007. For the private mode, both catch and target trips fell in 2004 but increased thereafter, reaching a peak in 2007.

By far, Florida registered the highest total angler trips, followed in order by North Carolina, South Carolina, and Georgia (Table 3-45). The same pattern holds for catch trips but not quite for target trips, with South Carolina registering higher target trips than North Carolina. For Florida, both catch and target trips fell in 2004, subsequently rose in the following years, and peaked in 2007. Georgia catch trips fluctuated between 2003 and 2006 and remained at relatively high levels in the last two years; target trips fell substantially in 2004, remained at low levels until 2007, and rose in 2008 to a level close to that in 2003. South Carolina catch trips fluctuated at relatively low levels between 2003 and 2005 but at higher levels in subsequent years; target trips fell in 2004 but subsequently rose to a peak in 2007. Catch trips in North Carolina steadily rose over the years and peaked in 2007; target trips, on the other hand, fluctuated throughout the period.

Table 3-44. Recreational effort for the snapper grouper fishery in the South Atlantic, in thousand trips by mode (2003-2008).

	Charter Mode Trips			Shore Mode Trips			Private Mode Trips		
	Catch	Target	Total	Catch	Target	Total	Catch	Target	Total
2003	117	24	412	982	247	6,493	2,026	687	9,963
2004	135	33	434	851	199	6,754	1,867	496	9,369
2005	127	32	508	924	192	7,009	2,055	517	10,073
2006	109	31	459	1,151	257	8,211	2,520	556	10,749
2007	136	47	501	1,308	297	7,983	3,163	783	13,137
2008	124	48	439	1,002	270	6,317	2,629	772	11,009
Avg.	125	36	459	1,036	244	7,128	2,377	635	10,717

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

Table 3-45. Recreational effort for the snapper grouper fishery in the South Atlantic, in thousand trips by state (2003-2008).

	Florida			Georgia			South Carolina			North Carolina		
	Catch	Target	Total	Catch	Target	Total	Catch	Target	Total	Catch	Target	Total
2003	2,716	761	11,444	92	46	971	141	95	2,098	175	56	2,354
2004	2,342	558	10,660	87	26	936	184	85	2,239	239	59	2,721
2005	2,595	607	12,049	96	26	851	143	58	2,083	272	48	2,607
2006	3,126	627	13,115	66	28	790	214	133	2,629	374	56	2,885
2007	3,780	876	15,169	117	26	926	295	140	2,529	416	86	2,996
2008	2,947	841	11,215	226	42	1,282	246	134	2,528	336	73	2,740
Avg.	2,918	712	12,275	114	32	959	204	108	2,351	302	63	2,717

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

Estimates of recreational effort for the nine major species affected by this amendment are provided in Table 3-46 for trips by mode and Table 3-5471 for trips by state. The total column refers to the total number of angler trips by mode or by state and not to the sum of catch trips and target trips.

In terms of target trips, the private mode dominated the other two fishing modes in all nine species (Table 3-46). Except for speckled hind and warsaw grouper, the charter mode dominated the other two modes in terms of catch trips. Catch trips were highest for black sea bass across all modes. Target trips, on the other hand, varied by mode: black sea bass was highest for charter and private modes while gag was highest for the shore mode. The charter mode showed no target trips for speckled hind, warsaw grouper, black grouper, and red grouper. The shore mode registered no catch trips for golden tilefish, snowy grouper, and warsaw grouper as well as no target trips for golden tilefish, speckled hind, snowy grouper, speckled hind, warsaw grouper, and vermilion snapper. The private mode showed no target trips for speckled hind and warsaw grouper.

There are also observable regional variations in catch and target trips for the nine major species (Table 3-47). In both catch and target trips, Florida dominated all other states for most species except for black seas bass for which South Carolina registered higher target trips than any other states, although Florida still registered the highest catch trips for this species, and golden tilefish for which North Carolina registered higher catch trips, although Florida still registered the highest target trips. None of the states showed any

target trips for speckled hind and warsaw grouper. Georgia did not show any catch trips for golden tilefish, snowy grouper, speckled hind, warsaw grouper, black grouper, and red grouper and no target trips for all species except black sea bass. South Carolina showed no catch or target trips for golden tilefish, snowy grouper, speckled hind, and warsaw grouper; it also showed no target trips for red grouper or black grouper. North Carolina registered no catch or target trips for speckled hind, warsaw grouper, and black grouper; it also showed no target trips for snowy grouper.

The seasonal distribution of recreational effort for the nine species in this amendment is presented in Table 3-48 for catch trips and Table 3-49 for target trips. The peak period for catch trips matched with peak harvests for all species, except snowy grouper, black sea bass, gag, and vermilion snapper. Catch trips for snowy grouper, vermilion snapper and black sea bass peaked in July-August, whereas harvests of these species peaked in May-June. Catch trips for gag were highest and about equal in September-October and November-December, whereas harvest peaked in May-June. For target trips, the match between peak trips and peak harvests occurred with vermilion snapper, black sea bass, black grouper, and red grouper. Peak target trips for golden tilefish occurred in September-October while peak harvests for these species occurred in July-August. Peak target trips for snowy grouper also occurred in September-October while peak harvests occurred in May-June. Peak target trips for gag occurred in June-July, whereas peak harvests occurred in May-June.

Table 3-46. South Atlantic average recreational effort for the 9 species affected by this amendment, in thousand trips by mode (2003-2008).

	Charter Mode Trips			Shore Mode Trips			Private Mode Trips		
Species	**Catch**	**Target**	**Total**	**Catch**	**Target**	**Total**	**Catch**	**Target**	**Total**
Golden Tilefish	2.6	0.2	458.8	0.0	0.0	7,127.8	1.5	0.4	10,716.6
Snowy Grouper	2.2	0.2	458.8	0.0	0.0	7,127.8	1.9	0.3	10,716.6
Speckled Hind	0.1	0.0	458.8	0.2	0.0	7,127.8	1.3	0.0	10,716.6
Warsaw Grouper	0.2	0.0	458.8	0.0	0.0	7,127.8	1.1	0.0	10,716.6
Black Grouper	0.8	0.0	458.8	0.8	0.1	7,127.8	14.3	3.4	10,716.6
Black Sea Bass	35.0	3.7	458.8	40.6	0.9	7,127.8	490.8	45.7	10,716.6
Gag Grouper	7.6	1.8	458.8	9.8	1.7	7,127.8	99.7	37.4	10,716.6
Red Grouper	9.3	0.0	458.8	1.5	0.4	7,127.8	59.1	3.6	10,716.6
Vermilion Snapper	27.6	0.8	458.8	0.9	0.0	7,127.8	58.6	2.2	10,716.6

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

Table 3-47. South Atlantic average recreational effort (thousand trips) for the 9 species affected by this amendment by state (2003-2008).

	Florida			Georgia			South Carolina			North Carolina		
Species	**Catch**	**Target**	**Total**	**Catch**	**Target**	**Total**	**Catch**	**Target**	**Total**	**Catch**	**Target**	**Total**
Golden Tilefish	1.1	0.4	12,275.4	0.0	0.0	959.5	0.0	0.0	2,351.0	3.0	0.2	2,717.2
Snowy Grouper	2.7	0.6	12,275.4	0.0	0.0	959.5	0.0	0.0	2,351.0	1.5	0.0	2,717.2
Speckled Hind	1.5	0.0	12,275.4	0.0	0.0	959.5	0.0	0.0	2,351.0	0.0	0.0	2,717.2
Warsaw Grouper	1.3	0.0	12,275.4	0.0	0.0	959.5	0.0	0.0	2,351.0	0.0	0.0	2,717.2
Black Grouper	15.7	3.6	12,275.4	0.0	0.0	959.5	0.2	0.0	2,351.0	0.0	0.0	2,717.2
Black Sea Bass	197.7	12.0	12,275.4	43.4	5.7	959.5	143.9	23.1	2,351.0	181.4	9.6	2,717.2
Gag Grouper	93.1	38.6	12,275.4	3.0	0.0	959.5	5.1	1.3	2,351.0	15.8	1.0	2,717.2
Red Grouper	52.6	3.5	12,275.4	0.0	0.0	959.5	0.8	0.0	2,351.0	16.4	0.4	2,717.2
Vermilion Snapper	59.2	1.7	12,275.4	6.0	0.0	959.5	10.5	1.1	2,351.0	11.4	0.3	2,717.2

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

Table 3-48. South Atlantic average catch trips (all modes) for the 9 species affected by this amendment by two-month wave (2003-2008).

Species	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sept-Oct	Nov-Dec
Golden Tilefish	0.4	0.0	1.0	2.1	0.6	0.0
Snowy Grouper	0.7	0.2	0.8	1.2	0.9	0.5
Speckled Hind	0.2	0.3	0.1	0.6	0.0	0.3
Warsaw Grouper	0.0	0.1	0.4	0.0	0.4	0.3
Black Grouper	2.5	2.0	3.0	2.9	1.9	3.6
Black Sea Bass	27.2	70.4	138.1	148.1	103.0	79.7
Gag	15.3	15.8	19.5	17.6	24.1	24.9
Red Grouper	10.3	10.7	17.3	11.1	8.3	12.3
Vermilion Snapper	8.7	15.1	19.5	22.6	12.5	8.7

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

Table 3-49. South Atlantic average target trips (all modes) for the 9 species affected by this amendment by two-month wave (2003-2008).

Species	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sept-Oct	Nov-Dec
Golden Tilefish	0.3	0.0	0.1	0.1	0.2	0.0
Snowy Grouper	0.0	0.0	0.1	0.1	0.3	0.0
Speckled Hind	0.0	0.0	0.0	0.0	0.0	0.0
Warsaw Grouper	0.0	0.0	0.0	0.0	0.0	0.0
Black Grouper	0.5	0.5	0.8	0.7	0.3	0.8
Black Sea Bass	3.0	11.8	12.5	8.6	6.0	8.3
Gag	6.5	8.4	7.3	8.9	3.4	6.3
Red Grouper	0.5	0.4	1.1	0.6	0.4	0.9
Vermilion Snapper	0.7	0.6	0.9	0	0.4	0.4

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

Similar analysis of recreational effort is not possible for the headboat sector since data are not collected at the angler level. Estimates of effort in the headboat sector are provided in terms of angler days or the number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. Despite the inability to associate headboat effort with specific species, the stationary bottom nature of headboat fishing, as opposed to trolling, suggests that most headboat trips and, hence, angler days, are snapper grouper trips by intent.

The state-by-state distribution of headboat angler days is presented in Table 3-50. Due to very low headboat angler days for Georgia, entries for Georgia are combined with those of Florida. For the period 2003-2008, total headboat angler days fluctuated around an average of 230,878 days. On average, Florida and Georgia accounted for the largest number of angler days (157,764) or about 68% of all headboat angler days. Nevertheless, the numbers for South Carolina (47,524 days) and North Carolina (25,591 days) are far from negligible.

The seasonal distribution of headboat angler days is presented in Table 3-51. The peak for angler days consistently occurred in July-August each year. The troughs occurred in the last two months of the year, except for 2004 and 2008 when troughs occurred in September-October.

Table 3-50. South Atlantic headboat angler days (2003-2008).

Year	Georgia & Florida	South Carolina	North Carolina	Total
2003	145,011	36,556	22,998	204,565
2004	173,701	50,461	27,255	251,417
2005	171,078	34,036	31,573	236,687
2006	175,522	56,074	25,736	257,332
2007	157,150	60,729	29,002	246,881
2008	124,119	47,287	16,982	188,388
Average	157,764	47,524	25,591	230,878

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

Table 3-51. South Atlantic headboat angler days, by two-month wave, 2003-2008.

Year	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sept-Oct	Nov-Dec
2003	21,805	36,363	48,210	59,982	22,431	15,774
2004	27,593	45,468	59,144	70,141	22,811	26,260
2005	27,672	41,799	54,892	70,369	21,390	20,565
2006	27,432	48,572	60,525	73,413	29,344	18,046
2007	24,285	41,464	57,268	75,900	27,029	20,935
2008	21,587	36,634	49,223	51,635	13,768	15,541
Average	25,062	41,717	54,877	66,907	22,796	19,520

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

3.8.2.3 Permits

For-hire vessels in the South Atlantic are required to have a snapper grouper for-hire permit to fish for or possess snapper grouper species in the EEZ. The number of permitted vessels for the period 2003-2008 is provided in Table 3-52. This sector operates as an open access fishery and not all permitted vessels are necessarily active in the fishery. Some vessel owners have been known to purchase open access permits as insurance for uncertainties in the fisheries in which they currently operate.

The number of for-hire permits issued in the South Atlantic snapper grouper fishery increased over the period 2003-2008, from 1,477 permits in 2003 to 1,811 permits in 2008. Most of the increases would likely be for strictly for-hire business, since permits issued for vessels operating as for-hire and commercial entities remained about flat from 2003 to 2006 and fell in 2007. The majority of snapper grouper for-hire permitted vessels were home-ported in Florida; a good number of vessels were also home-ported in North Carolina and South Carolina. Interestingly, there were several vessels with homeports in states other than those within the South Atlantic Council's area of jurisdiction. Most of the vessels with both for-hire and commercial permits were home-ported in the South Atlantic Council's area of jurisdiction.

The for-hire permit does not distinguish whether the vessel operates as a charterboat or headboat. 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.

Table 3-52. South Atlantic snapper grouper for-hire permit holders by home port state (2003-2008).

	Number of vessels issued for-hire vessel permits							Number of vessels with both a for-hire permit and a commercial snapper grouper permit						
Home Port State	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**Avg.**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**Avg.**
Florida	957	1,084	1,119	1,108	1,140	1,125	**1,115**	148	151	148	151	122	128	**141**
North Carolina	206	232	254	284	315	342	**272**	45	42	43	46	40	43	**43**
South Carolina	122	108	121	119	129	140	**123**	34	33	33	34	24	25	**31**
Georgia	36	27	33	33	30	27	**31**	4	2	2	2	3	4	**3**
Virginia	5	13	10	10	8	18	**11**		4	3	2		0	**2**
Other States	69	48	51	62	69	85	**64**	8	3	5	3	2	3	**4**
Gulf States	82	82	79	65	63	74	**74**							
Total	**1,477**	**1,594**	**1,667**	**1,681**	**1,754**	**1,811**	**1,690**	**239**	**235**	**234**	**238**	**191**	**203**	**224**

Source: Southeast Permits Database, NOAA Fisheries, SERO.

3.8.2.4 Economic Value, Expenditures, and Economic Impacts

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.

Estimates of the economic value of a day of saltwater recreational fishing in the South Atlantic indicate that the mean value of access per marine recreational fishing trip is $109.31 for the South Atlantic (Haab *et al.* 2001). While this estimate is not specific to snapper grouper fishing trips, it may shed light on the magnitude of an angler's willingness to pay for this type of recreational experience.

Willingness to pay for an incremental increase in catch and keep rates per trip was also estimated to be $3.01 for bottom fish species by Haab and Haab (2001). Whitehead *et al.* (2001) estimated the marginal willingness to pay to avoid a one fish red snapper bag limit decrease to be $1.06 to $2.20. Finally, Haab *et al.* (2001) provided a compensating variation (the amount of money a person would have to receive to be no worse off after a reduction of the bag limit) estimate of $2.49 per fish when calculated across all private boat anglers that targeted snapper grouper species in the South Atlantic.

In their study of the North Carolina for-hire fishery, Dumas *et al.* (2009) estimated several measures of consumer surplus for anglers fishing through the for-hire mode. Anglers were distinguished as to whether fishing was their primary or secondary purpose for taking the trip to the coasts. An additional snapper grouper caught and kept would generate consumer surplus of $93.51 per trip for primary purpose anglers and $60.79 per trip for secondary purpose anglers. Consumer surplus per site per trip for primary purpose anglers ranged from $4.88 to $27.03 in charter trips taken in Federal waters, or from $0.35 to $9.55 in charter trips taken in state waters. The corresponding range of values for secondary purpose anglers was $0.24 to $16.62 for charter trips in Federal waters, or $0.12 to $16.54 for charter trips in state waters. On headboat trips in both state and Federal waters, consumer surplus per site per trip ranged from $0.59 to $4.12 for primary purpose anglers and from $0.48 to $4.76 for secondary purpose anglers. Consumer surplus for the opportunity to take a for-hire fishing trip was estimated at $624.02 per angler per trip on charterboats and $101.64 per anger per trip on headboats.

In addition to the above economic values, there are estimates of the economic value of a red snapper and a red snapper trip provided in (NMFS 2008a). Although these values are derived for the Gulf of Mexico recreational fishery, they can be used as proxy values for the South Atlantic fishery. It is noted, however, that red snapper is a significantly more important recreational target fishery in the Gulf of Mexico than in the South Atlantic. As a result, the estimates of economic value may overstate the true values for the South

Atlantic. The estimated CS to a recreational angler of one red snapper is $6.04, while the estimated CS of a red snapper fishing trip is $53.53. These values were used to estimate the impacts of the red snapper interim rule in the South Atlantic.

Most recently, the NMFS Southeast Science Center (NMFS 2009a) developed estimates of consumer surplus per angler trip based on various studies and data in the last ten years (see **Appendix M**). These estimates were culled from various studies – Haab *et al.* (2009), Dumas *et al.* (2009), and NMFS (2009b). The values/ranges of consumer surplus estimates are (in 2009 dollars) $112 to $128 for red snapper, $123 to $128 for grouper, $11 for other snappers, and $80 for snapper grouper. These values are deemed directly applicable in assessing the changes in consumer surplus due to management measures being considered in Amendment 17A.

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 (PS) is the measure of the economic value these operations receive. PS 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 PS associated with for-hire trips are not available. However, proxy values in the form of net operating revenues are also provided in NMFS (2008a). These values are not PS estimates because they are not net of crew costs and returns to the owner. The estimated net operating revenues per angler trip for the for-hire sector are $162 for a charterboat trip and $78 for a headboat trip.

The NOAA Fisheries Service Southeast Science Center recently provided estimates of charterboat and headboat net operating revenues for various areas in the Southeast (NMFS 2009a). 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 are $135 for east Florida, $146 for Louisiana through 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 $160 in North Carolina and $155 in central and south North Carolina. 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, $63 in North Carolina, and $68 in central and south North Carolina. For full day and overnight headboat trips, net operating revenues are $74 in North Carolina and $77 in central and south North Carolina.

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

Estimates of the economic impacts of the recreational snapper grouper fishery were derived using average output (sales) and job (FTE) impact coefficients for recreational angling across all fisheries (species), as derived by an economic add-on to the MRFSS, and described and utilized in NMFS (2009c). Estimates of the average expenditures by recreational anglers are provided in NMFS (2009c) and are incorporated herein by reference. Estimates of the average snapper grouper effort (2003-2007) and associated economic impacts (2007 dollars) are provided in Table 3-53. Snapper grouper target trips were selected as the measure of snapper grouper effort. More trips catch snapper grouper than target snapper grouper, however, as described in Tables 3-46 and 3-47. Estimates of the economic impacts associated with snapper grouper 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. For example, if the number of catch trips were three times the number of target trips for a particular state and mode, the estimate of the associated output or jobs impacts would equal three times the estimate associated with target trips. The total 2007 output (sales) impacts across all modes and states for trips which targeted snapper grouper was approximately $43.3 million, the value added impact was approximately $25.3 million, and the economic activity associated with these trips supported an estimated 467 FTE jobs (Table 4-53). Contributions by private/rental mode anglers were the greatest, accounting for approximately half of the total impacts. It should be noted that output impacts and value added impacts are not additive.

Table 3-53. Summary of snapper grouper target trips (2003-2007 average) and associated economic impacts (2007 dollars).

	North Carolina	South Carolina	Georgia	East Florida	Total
	Shore Mode				
Target Trips	22,713	12,046	6,650	210,735	252,144
Output Impact*	$3,620,977	$1,093,668	$100,261	$5,810,261	$10,625,167
Value Added Impact*	$2,016,356	$608,981	$60,119	$3,373,175	$6,058,631
Jobs	44	13	1	62	120
	Private/Rental Mode				
Target Trips	58,883	85,387	22,275	402,804	569,349
Output Impact*	$3,209,442	$3,726,440	$337,692	$14,698,955	$21,972,529
Value Added Impact*	$1,809,705	$2,174,328	$204,838	$8,783,407	$12,972,278
Jobs	35	42	3	155	234
	Charter Mode				
Target Trips	1,493	3,068	1,543	24,665	30,769
Output Impact*	$556,467	$966,706	$91,719	$9,041,651	$10,656,542
Value Added Impact*	$312,290	$546,149	$53,530	$5,323,074	$6,235,044
Jobs	7	12	1	93	113
	All Modes				
Target Trips	83,089	100,501	30,468	638,204	852,262
Output Impact*	$7,386,885	$5,786,815	$529,671	$29,550,867	$43,254,238
Value Added Impact*	$4,138,351	$3,329,458	$318,488	$17,479,656	$25,265,953
Jobs	85	68	5	309	467

Source: effort data from the MRFSS, economic impact results calculated by NMFS SERO using the model developed for NMFS (2009c). * Output and value added impacts are not additive.

As noted in the previous paragraph, the values provided in Table 3-53 reflect only effort derived from the MRFSS. Because the headboat sector in the Southeast is not covered in the MRFSS, the results in Table 3-53 do not include estimates of the economic impacts by headboat anglers. Estimates of headboat effort are available, however, from the NMFS Headboat Survey and are provided in Tables 3-50 and 3-51. Species target information, however, is not collected in the Headboat Survey, which prevents the generation of estimates of the number of headboat target trips for individual species. It is assumed for the purpose of this assessment, though, that while some headboat anglers may not care what species they catch, all headboat anglers expect to catch snapper grouper due to the bottom fishing-nature of headboat angling. As a result, using total headboat effort as a proxy for snapper grouper target effort is not expected to be a significant issue for estimating the economic impacts associated with snapper grouper trips in the headboat sector.

Estimates of the economic impacts associated with headboat snapper grouper effort are provided in Table 3-54. Aside from the issue of possibly using too high a measure of target effort, it should be noted that the estimates of economic impacts are expected to be substantially higher than actual impacts because they were generated using the average impact values associated with charter trips. Because the headboat sector is not included in the MRFSS in the South Atlantic, appropriate estimates of the economic impacts per headboat trip in South Atlantic states were not generated in the development of NMFS (2009c) and are not available. Estimates of the impacts of charter trips are expected to be substantially greater than those of headboat trips. The difference in fee scale for charter trips compared to headboat trips, where a charter trip is rented on a boat basis whereas anglers pay per person for headboat trips, may be the primary determinant in the difference, but other factors, such as different rates of tourist versus local clientele, may also contribute. The headboat (party boat) sector is included in the MRFSS in the mid-Atlantic (and New England) states and the estimated output (sales) impact per trip for charter and party boats combined in the mid-Atlantic states ranges from approximately $140 to $180 (2007 dollars), whereas the output (sales) impact per charter trip across all South Atlantic states is estimated to exceed $300 (NMFS 2009c). Further, the mid-Atlantic values may exceed actual values for just headboat (partyboat) trips because they incorporate charter trips as well in their total. Rather than use an alternative value from outside the region, this analysis simply uses the higher South Atlantic charter value and notes that actual impacts could be substantially less than the estimated value.

Table 3-54. Summary of snapper grouper headboat trips (2003-2007 average) and associated economic impacts (2007 dollars).

	North Carolina	South Carolina	Georgia+Florida	Total
Trips	27,312	47,571	164,492	239,375
Output Impact	$10,179,650	$14,989,306	$60,299,176	$85,468,133
Value Added Impact	$5,712,840	$8,468,342	$35,499,819	$49,681,001
Jobs	130	191	620	941

Source: effort data from the NMFS Headboat Survey, economic impact results calculated by NMFS SERO using the model developed for NMFS (2009c). Note: these estimated economic impact values may substantially exceed actual values because they are based on average trip values from charter trips. Output and value added impacts are not additive.

As seen in Table 3-46, among the major snapper grouper species, black sea bass, and gag have been subject to the most recreational target effort, on average, from 2003-2007. The economic impact contributions of these species are included in the information in Table 3-53. Individually, the economic impacts associated with target trips for black sea bass are estimated to be approximately $3 million (2007 dollars) in output (sales) impacts, approximately $1.7 million in value added impacts, and the economic activity associated with trips for these species is estimated to support 35 FTE jobs (based on the average annual number of black sea bass target trips, 2003-2007; tabular results not shown). It should be noted that because these results are embedded in the results for the entire snapper grouper fishery, they are not additive to the totals in Table 3-53. Across all states, private/rental mode target trips for black sea bass accounted for the largest portion of these impacts, approximately $1.9 million in output (sales) impacts, approximately $1.1 million in value added impacts, and 21 FTE jobs, and across all modes South Carolina led with approximately $1.8 million in output (sales) impacts, approximately $1.0 million in valued added impacts, and 22 FTE jobs. Comparable numbers for gag target trips are approximately $2 million in output (sales) impacts, approximately $1.2 million in value added impacts, and the economic activity associated with this species supports 20 FTE jobs. The private/rental boat mode again contributed the largest portion of these impacts, approximately $1.2 million and $700,000 in output (sales) and value added impacts, respectively, and 13 FTE jobs, and most of the activity occurred in Florida, accounting for approximately $1.9 million and $1.1 million in output (sales) and value added impacts, respectively, and accounted for 19 of the total 20 FTE jobs associated with this species.

For the reasons discussed above on the economic impacts of snapper grouper trips, estimates of the economic impacts of headboat target trips for individual snapper grouper species cannot be produced with available data.

3.8.2.5 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 percent) Florida charter operators offered half-day and full-day trips and about 15 percent 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.

3.8.3 Social and Cultural Environment

A more detailed description of the social and cultural environment of the snapper grouper fishery is contained in Amendment 13C (SAFMC 2006) and is incorporated herein by reference. The following sections summarize key information relevant to this action. Key communities were identified primarily based on permit and employment activity. These data were obtained from the U.S. Bureau of the Census and from state and federal permitting agencies.

Permit trends are hard to determine, since several factors may affect how many vessels are homeported in certain communities, including vessel mobility, shifting stock locations, and resettlement of fishermen due to coastal development. Nevertheless, although vessel location shifts occur, static geographical representations help determine where impacts may be felt.

Data from the US Census Bureau must be used with some caution. Census data are collected every ten years and may not reflect shifting community demographics. Businesses routinely start up and fail or move and the census data collection cycle may fail to capture key changes. Further, census estimates do not include seasonal visitors and tourists, or those that live less than half the year in a surveyed area. Many of the latter group may work as seasonal employees and not be counted. Census data also

misses some types of labor, such as day laborers, undocumented crew members, or family members that help with bookkeeping responsibilities.

Permit requirements for the commercial Snapper Grouper fishery were established in 1998 by Snapper Grouper Amendment 8 (SAFMC 1997). Amendment 8 created a limited entry system for the fishery and established two types of permits based on the historic landings associated with a particular permit. Those who could demonstrate a certain amount of landings over a certain time period received permits that did not limit the number of pounds of Snapper Grouper that could be landed from federal waters (hereafter referred to as "unlimited commercial permits"). These permits were transferable. Vessels with verified landings, but did not meet the threshold were issued permits that allowed them to land 225 pounds of Snapper Grouper species from federal waters each trip (hereafter referred to as "limited commercial permits"). These permits were not transferable. New entry into the fishery required the purchase of two unlimited permits from existing permit holders for exchange for a new permit. This "two for one" system was intended to gradually decrease the number of permits in the fishery. These restrictions only applied to the commercial snapper grouper permit.

Impacts on fishing communities from coastal development, rising property taxes, decreasing access to waterfront due to increasing privatization of public resources, rising cost of dockage and fuel, lack of maintenance of waterways and ocean passages, competition with imported fish, and other less tangible (often political) factors have combined to put all these communities and their associated fishing sectors under great stress.

While studies on the general identification of fishing communities have been undertaken in the past few years, little social or cultural investigation into the nature of the snapper grouper fishery itself has occurred. A socioeconomic study by Waters *et al.* (1997) covered the general characteristics of the fishery in the South Atlantic, but those data are now almost 10 years old and do not capture important changes in the fishery. Cheuvront and Neal (2004) conducted survey work of the North Carolina commercial snapper grouper fishery south of Cape Hatteras, but did not include ethnographic examination of communities dependent upon fishing.

To help fill information gaps, members of the South Atlantic Council's Snapper Grouper Advisory Panel, Council members, Advisory Panel members, and representatives from the angling public identified communities they believed would be most impacted by the management measures proposed in Amendment 13C on the species addressed by this amendment. Details of their designation of particular communities, and the factors considered in this designation, can be found in Amendment 13C (SAFMC 2006).

Because so many communities in the South Atlantic benefit from snapper grouper fishing, the following discussion focuses on "indicator communities," defined as communities thought to be most heavily impacted by snapper grouper regulations.

3.8.3.1 North Carolina

Figure 3-10. North Carolina communities with substantial fishing activity, as identified by South Atlantic Advisory Panels.

3.8.3.1.1 Statewide

Overview

Of the four states in the South Atlantic region, North Carolina (Figure 3-10) is often recognized as possessing the most "intact" commercial fishing industry; that is, it is more robust in terms of viable fishing communities and fishing industry activity than the other three states. The state offers a wide variety of fishing opportunities, including sound fishing, trolling for tuna, bottom fishing, and shrimping. Perhaps because of the wide variety of fishing opportunities, fishermen have been better able to weather regulations and coastal development pressures, adjusting their annual fishing patterns as times have changed.

Commercial Fishing

There has been a steady decline in the number of federal commercial snapper grouper permits in North Carolina since 1999, with 194 unlimited commercial permits in 1999, but only 139 in 2004. Limited permits similarly declined from 36 to16.

State license sale and use statistics for all types of licenses also indicate an overall decrease since 1994. While the overall number of state licenses to sell any species of fish or shellfish increased from 6,781 in 1994 to 9,712 in 2001/2002, the number of license holders actually reporting sales decreased from 6,710 in 1994/1995 to 5,509 in 2001/2002 (SAFMC 2006).

North Carolina fishermen demographics are detailed in Cheuvront and Neal (2004). Ninety eight percent of surveyed fishermen were white and 58% had completed some college or had graduated from college. Of those who chose to answer the question, 27% of respondents reported a household income of less than $30,000 per year, and 21% made at least $75,000 per year. On average, respondents had been fishing for 18 years, and had lived in their communities for 27 years.

Cheuvront and Neal (2004) also provided an overview of how North Carolina commercial snapper grouper fishermen carry out their fishery. Approximately 65% of surveyed fishermen indicated year-round fishing. Gag is the fish most frequently targeted by these fishermen, with 61% of fishermen targeting gag at some point in the year, despite the prohibition of commercial sales and limit to the recreational bag limit in March and April. Vermilion snapper (36.3%) and black sea bass (46%) are the next most frequently targeted species. A significant number of fishermen land king mackerel during each month, with over 20% of fishermen targeting king mackerel between October and May. During the gag closed season, king mackerel are targeted by about 35% of the fishermen. Other snapper/grouper complex species landed by at least 5% of the fishermen in any given month were red grouper (39.5%), scamp (27.4%), snowy grouper (9.7%), grunts (14.5%), triggerfish (13.7%), and golden tilefish (5.6%). Non-snapper/grouper complex species landed by at least 5% of the fishermen in any given month included Atlantic croaker, yellowfin tuna, bluefin tuna, dolphin, and shrimp.

By looking at the commercial landings data on the snapper grouper complex it is possible to see which communities are involved with the commercial fisheries for these species (Table 3-55). Although rankings can fluctuate from year to year, this can give us a starting point for understanding some of the communities that would be impacted by more restrictive regulations.

Table 3-55. Top commercial cumulative landings for North Carolina for 2003-2007, listed by species, impacted by this amendment.

	Location	Pounds	Location	Pounds	Location	Pounds
Gag	New Hanover County	675,714	Carteret County	640,750	Brunswick County	390,242
Vermillion Snapper	Brunswick County	2,317,534	Carteret County	1,483,802		
Black Sea Bass	Onslow County	2,100,034	Dare County	1,552,624	New Hanover County	1,165,877
Snowy Grouper	Dare County	439,301	Carteret County	387,333	New Hanover County	211,988
Golden tilefish	Brunswick County	117,658	Dare County	13,526		
Red snapper	Carteret County	60,491	Brunswick County	31,007		
Black grouper	Brunswick County	518	Hyde County	406		
Red grouper	Brunswick County	636,262	New Hanover County	602,521	Carteret County	589,856
Warsaw grouper	Onslow County	15				
Speckled hind	Dare County	428	Hyde County	174		

Source: Logbook data, SEFSC 2009.

Recreational Fishing

Recreational fishing is well developed in North Carolina and, due to natural geography, is not limited to areas along the coast. Data show that North Carolina is almost on par with east Florida for total recreational fishing participation effort (data not shown; see SAFMC 2006). A brief discussion of public boat ramps and local recreational fishing clubs, as well as sources of information used by these anglers, can be found in SAFMC (2006).

The North Carolina state legislature approved creation of a state recreational saltwater fishing license in 2004. The license created controversy for both the recreational and commercial sectors, each believing that it would hurt or help their access to marine resources. Possession of the license, subject to exemptions, has been required as of January 1, 2007 (http://www.ncdmf.net/recreational/NCCRFLfaq.htm).

3.8.3.1.2 Hatteras Village, Dare County

A detailed history of this community, from its discovery by Italian explorers in the 16th century to establishment of a National Seashore in 1953, can be found in SAFMC (2006).

Overview

Census data indicate there was not a significant increase in population size in Hatteras Village from 1990 to 2000 (SAFMC 2006). The demographics of the island have shifted, as is evidenced in the decreasing percentage of the population that is actively in the workforce, perhaps reflecting a larger number of retirees in the community, and the increasing proportion of residents with higher education, also reflecting a retired, professional segment of the population. Hatteras Village has also experienced a significant increase in the percent of the population in the farming, fishing, and forestry occupations, from 5.6% to 10.8%. This may be reflective of the increasing number of persons employed in businesses related to recreational fishing, such as charter boat captains and crew, boat repair and sales, marinas, etc. See SAFMC (2006) for the raw data describing community demographics. Two maps detailing the area are shown in Figure 3-11.

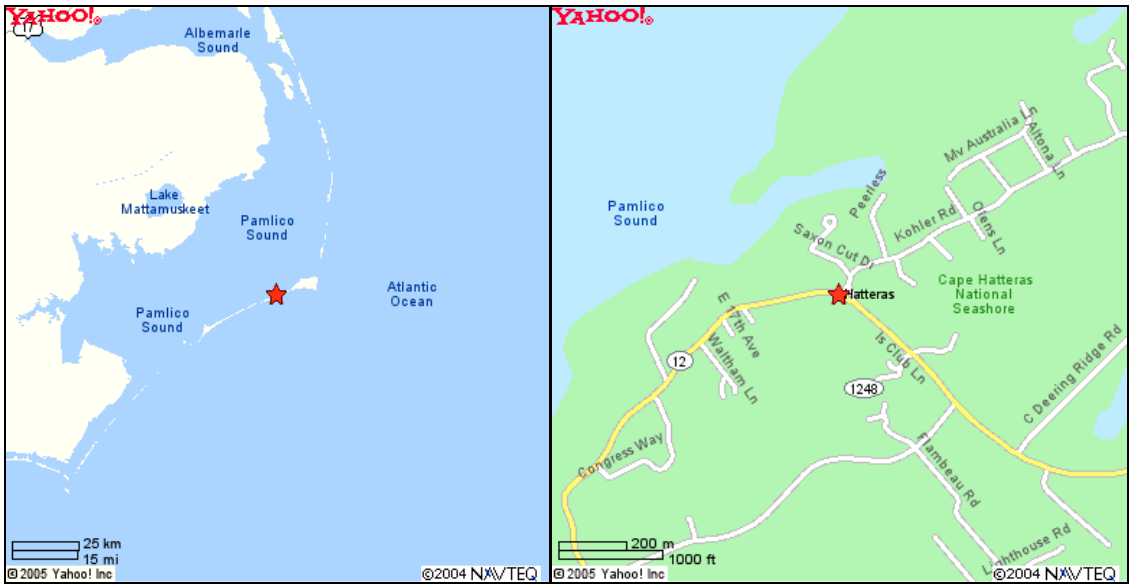


Figure 3-11. Hatteras Island and Village, Outer Banks, North Carolina.
Source: Yahoo Maps, http://www.yahoo.com.

Commercial Fishing

Anecdotal information from Hatteras residents indicates the number of fish houses has decreased as tourism has increased (SAFMC 2006). Residents, however, still promote the fisherman's way of life through festivals and special community designations (SAFMC 2006).

Mirroring the statewide trend, the number of unlimited commercial permits held by residents of Hatteras decreased from 1999 (9 permits) to 2004 (5 permits). The number of limited commercial permits has remained at 3 (SAFMC 2006). Twenty people stated they were employed in a fishing related industry in the 1998 census, with 18 of these employed by marinas. A listing of the six marinas and eight bait and tackle stores in Hatteras Village can be found in SAFMC (2006).

Recreational Fishing

Hatteras is host to several prestigious fishing tournaments and is homeport for the island's famous charter fishing fleet. The number of charter/headboat permits held by Hatteras residents has dramatically increased, from one permit in 1999 to 28 in 2004.

3.8.3.1.3 Wanchese, Dare County

A history of this community, and neighboring Manteo, describing its persistence as a small, close-knit community focused on making its living from the sea, can be found in SAFMC (2006).

Figure 3-12. Map of Roanoke Island, North Carolina, showing Wanchese and Manteo. Source: Kitner 2005.

Overview

A map of Roanoke Island, including Wanchese and Manteo, is shown in Figure 3-12. While Wanchese has maintained its identity as a commercial fishing community, it faces continuing pressure from developers in nearby Manteo and other Outer Banks communities. However, the town has recently approved a zoning document that would prevent unplanned growth and would help preserve working waterfronts and residential areas (Kozak 2005). A partial community profile detailing local traffic patterns, businesses, and prominent families can be found in SAFMC (2006).

The largest industrial area in Wanchese is centered on the Wanchese Seafood Industrial Park, built to enhance business opportunities in the seafood and marine trades. Tenants of the park are able to ship products overnight to major domestic and international markets through the airport in Norfolk, Virginia. The park is utilized by fishermen and seafood dealers, as well as boatbuilding and boat maintenance businesses. The park is full of activity and it is common to find large numbers of people, especially Hispanics, working in the marine trade industries.

Census statistics from 2000 show the population of Wanchese is aging and very homogenous, with little ethnic diversity. There has been a slight increase in the Hispanic population since 1990, mirroring most other communities in North Carolina. Education levels have also increased, and the poverty rate has decreased. A higher percentage of people are employed in fishing-related professions in Wanchese than in almost any other community – 10% – although even that number has decreased nearly 50% since 1990.

Commercial Fishing

Commercial landings and value for Wanchese/Stumpy Point declined from 31.9 million pounds valued at $26.1 million in 2001 to 28.7 million pounds valued at $23.2 million in 2002. In 2001, Wanchese/Stumpy Point was listed as the 28th most prominent United States port based on the value of the product landed, declining to 30th in 2002. While landings increased in 2003, to 33 million pounds, value further declined to $21 million (31st place), with further declines in both poundage (31 million pounds) and value ($20.5 million) in 2004.

Snapper Grouper Amendment 8, which limited entry into the commercial snapper grouper fishery, does not appear to have caused a decrease in the number of commercial permits held by residents of Wanchese (SAFMC 2006). In 1999, seven unlimited commercial permits were held, with eight in 2004. Three limited commercial licenses were held in both 1999 and in 2004.

One hundred twenty residents of Wanchese stated they were employed in fishing related industries in the 1998 census (SAFMC 2006). Sixteen of these were listed as employed in fishing, 56 in fish and seafood and 40 in boatbuilding.

There were 228 commercial vessels registered and 201 state standard commercial fishing licenses issued in the community in 2002 (SAFMC 2006). Wanchese residents also held 12 dealer licenses. The town is an important unloading port for many vessels transiting to and from the Mid-Atlantic and South Atlantic.

Recreational Fishing

As of 2005, nine boatbuilding businesses were located in Wanchese, building either pleasure yachts, recreational fishing vessels or, less often, commercial fishing vessels. There were two bait and tackle businesses and two marinas in town. All these businesses rely on the fishing industry. Manteo also maintains an active private and for-hire recreational fishing community. From 1999 to 2004, there was an increase in the number of charter/headboat licenses held, from two permits to nine permits. As most of the recreational sector for the region operates out of Manteo and Nags Head, these communities would be more affected by recreational fishing restrictions than would Wanchese.

Figure 3-13. Area of Carteret County, North Carolina, showing Morehead City, Atlantic Beach (at the red star), and Beaufort.
Source: Yahoo Maps, http://www.yahoo.com.

3.8.3.1.4 Morehead City, Carteret County

In Carteret County, Morehead City, Beaufort, and Atlantic Beach form a triad of different but complementary communities in close geographic proximity (Figure 3-13). A detailed history of Morehead City, from its founding in the 1840s-1850s to its development as a center for sport and tournament fishing in recent years, can be found in SAFMC (2006).

Overview

Morehead City's economy is currently based on tourism, fishing (commercial and recreational), light industry, government, and other service and professional industries. The town has regained its commercial viability as a modern port terminal and benefits from its location on the "sound-side" of the Atlantic Beach resort trade. Diving has become an important tourist activity; Rodale's Scuba Diving magazine recently named North Carolina as the best wreck diving destination in North America, and Morehead City as the best overall dive destination. Recreational fishing effort is growing quickly, as new marinas, boat storage areas, boat builders, and marine supply stores open in the city.

Detailed statistics detailing community demographics of Morehead City in 1990 and 2000 can be found in SAFMC (2006). The population of Morehead City increased from 1990 to 2000, with sizable increases in the number of people declaring non-white ethnicities. Median income increased from approximately $20,000 to nearly $29,000 from 1990 to 2000. Median home value nearly doubled, and median rent increased 35%. The percentage of those completing high school increased by 10%, and there was a 7% increase in those receiving a bachelor's degree or higher. The poverty level decreased. However, the unemployment rate increased. The occupations of farming, fishing, and forestry employ more than one percent of the population of Morehead City.

Commercial Fishing

In 1998, 100 people were employed in fishing related businesses according to census figures, with 40 employed in marinas and 36 employed in fish and seafood businesses (SAFMC 2006). Over 200 state commercial vessel licenses, 150 state standard commercial fishing licenses, and 14 dealer licenses were issued by the state to residents of Morehead City in 2002. The number of unlimited commercial permits held by Morehead City residents was 15 in 1999 and 14 in 2004, while the three limited commercial permits held in 1999 were no longer held by 2004 (SAFMC 2006). As of 2002, the state had issued 211 commercial vessel registrations, 150 standard commercial licenses, and 14 dealer licenses to Morehead City residents. Residents of Morehead City were primarily employed by marinas (40%) and fish and seafood (36%), with 16% employed in boatbuilding businesses.

A narrative detailing the fishing methods, habits, and observations of a bandit-rig fisherman in Morehead City can be found in SAFMC (2006).

Recreational Fishing

The number of charter/headboat permits held by Morehead City residents nearly doubled, from seven in 1999 to 13 in 2004.

3.8.3.1.5 Beaufort, Carteret County

Beaufort is located on the coast, near Cape Lookout, and borders the southern portion of the Outer Banks. Its deep harbor is home to vessels of all sizes and its marinas are a favorite stop-over for transient boaters. A detailed history of Beaufort, from its establishment to its importance as a trade center during the 18th and 19th centuries, to its later involvement in the menhaden fishing industry, can be found in SAFMC (2006).

Overview

Tourism, service industries, retail businesses, and construction are important mainstays of the Beaufort area, with many shops and restaurants catering to people from outside the area. Census data show a slight decrease in population size from 1990 to 2000, from 3,808 inhabitants to 3,771, perhaps due to the aging population. Educational attainment rose over the last decade, and the percentage of individuals below the poverty line fell slightly. The percentage of those in the labor force decreased, another possible indication of an aging population. However, the percentage unemployed also decreased. The number of people working in farming, fishing, and forestry remained about the same from 1990 to 2000. According to census business pattern data from 1998, most of the fishing-related employment in Beaufort (total 300 persons) occurs in the boat building industry, which employs 184 residents (SAFMC 2006). Forty-eight people reported working in marinas, while others are employed in fish processing, fish harvesting, and seafood marketing.

Commercial Fishing

There has been a slight decrease in the number of unlimited commercial permits held by residents of Beaufort, from 5 permits in1999 to 4 permits in 2004. In the last two years, the one limited commercial permit held by a Beaufort resident was no longer reported. As of 2002, the state had issued 430 commercial vessel registrations, 294 standard commercial licenses, and 32 dealer licenses to Beaufort residents.

Recreational Fishing

There has been virtually no change in the number of charter/headboat permits (1 permit in 2003 and 2004) held by residents.

3.8.3.1.6 Atlantic Beach, Carteret County

Atlantic Beach has been a popular resort town since the 1870s. The first bathing pavilion was built on Bogue Banks in 1887. Tourists flocked to the resorts, and ferry service to Atlantic Beach increased. Other resorts and tourism related development occurred over the next century, and the area remains a popular vacation destination (www.atlanticbeach-nc.com).

Overview

Atlantic Beach demographic data from 1990 and 2000 show a slight population decline since 1990, as well as decreases in the percent of the population involved in farming, fishing, and forestry (SAFMC 2006). The median age of the population has increased, perhaps a reflection of the growing number of retirees moving to this area of the coast.

Commercial Fishing

As observed in other areas of North Carolina, since limited access was put into place, the number of commercial permits has decreased from eight unlimited commercial permits in 1999 to four in 2004, and four limited commercial permits to zero (SAFMC 2006). In 1998, 60 residents of Atlantic Beach were employed in fishing related industry, with 93% of those employed by the marine sector. In 2002, 56 vessels were registered with the state as commercial fishing vessels, 42 standard commercial fishing licenses were held by Atlantic Beach residents, and there were ten valid dealer licenses issued to community members (SAFMC 2006).

Recreational Fishery

Since 1999, the number of federal charter/headboat permits held by Atlantic City residents has increased from six to 19, though only one permit was recorded in 2002. Of the 60 individuals reporting working in a fishing related industry in 1998, 46 worked in marinas. Two state permits were issued to recreational fishing tournaments to sell licenses in 2002 (SAFMC 2006).

Figure 3-14. General area of Sneads Ferry, North Carolina.
Source: Yahoo Maps, http://www.yahoo.com.

3.8.3.1.7 Sneads Ferry, Onslow County

Sneads Ferry is a historical fishing village located on the New River near the northern tip of Topsail Island (Figure 3-14). The river joins the Intracoastal Waterway at Sneads Ferry, with easy access to the Atlantic Ocean. A very active commercial fishing community, Sneads Ferry takes in more fish than any other Onslow County port (http://www.cbcoastline.com). It also includes Camp Lejeune, a U.S. Marine base. The Sneads Ferry Shrimp Festival has been held annually since 1971. Now grown to a two-day event, the annual shrimp festival is the town's major fund-raiser. From its proceeds, the town established a 14-acre community park and built a 7,200-sq. ft. Shrimp Festival Community Building (www.sneadsferry.com/areahistory/his_sf.htm).

Overview

Census data indicate the population of Sneads Ferry increased by about 10% from 1990 to 2000, from 2,031 inhabitants to 2,248. Most new residents were white, and the number of black or African American residents decreased from 159 to 115. Median income increased from about $20,000 to nearly $35,000. Median home value increased from $65,000 to $110,000, but median rent remained about the same. The percentage of those completing high school increased by 10% and the percent of residents with at least a Bachelor's degree doubled, from 6% to 12.8%. The poverty level decreased from 20.9% to 13.5%, and the percentage of the population unemployed decreased from 8.3% to 2.2%. The percentage of residents employed in farming, fishing, and forestry decreased by half from 18.2% to 9%, while employment in sales and office occupations

increased by over 17%. It is unclear who may be buying home sites on newly developed land in the town, but the town's current demographics may point to an increase in retirees in Sneads Ferry, as they are better educated, have higher incomes, and are older. The dramatic decline by approximately 50% of persons employed in extractive natural resource occupations may be due to increasing job opportunities outside of the community, the changing impacts of regulations, or status of the resources

Commercial Fishing

Sneads Ferry is a small town with little of the large-scale development seen elsewhere on the North Carolina coast. Many houses in the community have fishing vessels docked in front of the house or on the lawn. The white rubber boots worn by commercial fishermen in this community and many other parts of North Carolina are commonly referred to as "Sneads Ferry Sneakers", suggesting the importance of commercial fishing to the area. Most of the fishermen in town are shrimpers and net fishermen who go out daily. There is also a strong contingent of black sea bass pot fishermen resident in the town. The species with the highest consistent landings in the town are black sea bass, button clams, blue crab, flounders, mullet, shrimp, spot, and whiting.

The number of federal charter/headboat permits held by residents increased from six in 1999 to 13 in 2004, while the number of unlimited commercial permits decreased from 22 to 17, and the number of limited commercial permits remained at one (SAFMC 2006). Over 347 commercial fishing vessels were registered with the state in 2002, and 228 residents held state-issued standard commercial fishing licenses. There were also 18 dealer licenses in the community and 169 shellfish licenses. In 1998, 16 persons were employed in fishing related industry, with 75% working in fish and seafood.

Recreational Fishing

Recreational fishing in Sneads Ferry is not as prominent an activity as in Morehead City. However, there are a large number of vessels with charter permits for Snapper Grouper homeported there. Little is currently known about recreational fishing out of Sneads Ferry, aside for its advertisement as an important tourist attraction in many websites that discuss the community. At least five marinas cater to recreational fishermen. There are two other marinas at Camp LeJeune Marine Base, just across the Neuse River. Some smaller river and sound fishing charters operating out of the area and one headboat runs from Sneads Ferry. Other than black sea bass, it does not appear that many Snapper Grouper species are frequently caught recreationally from Sneads Ferry.

3.8.3.2 South Carolina

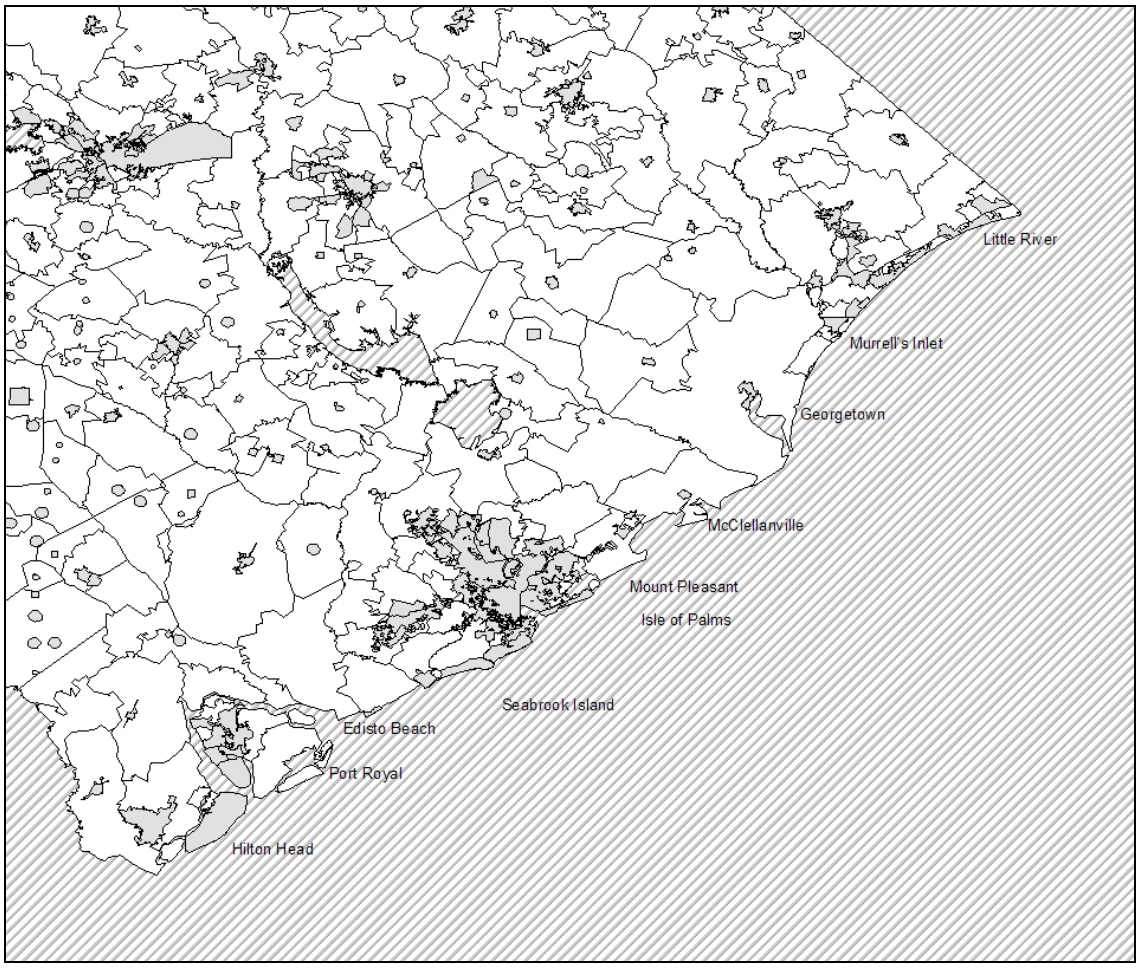


Figure 3-15. South Carolina communities with substantial fishing activity, as identified by South Atlantic Advisory Panels.

3.8.3.2.1 Statewide

Overview

South Carolina communities with substantial fishing activity are less developed than those in North Carolina and, over the past 20 to 30 years, the state has seen much more tourist-oriented development along its coasts than Georgia or North Carolina. In Horry County, the urban area of Myrtle Beach has expanded greatly in the past few decades, and much of the coastal area has been developed as vacation homes, condominiums, and golf courses. The communities most impacted by this development are Little River, Murrells Inlet, Pawleys Island, and Georgetown, although the latter three are located in Georgetown County (Figure 3-15). The same is true of rapid developing Charleston

County, and the cities and communities of McClellanville, Mt. Pleasant, Sullivans Island, Wadmalaw and Edisto Islands feel the impact of urban sprawl from the city of Charleston. Further south along the coast, the Hilton Head Island resort development has been the impetus for changing coastal landscapes in the small towns of Port Royal, Beaufort, St. Helena Island, and Bluffton.

For the purpose of this document, only Little River will be singled out as a community with a high concentration of both commercial and recreational fishing, along with other types of coastal oriented leisure pursuits. Other analyses will consider South Carolina as a whole.

Commercial Fishing

While pockets of commercial fishing activities remain in the state, most are being displaced by the development forces and associated changes in demographics. The number of unlimited commercial permits, however, increased from 74 in 1999 to 87 in 2004, while the number of limited commercial permits decreased by 75% from 12 to 4 (SAFMC 2006).

Recreational Fishing

Many areas that used to be dedicated to commercial fishing endeavors are now geared towards the private recreational angler and for-hire sector. The number of federal charter/headboat permits held by South Carolina residents increased from 41 in 1999 to 111 in 2004. The majority of saltwater anglers fish for coastal pelagic species such as king mackerel, Spanish mackerel, tunas, dolphins, and billfish. A lesser number focus primarily on bottom fish such as snapper and groupers and often these species are the specialty of the headboats that run out of Little River, Murrells Inlet, and Charleston. There are 35 coastal marinas in the state and 34 sportfishing tournaments (SAFMC 2006).

3.8.3.2.2 Little River, Georgetown County

A history of Little River detailing its settlement in the late 1600s, its popularity as a vacation destination in the 1920s, and the concurrent rise in charter fishing, can be found in SAFMC (2006).

Figure 3-16. Little River, South Carolina, and surrounding area.
Source: Yahoo Maps, http://www.yahoo.com.

Overview

Little River and the surrounding area is shown in Figure 3-16. A detailed description of changes in land-use patterns in and near Little River can be found in SAFMC (2006). Nearby Murrells Inlet is gradually transforming into a residential community for Myrtle Beach, and SAFMC (2006) argued this is also true for Little River.

Census data indicate the Little River population more than doubled from 1990 (3,470 persons) to 2000 (7,027 persons) and became more ethnically diverse with more people of American Indian or Alaskan Native, and Hispanic or Latino ethnicities. Median income increased by over 40%, from nearly $29,000 to over $40,000. Median home value also increased by over 40%, and median rent increased by nearly 35%. The percentage of those completing high school and those with a Bachelor's degree remained about the same. The poverty level decreased by nearly two-thirds to 4.7%, and the percentage of the population unemployed decreased from 6.6% to 3.4%. The percentage of residents employed in farming, fishing, and forestry decreased from 3.6% to 0.9%.

Commercial Fishing

In 1998, 38 residents of Little River were employed in fishing related industry according to the U.S. Census, with 81% of those employed by the marina sector. The number of snapper grouper unlimited harvest commercial permits held by community residents remained about the same between 1999 and 2004, from 15 permits to 16 permits, and one resident still held a limited harvest commercial license. Twenty-four Little River

residents held state permits, with the most being saltwater licenses (8 permits) or trawler licenses (5 permits) (SAFMC 2006).

The table below (Table 3-56) shows the commercial cumulative landings by pounds and ranking in the South Atlantic for Little River for the years 2005-2007 for major species in this amendment. Little River had little or no landings of black grouper, speckled hind, or warsaw grouper.

Table 3-56. Cumulative commercial landings in Little River (2005-2007).

Species	Pounds	Ranking in South Atlantic
Gag	409,721	4th
Vermillion Snapper	1,035,287	5th
Black Sea Bass	549,944	6th
Snowy Grouper	289,128	3rd
Golden tilefish	615,373	4th
Red grouper	21,535	20th

Source: Logbook Data, SEFSC 2009.

Recreational Fishing

As observed in other coastal communities described herein, the number of charter/headboat permits held by community residents increased from 9 in 1999 to 16 in 2004. Three headboats operated out of Little River, and this part of the for-hire industry has a long and storied past in the community. Recreational fishing, primarily as headboat effort, came about as a way for commercial fishermen to continue fishing in the summer months. A detailed account of how recreational fishing developed in Little River can be found in Burrell (2000). Most of the private recreational fishing effort in this area occurs out of marinas in North Myrtle Beach, Myrtle Beach, and Murrells Inlet.

3.8.3.3 Georgia

3.8.3.3.1 Statewide

Overview

Only one community in Georgia (Townsend) lands a substantial amount of the snapper grouper species addressed in this amendment. Other parts of the state involved in the commercial harvest of seafood are focused on penaeid shrimp, blue crabs, and other finfish such as flounder, shad, croaker, and mullet.

Brunswick, the other community that has a commercial fishing presence, was once a more thriving commercial fishing community but now tourism and other related activities are competing for waterfront in the town. The most commonly harvested species in Brunswick are blue crab and different species of penaeid shrimp. According to the

ACCSP website, there have been no snapper grouper species landed in Brunswick in since 2001. Other parts of the state involved in the commercial harvest of seafood are focused on penaeid shrimp, blue crabs, and other finfish such as flounder, shad, croaker, and some mullet.

Commercial Fishing

Unlike the pattern observed in many other areas, the number of unlimited commercial permits and limited commercial permits held by Georgia residents did not decrease from 1999 to 2004, with eight permits and one permit, respectively. In 2002, 947 vessels were registered with the state as commercial fishing vessels, 612 full-time state commercial fishing licenses were held by Georgia residents, and 147 residents held part-time state commercial fishing licenses. Within the commercial fishing fleet, four hundred and eighty two vessels had shrimp gear on board in that year (SAFMC 2006).

The table below (Table 3-57) shows the commercial cumulative landings by pounds and ranking in the South Atlantic for Townsend, Georgia for the years 2003-2207 for major species in this amendment. Townsend had little or no landings of black grouper, speckled hind, golden tilefish, or warsaw grouper.

Table 3-57. Cumulative commercial landings in Townsend (2003-2007).

Species	Pounds	Ranking in South Atlantic
Gag	397,284	5
Vermillion Snapper	1,428,918	4
Black Sea Bass	19,790	14
Snowy grouper	33,619	19
Red grouper	21,797	20

Source: Logbook Data, SEFSC 2009.

Recreational Fishing

As observed in other areas, the number of charter/headboat permits held by Georgia residents increased markedly from five permits in 1999 to 27 permits in 2004 (SAFMC 2006). Recreational vessels are located at Tybee Island close to Savannah, on the barrier islands off Brunswick, and between Savannah and Brunswick.

3.8.3.3.2 Townsend, McIntosh County

A history of the area, describing its economy before the Civil War, the rise and fall of lumbering, and the building of the railroad, can be found in SAFMC (2006). Townsend is a small, rural community. In 2005, the fish house in this community was relocating inland. It is not known if this relocation was successful and whether that fish house will be handling domestically harvested fish in the future.

Overview

The population of Townsend increased by over 1,000 residents from 2,413 in 1990 to 3,538 in 2000. Although there was a large relative increase in the number of Hispanic or Latino residents, from 2 to 27, most of the new inhabitants were white (1,465 in 1990 and 2,437 in 2000). Median income increased from approximately $23,000 to $35,000. Median home value nearly tripled, from $33,000 in 1990 to $98,100 in 2000, and monthly rent nearly doubled, from $213 to $431. In 1990, 26.9% of residents had less than a 9th grade education, but by 2000, that number declined to 11.0%. The percentage of those completing high school increased by nearly 15%, while the percent receiving a bachelor's degree or higher remained about the same (8.4% to 8.9%). The percent of the population with an income below the poverty line deceased by 4%, but remained high at 14.6%. The percentage of the population unemployed increased from 3.4% to 6.5%. There has been a sizeable decline in the percentage of the population employed in manufacturing, from 29.0% to 16.2%, and the proportion of the population employed in farming, fishing, and industry remained unchanged at approximately 3%.

Commercial Fishing

A comprehensive description of the historic and current fish houses of coastal Georgia and how they operate, focusing on Phillips Seafood of Townsend, can be found in SAFMC (2006). For nearly a decade, only one fish house has consistently handled snapper grouper species. A fish house in Brunswick may have landed these species in the past, but has not reported landings since 2001.

Recreational Fishing

Offshore recreational anglers do not often target or harvest snapper grouper species in Georgia (http://www.st.nmfs.noaa.gov/st1/recreational/overview/overview.html). Of the snapper grouper species harvested, black sea bass, sheepshead, and vermilion snapper are the most commonly harvested fish at 5%, 7%, and 2%, respectively. As of 2004, residents of the Savannah area held 11 charter/headboat permits for snapper grouper, and many of these vessels are docked on Tybee Island. Residents of the area around the city of Brunswick, including Jekyll Island and Sea Island, held four snapper grouper charter/headboat permits. Interestingly, unlike the cities profiled in the Carolinas, the number of federally permitted for-hire vessels has declined dramatically. From 2003 to 2004, the number of snapper grouper permitted for hire vessels declined from 43 to 27 (NMFS Permits Office). The cause of this decline is unknown.

3.8.3.4 Florida

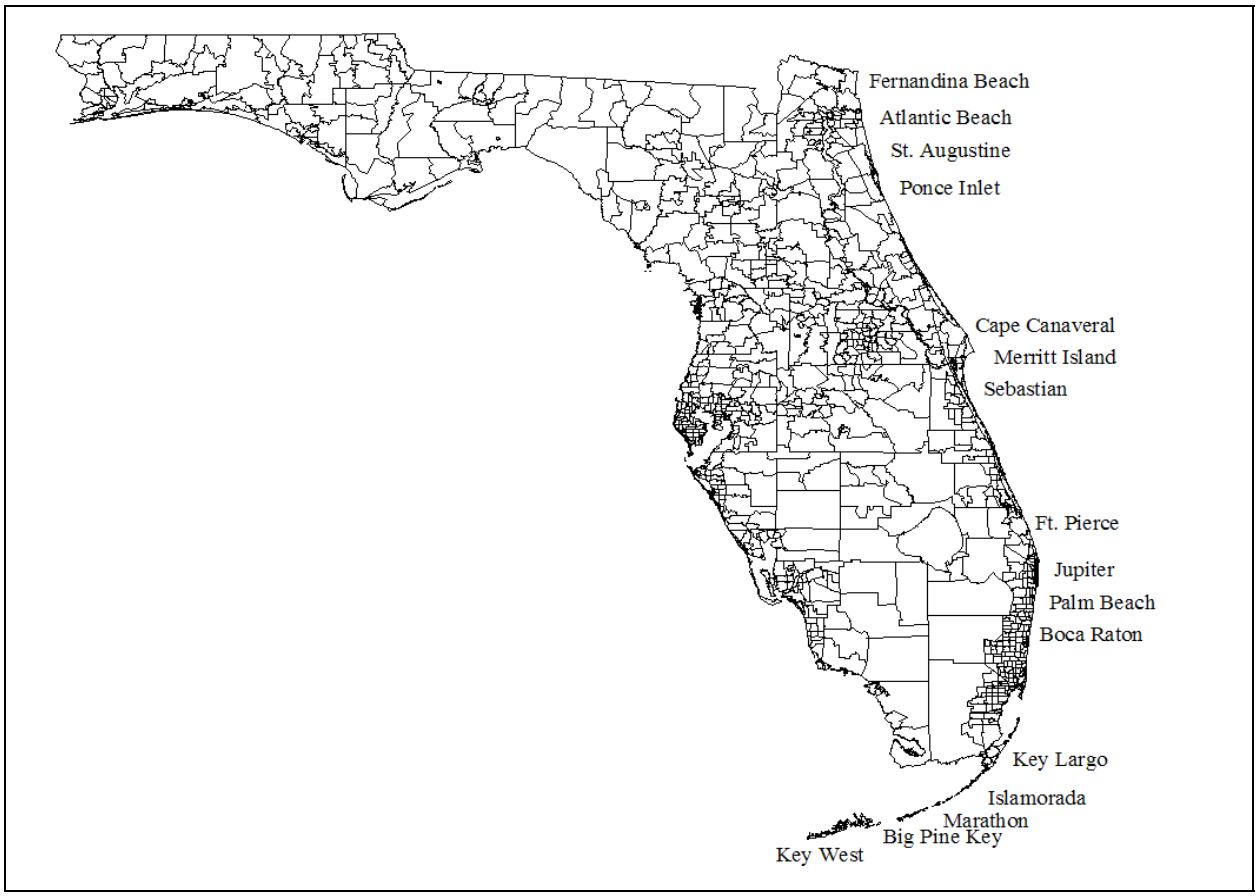


Figure 3-17. Florida communities with substantial fishing activity. Identified by South Atlantic Advisory Panels.
Source: Jepson *et al.* (2005).

3.8.3.4.1 Statewide

Overview

Florida stands apart from other states in the South Atlantic region in fishing behaviors, history, and demographics. Florida has one of the fastest growing populations in the United States, estimated to increase each day by 750 to 1,000 new immigrants. Twenty-five percent of all vacation homes in the United States are located in Florida's coastal counties (Coastal Ocean Resource Economics 2005).

Along with being heavily populated on land, coastal waters off Florida are also heavily used by recreational users of all kinds. This growth of a leisured class occupying coastal areas has led, in part, to conflicts over natural resource access and use-rights. One example of this type of struggle was the conflict over the use of gillnets in state waters. The conflict culminated in a state-wide ban on the use of gillnets, which dealt a

resounding blow to many Florida fishermen, ending in the loss of many commercial fishing properties and the displacement of many fishermen. There have also been conflicts between the "environmental community" and commercial fishermen over the closing of the *Oculina* Bank off of Florida's central coast, and the creation of both the Florida Keys National Marine Sanctuary and the Tortugas Sanctuary, both in the Keys.

The natural geography of Florida also sets it apart from other South Atlantic states, particularly in the area from central Florida through the Keys. The weather is amenable to fishing almost year round, though hurricanes in 2004 were particularly devastating and took a toll on all fisheries in the state, both east and west coast. There was also a cold water event that started near West Palm Beach in 2003, which moved up the east coast causing a substantial decline in snapper grouper fishing that year. The continental shelf is much narrower in Florida than elsewhere in the region, allowing fishermen to access deep waters quickly and return the same day. Finally, the species of snapper grouper available to fishermen in southern Florida are different than further north, with yellowtail snapper, gag and black grouper, and other alternative species such as stone crab, spiny lobster, dolphin, kingfish, and billfish allowing a greater variety of both commercial and recreational fishing opportunities. These fisheries are important to many Florida communities identified by the Snapper Grouper Advisory Panel as shown in Figure 3-17.

Commercial Sector

Considering the high population growth rates and emphasis on a tourism economy in Florida, the commercial fishing sector in Florida is still robust in some areas. Although total landings and dollar values of all species landed on the Florida East coast have decreased from 1998 to 2003 (from nearly 30 million pounds worth approximately $44 million to approximately 23 million pounds worth $33 million dollars; SAFMC 2006), there is still a considerable commercial fishing presence in east Florida.

The table below (Table 3-58) shows the cumulative landings for 2005, 2006, and 2007 for the top three communities in Florida for each species in this amendment. Although, the rankings can change from year to year, the cumulative landings over a three year range can suggest which communities are most involved with the commercial harvest of each species.

Table 3-58. Cumulative landings (2005-2007) for the top three communities in Florida for each species in this amendment.

Species	Location	Pounds	Location	Pounds	Location	Pounds
Gag	Mayport	319,605	Cocoa	265,628	Jacksonville Beach	220,562
Vermillion Snapper	Mayport	833,254	St. Augustine	294,860	Atlantic Beach	124,688
Black Sea Bass	Jacksonville	6,765	Fernandina Beach	6,541	Mayport	5,524
Snowy Grouper	Key West	269,315	Pt. Orange	195,872	Tavernier	114,877
Golden tilefish	Cocoa	1,109,657	Ft. Pierce	933,150	Pt. Orange	678,863
Black grouper	Key West	951,205	Key Largo	142,787	Summerland Key	142,634
Red grouper	Tavernier	86,261	Summerland Key	75,632	Miami	62,579
Warsaw grouper	Key West	22,781	Cocoa	3,525	Tavernier	2,110
Speckled hind	Key west	77,614	Cocoa	2,528	Tavernier	847

Source: Logbook data, SEFSC 2009.

Recreational Sector

While the commercial fishing industry, though still strong, may be in decline, the recreational sector appears to be stable. Excluding the headboat sector, although the number of participants declined in 2004 to approximately 1.9 million from 2.2 million in 2003 and from a high of 2.6 million in 2001, the number of trips taken in 2003 and 2004 remained at approximately 21 million. In 2004, many homeports hosted at least one vessel holding both federal charter/headboat permits and federal unlimited commercial permits. Key West and Miami stand out, with 35 and 15 such vessels, respectively.

3.8.3.4.2 Cape Canaveral, Brevard County

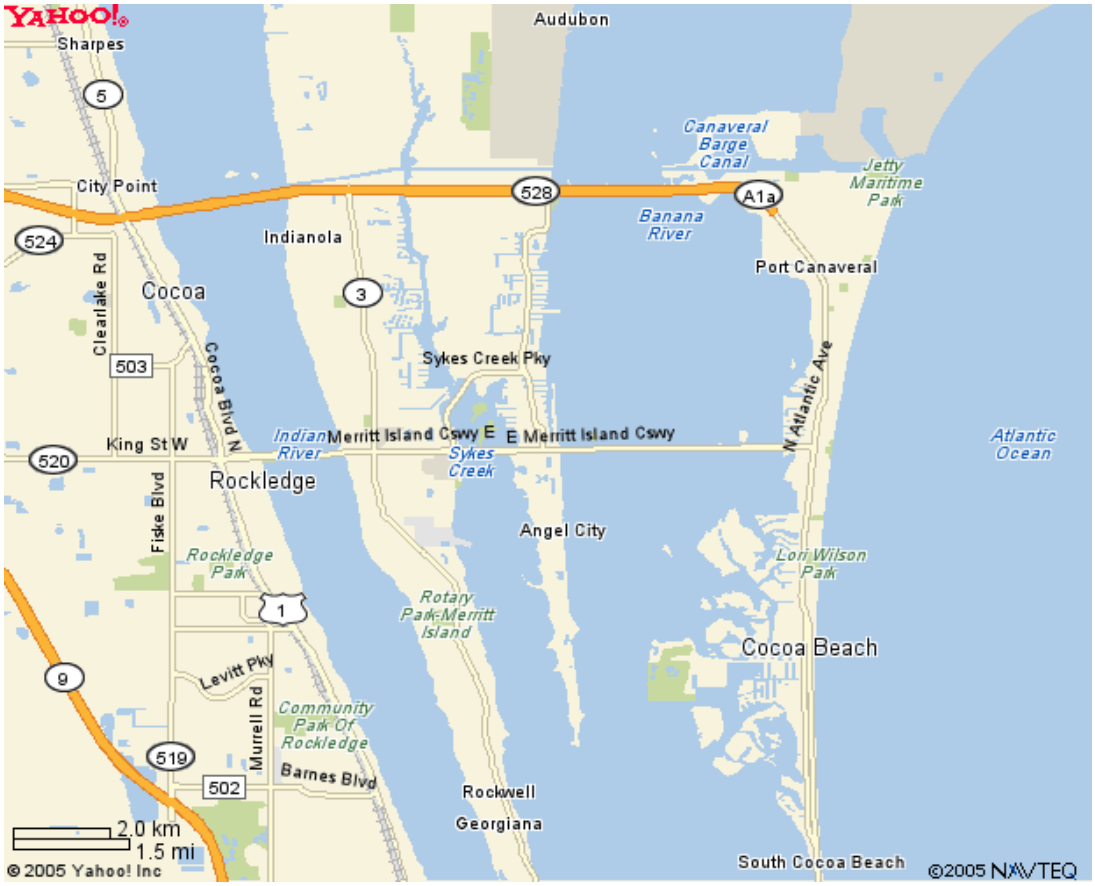


Figure 3-18. Area map of Cape Canaveral, Florida.
Source: Yahoo Maps, http://www.yahoo.com.

A detailed history of Cape Canaveral, Florida, from its first habitation 10,000 years ago, its settlement by the United States in the early 1800s, the establishment of the Banana River Naval Air Station in World War II, to NASA's arrival in 1952, can be found in SAFMC (2006). A map of the area is shown in Figure 3-18.

Overview

Cape Canaveral has a fairly homogenous, aging population, with those 65 years and older growing from 16.1% of the population to 23.1% since 1990. Overall, educational attainment has increased. The number of persons who speak a language other than English at home has increased 2.5%, and fewer people have incomes below the poverty line. Unemployment has decreased, but fewer people are in the labor force today than in

1990, perhaps due to an aging population. The percentage of persons in a service occupation has grown from 14.1% to 20.4%, while there has been a sizeable decline in the percent of residents employed in forestry, mining, and fishing, from 2.7 % in 1990 to 0.4% in 2000.

Fisheries in central Florida generally operate in two different environments, inshore river or inlet fishing with associated lagoons, which primarily attracts recreational fishing, and offshore areas, where commercial fishing primarily occurs. Popular inshore areas include the Indian, St. Johns, and Banana Rivers and associated lagoons. Commercial exploitation of the rivers and lagoons declined after implementation of the Florida net ban of 1994.

Many commercial fish houses have gone out of business or have shifted to selling imported products to supplement their local supplies. At the same time, the number of businesses possessing federal dealer permits has increased from about 180 in 1999 to a little over 200 in 2001. There is some industry speculation that the increasing number of dealer permits reflects increased decentralization in the domestic fishing markets and the need to increase profits by self-marketing.

Commercial Fishing

Cape Canaveral draws fishermen from Cocoa/Cocoa Beach, Merritt Island, Melbourne, and Titusville. These fishermen target many snapper grouper species, as well as coastal migratory pelagics such as mackerel, highly migratory species such as sharks and swordfish, and shellfish such as oysters, quahogs, and shrimp. Snowy grouper and tilefish (particularly golden or sand tilefish) landings exceed 10,000 pounds per year. Total commercial landings decreased, however, from 8.9 million pounds to 6.0 million pounds from 1998 to 2004 (SAFMC 2006).

The number of unlimited commercial permits in this area increased from nine in 1999 to 16 in 2004. The number of limited commercial permits fluctuated over this period, but ultimately declined from four permits in 1999 to one in 2004 (SAFMC 2006).

The number of Florida Saltwater Products Licenses issued to residents of Brevard County (where Cape Canaveral is located) decreased from 872 in 1998/99 to 492 in 2004/05 (SAFMC 2006). This license is needed to sell marine species in the state. There have also been declines in license sales for various crustacean fisheries.

Recreational Fishing

In 2004, Brevard county supported 36 bait and tackle stores, with five in Cape Canaveral, and 70 marinas with over 3,000 wet slips, indicating the importance of recreational fishing to the area. Fourteen fishing tournaments consistently occur in the area. Additional details about these businesses and tournaments can be found in SAFMC (2006).

As in other coastal areas of Florida, there is a fairly heavy presence in Brevard County of charter boat businesses, private marinas, and other associated businesses catering to the recreational fishing sector. The number of federally permitted charter/headboat vessels in Cape Canaveral increased from zero to seven from 1999 to 2004. According to Holland *et al.* (1999), there were approximately 32 charter boats and 2 headboats in the Canaveral/Melbourne area. Current estimates from permit files show at least 38 for-hire vessels with snapper grouper permits homeported in Cape Canaveral or Port Canaveral, which includes approximate four headboats. That is likely a low estimate for total the total number of for-hire vessels in the area since it does not include vessels in the nearby Merritt Island and in the Cocoa/Cocoa Beach areas.

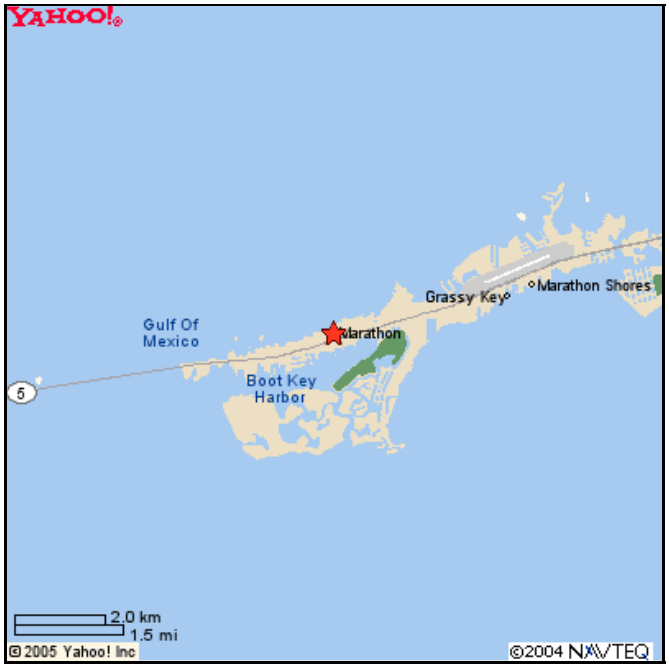


Figure 3-19. Marathon, Florida.
Source: Yahoo Maps, http://www.yahoo.com.

3.8.3.4.3 Marathon, Monroe County

A history of Marathon, detailing its settlement in the 1800s, the rise of industry, the effects of the Great Hurricane of 1935, the rise of tourism, and the importance of commercial fishing, can be found in SAFMC (2006). A map of Marathon, which lies in Monroe County, is shown in Figure 3-19.

Overview

Census data from 1990 and 2000 show there was an increase in overall population in Marathon from 8,857 in 1990 to 10,255 in 2000. During this period, the Hispanic population more than doubled, increasing from 1,040 to 2,095. This increase accounts for more than two thirds of the total population increase for the area. During this period

of time, the median household income increased from approximately $25,000 to over $36,000.

Marathon has maintained a relatively high percentage of the total population, 4.1% in 2000, involved in farming, fishing, and forestry, though the percentage has declined from 8.7% in 1990. Since there is little commercial farming and forestry occurring in the area, the majority of percentage can be assumed to relate to fishing activities. The percentage of people that live below the poverty line decreased slightly from 15.1% in 1990 to 14.2% in 2000.

Commercial Fishing

In 1998, 184 Marathon residents were employed in fishing related industry according to the Census data, with 39 of those in the "fishing" category, 92 employed in "fish and seafood," and 47 employed by marinas (SAFMC 2006). The number of unlimited commercial permits held by community residents decreased from 65 permits to 44 permits between 1999 and 2004. Similarly, the number of limited commercial permits decreased from 43 permits to 31 permits.

Recreational Fishing

While most of the waters around Marathon are open to fishing, some areas have been set aside for eco-tourism and fish-viewing by divers and snorkelers. Sombrero Reef, said to be one of the most beautiful sections of North America's only living coral barrier reef, lies several miles offshore and is protected by the Florida Keys National Marine Sanctuary (http://www.fla-keys.com/marathon).

The importance of recreational boating and fishing to the economy of Marathon is shown by the businesses reliant upon it. As of 2004, there were at least 25 charter boat businesses, two party boat businesses, eight bait and tackle shops, and 27 marinas in the area. The number of vessels holding the federal charter/headboat permit increased from 16 in 1999 to 30 in 2004. In addition, there were seven fishing tournaments in Marathon. Most tournaments are centered on tarpon fishing. However, there are inshore and offshore fishing tournaments as well. These tournaments begin in February and run through June. Hotels and restaurants fill with participants and charters, guides and bait shops reap the economic benefits of these people coming to the area. These tournaments are positive economic pulses in the local economy, one that thrives on the existence of tourism and recreational fishing.

4 Environmental Consequences

Revisions to the Magnuson-Stevens Act in 2006 require that by 2010, Fishery Management Plans (FMPs) for fisheries determined by the Secretary to be subject to overfishing must establish a mechanism for specifying Annual Catch Limits (ACLs) at a level that prevents overfishing and does not exceed the recommendations of the respective Council's Scientific and Statistical Committee (SSC) or other established peer review processes. These FMPs must also establish, within this time frame, measures to ensure accountability. By 2011, FMPs for all other fisheries, except fisheries for species with annual life cycles, must meet these requirements.

NMFS guidelines define the following terms:

- Overfishing limit (OFL) means "the annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish.

- Acceptable biological catch (ABC) means "a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and should be specified based on the ABC control rule.

- ACL means "the level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures." Setting the ACL provides an opportunity to divide the total ACL into sector-specific ACLs.

- Annual catch target (ACT) means "an amount of annual catch of a stock or stock complex that is the management target of the fishery. NMFS guidelines indicate that specifying an ACT is optional and up to the discretion of the Council. A stock or stock complex's ACT should usually be less than its ACL and results from the application of the ACT control rule. If sector-ACLs have been established, each one should have a corresponding sector-ACT."

- Catch is the total quantity of fish, measured in weight or numbers of fish, taken in commercial, recreational, subsistence, tribal, and other fisheries. Catch includes fish that are retained for any purpose, as well as mortality of fish that are discarded.

- Accountability measures (AMs) means "management controls that prevent ACLs or sector-ACLs from being exceeded (in-season AMs), where possible, and correct or mitigate overages if they occur."

ABC Recommendations

For stock and stock complexes required to have an ABC, NOAA Fisheries Service final guidelines recommend that each Council should establish an ABC control rule based on scientific advice from its Scientific and Statistical Committee (SSC). The SSC provided OFL and ABC recommendations in terms of pounds of fish at their June 2008 meeting but the SSC did not have an ABC control rule to assist them with estimating ABC and indicated that they considered the values to be "interim" until more robust methods for estimating these parameters could be made available. At their December 2008 meeting, the SSC considered advice from the proposed NS1 guidelines and rescinded all estimates of ABC with the exception of an ABC = 0 landings for speckled hind and warsaw grouper. Furthermore, the SSC recommended at their December 2008 meeting that the ABC levels for snowy grouper, black sea bass, and red snapper be set consistent with the rebuilding plans for those species until they can be further amended with better scientific information.

The SSC met in March and June 2009 to identify a protocol for determining ABCs, which will be included in the Comprehensive ACL amendment. At their June 2009 meeting, the SSC provided ABC recommendations for gag and vermilion snapper. For gag, the ABC for 2010 includes 805,000 pounds for landings and 18,000 fish for dead discards, corresponding to a P* = 0.30 from "A probability-based approach to setting annual catch limits: Gag, *Mycteroperca microlepis*, off the Southeastern United States (Shertzer 2008). The SEFSC provided an ABC for gag that includes landed catch and discards; this total ABC value is 805,000 pounds gutted weight for landings; 80,000 pounds gutted weight for dead discards, and 885,000 pounds gutted weight inclusive of landings and discards. For vermilion snapper, the SSC recommended ABC levels interpolated from Tables 3-19 and 3-20 of the Southeast Data Assessment and Review (SEDAR) vermilion assessment workshop report to obtain the P* value of 0.275. For 2010 this corresponds to 1,078,000 pounds whole weight for landings, 31,000 pounds whole weight for dead discards, and 1,109,000 pounds whole weight inclusive of landings and discards (SEDAR Update #3 2007). The ABCs for landed catch for gag and vermilion snapper assumes the current level of discards would continue. The SSC stated at their March 2009 meeting that it does not support ABCs and ACLs that require the monitoring of discards.

The SSC recommended waiting for the results of the stock assessments for both black grouper and red grouper to determine ABC values for those species. The SSC did not provide an ABC value for golden tilefish because of the age of the assessment and lack of a current estimate of abundance.

Table 4-1. Values for Overfishing Level (OFL) and Acceptable Biological Catch (ABC) recommendations from the SSC.

Species	OFL	ABC
Black grouper[1]	none specified	none specified
Black sea bass	OFL = Yield at MFMT	ABC = rebuilding plan[2] 847,000 lbs ww 717,797 lbs gw
Gag[1]	OFL = Yield at MFMT	805,000 lbs gw (landed catch)[3] 885,000 lbs gw (total kill)
Golden tilefish[1]	none specified	none specified
Red grouper[1]	none specified	none specified
Snowy grouper	OFL = Yield at MFMT	ABC = rebuilding plan[4] 102,960 lbs ww 87,254 lbs gw
Speckled hind[5]	SSC Recommendation=Unknown	0 (landings only)
Vermilion snapper[6]	none specified	1,078,000 lbs ww (landed catch)[6] 1,109,000 lbs ww (total kill)
Warsaw grouper[5]	SSC Recommendation=Unknown	0 (landings only)

1. At their June 2008 meeting, the SSC withdrew OFL and ABC levels for black grouper, gag, golden tilefish, red grouper, and vermilion snapper. The previous recommendations were developed at their June 2007 meeting.
2. At their June 2008 meeting, the SSC recommended that the ABC levels for black sea bass be set consistent with the rebuilding plan until it can be further amended based upon better scientific information. Through Amendment 15A, the Council established a TAC of 847,000 lbs whole weight (717,797 lbs gutted weight) based upon the rebuilding plan. The rebuilding plan was based on a constant catch strategy and set levels equal to the yield at OY in a rebuilding fishery.
3. In December 2007, the SSC motion indicated that the values for gag are ABC=694,000 pounds and OFL=yield at MFMT. In June 2008, the SSC stated that for species assessed through SEDAR, ABC=yield at 75%F_{MSY} and OFL=yield at MFMT. In December 2008, the SSC withdrew the ABC and OFL recommendations for gag established at the June 2008 meeting. The SSC previously specified MFMT for gag in Amendment 16. At their June 2009 meeting, the SSC recommended an ABC = 805,000 pounds gutted weight in landed catch and 80,000 dead discarded fish.
4. At their June 2008 meeting, the SSC recommended that the ABC levels for snowy grouper be set consistent with the rebuilding plan until it can be further amended based upon better scientific information. Through Amendment 15A, the Council established a TAC of 102,960 lbs whole weight (87,254 lbs gutted weight) based upon the rebuilding plan. The rebuilding plan was based on a constant catch strategy and set levels equal to the yield at OY in a rebuilding fishery.
5. At their December 2008 meeting, the SSC recommended an ABC = 0 (landings only) for speckled hind and warsaw grouper.
6. In December 2007, the SSC motion indicated that the values for vermilion snapper are ABC=628,459 pounds and OFL=yield at MFMT. In June 2008, the SSC stated that for species assessed through SEDAR, ABC=yield at 75%F_{MSY} and OFL=yield at MFMT. A new age-based assessment was completed for vermilion snapper in 2008. In December 2008, the SSC withdrew the ABC and OFL recommendations for vermilion established at the June 2008 meeting. The SSC

previously specified MFMT for vermilion snapper in Amendment 16. At their June 2009 meeting, the SSC recommended an ABC = 1,109,000 lbs whole weight inclusive of landings and dead discards. The landed portion of this ABC is 1,078,000 lbs whole weight.

4.1 Speckled hind/warsaw grouper

Alternative 1 (Status Quo). Retain existing regulations for deepwater species (snowy grouper, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper) (Tables 4-2 and 4-3). Do not specify commercial and recreational ACLs, ACTS, or AMs. Existing regulations include: 622.32(4)(c)(3). One speckled hind per vessel per trip included in the 3 grouper aggregate bag limit, and one warsaw grouper per vessel per trip included in the 3 grouper aggregate bag limit. 622.45(d)(4) A warsaw grouper or speckled hind in or from the South Atlantic EEZ may not be sold or purchased.

Table 4-2. Current commercial regulations for deepwater species.

	COMMERCIAL REGULATIONS					
SPECIES	SIZE LIMIT	LIMITED ACCESS	GEAR RESTRICTIONS	ANNUAL QUOTA (gutted weight)	TRIP LIMITS	AREA CLOSURES
Snowy Grouper		√	√	84,000 lbs	100 lbs	√
Golden Tilefish		√	√	295,000 lbs	4,000 lbs until 75% of quota taken; after 75%, trip limit reduced to 300 lbs. Do not adjust trip limit downwards unless percent specified is captured on or before September 1.	√
Blueline Tilefish		√	√			√
Yellowedge Grouper		√	√			√
Warsaw Grouper		√	√		1 per vessel per trip. No sale, trade, or transfer at sea	√
Speckled Hind		√	√		1 per vessel per trip. No sale, trade, or transfer at sea	√
Misty Grouper		√	√			√
Queen Snapper	12" TL	√	√			√
Silk Snapper	12" TL	√	√			√

Table 4-3. Current recreational regulations for deepwater species.

	RECREATIONAL REGULATIONS				
SPECIES	SIZE LIMIT	GEAR RESTRICTIONS	POSSESSION LIMIT	TRIP LIMITS	AREA CLOSURES
Snowy Grouper		√	1 per person per day. Included in 3 grouper per person per day.		√
Golden Tilefish		√	1 per person per day. Included in 3 grouper per person per day.		√
Blueline Tilefish		√	Included in 3 grouper per person per day.		√
Yellowedge Grouper		√	Included in 3 grouper per person per day.		√
Warsaw Grouper		√	Included in 3 grouper per person per day.	1 per vessel per trip. No sale, trade, or transfer at sea	√
Speckled Hind		√	Included in 3 grouper per person per day.	1 per vessel per trip. No sale, trade, or transfer at sea	√
Misty Grouper		√	Included in 3 grouper per person per day.		√
Queen Snapper	12" TL	√	Included in 10 snapper per person per day.		√
Silk Snapper	12" TL	√	Included in 10 snapper per person per day.		√

Alternative 2. Establish an ACL = 0 (landed catch only) for speckled hind and warsaw grouper. Prohibit all commercial and recreational fishing for, possession, and retention of speckled hind and warsaw grouper.

Alternative 3. Establish an ACL = 0 (landed catch only) for speckled hind and warsaw grouper. Prohibit all commercial and recreational fishing for, possession, and retention of speckled hind and warsaw grouper as well as other deepwater species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper).

Alternative 4 (Preferred). Establish an ACL = 0 (landed catch only) for speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of other deepwater snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) beyond a depth of 240 feet (40 fathoms; 73 m).

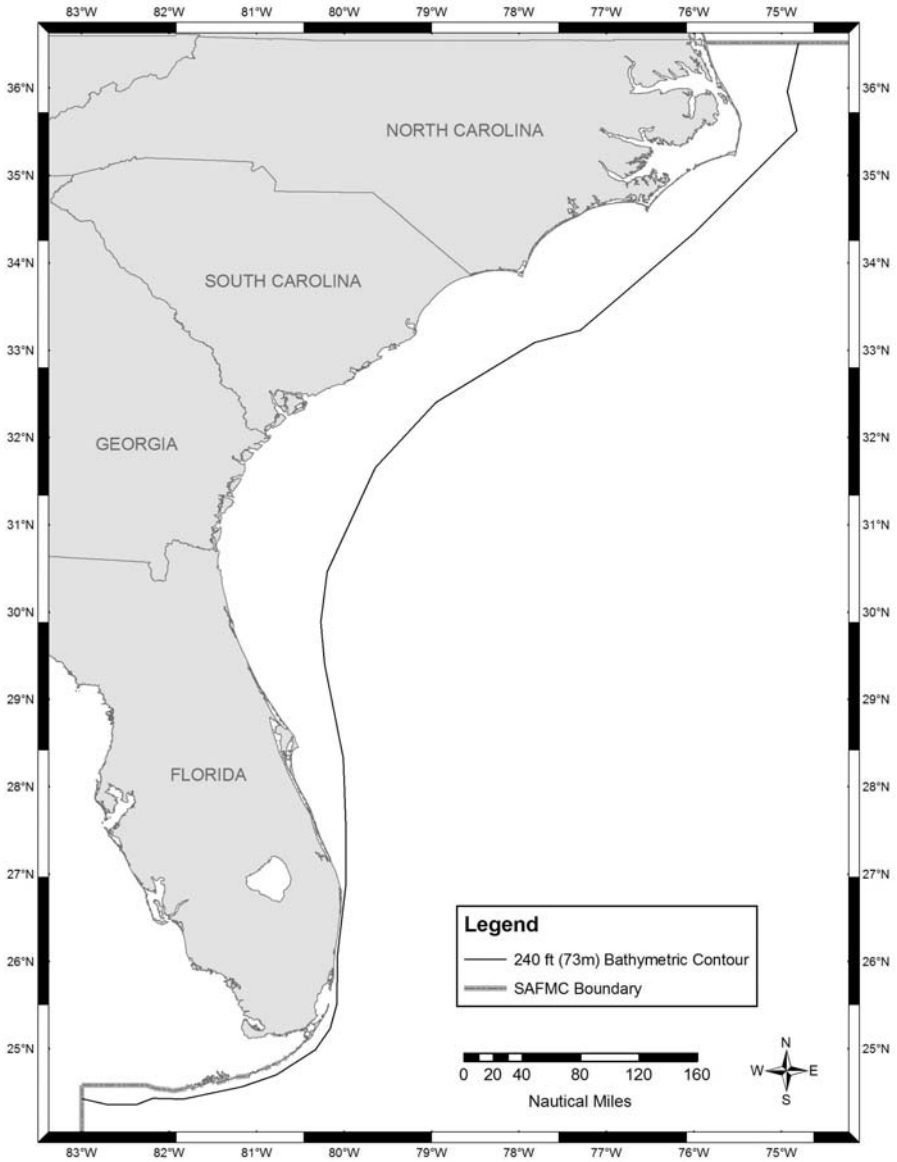


Figure 4-1. Generalized 240 ft. depth contour line see Table 4-4 for waypoints used in this boundary.

Table 4-4. Waypoints used to delineate generalized 240 ft. boundary.

Point	Latitude N (Degrees Minutes Seconds)	Longitude W (Degrees Minutes Seconds)
1	36°31'01"	74°48'10"
2	35°57'29"	74°55'49"
3	35°30'49"	74°49'17"
4	34°19'41"	76°00'21"
5	33°13'31"	77°17'50"
6	33°05'13"	77°49'24"
7	32°24'03"	78°57'03"
8	31°39'04"	79°38'46"
9	30°27'33"	80°11'39"
10	29°53'21"	80°16'01"
11	29°24'03"	80°13'28"
12	28°19'29"	80°00'27"
13	27°32'05"	79°58'49"
14	26°52'45"	79°58'49"
15	26°03'36"	80°04'33"
16	25°31'03"	80°04'55"
17	25°13'44"	80°09'40"
18	24°59'09"	80°19'51"
19	24°42'06"	80°46'38"
20	24°33'53"	81°10'23"
21	24°25'20"	81°50'25"
22	24°25'49"	82°11'17"
23	24°21'35"	82°22'32"
24	24°21'29"	82°42'33"
25	24°25'37"	83°00'00"

Alternative 5. Establish an ACL = 0 (landed catch only) for speckled hind and warsaw grouper, and prohibit all fishing for, possession, and retention of speckled hind and warsaw grouper. Prohibit all fishing for, possession and retention of other deepwater snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper) beyond a depth of 300 feet (50 fathoms; 92 m).

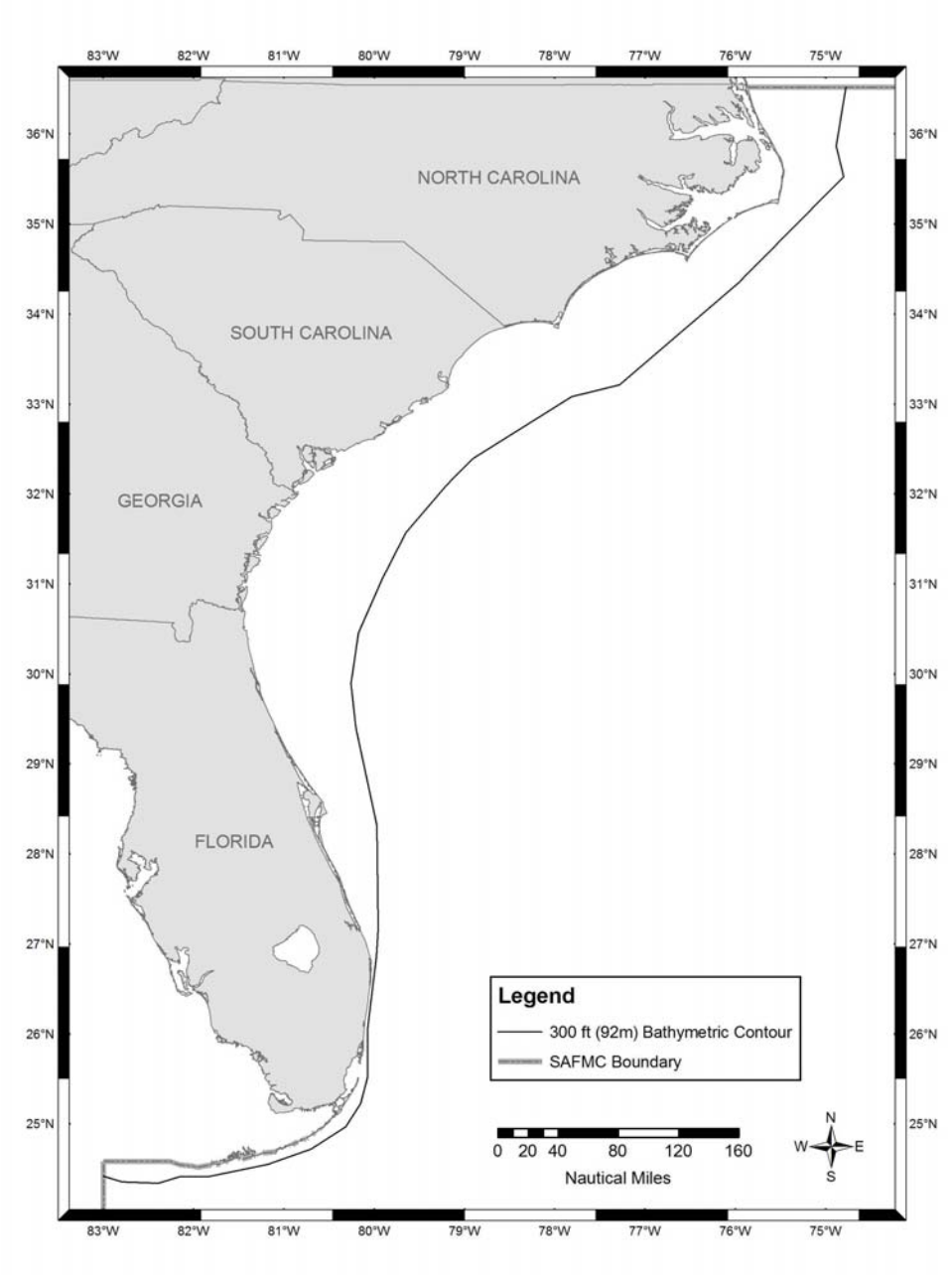


Figure 4-2. Map of generalized 50 fathom depth contour.

Table 4-5. Waypoints used to delineate generalized 300 ft depth contour line.

Point	Latitude N (Degrees Minutes Seconds)	Longitude W (Degrees Minutes Seconds)
1	36°31'01"	74°46'21"
2	35°51'59"	74°52'52"
3	35°31'36"	74°47'57"
4	34°20'35"	75°57'53"
5	33°12'48"	77°16'60"
6	33°04'48"	77°48'37"
7	32°23'28"	78°54'32"
8	32°06'03"	79°11'41"
9	31°34'08"	79°38'57"
10	31°03'17"	79°54'37"
11	30°27'19"	80°10'34"
12	29°53'31"	80°15'25"
13	29°24'24"	80°12'13"
14	28°18'51"	79°58'12"
15	27°10'16"	79°57'23"
16	26°51'22"	79°58'25"
17	26°03'30"	80°04'19"
18	25°31'19"	80°04'28"
19	25°13'28"	80°09'02"
20	24°57'56"	80°18'48"
21	24°43'11"	80°41'59"
22	24°33'04"	81°10'52"
23	24°24'50"	81°50'05"
24	24°24'50"	82°09'16"
25	24°20'29"	82°23'23"
26	24°21'15"	82°47'46"
27	24°24'55"	83°00'00"

4.1.1 Biological Effects

Alternative 1 (Status Quo) would retain existing regulations for speckled hind and warsaw grouper. These regulations include: A 1 fish per vessel per trip limit for the recreational and commercial sectors within the 3 grouper per person per day aggregate bag limit; and a prohibition on the sale, trade, or transfer at sea. Effective July 29, 2009, Snapper Grouper Amendment 16 (74 FR 30964; SAFMC 2008c)) reduced the grouper aggregate bag limit from 5 fish per person per day to 3 fish per person per day. The 2008 Report to Congress on the Status of U.S. Fisheries indicates speckled hind and warsaw grouper are experiencing overfishing but the overfished status is unknown.

Warsaw grouper and speckled hind are extremely vulnerable to overfishing because they are slow growing, long-lived, and change sex from female to male with increasing size and age. Furthermore, speckled hind is believed to form spawning aggregations, which

can increase its vulnerability to fishing pressure. Assessment information is dated for both species. Warsaw grouper was assessed by catch curve analysis using data from 1988 and 1990 (Huntsman *et al.* 1992). Static SPR values for warsaw grouper were 0.2% and 6% for 1988 and 1990 fishing years, respectively. Speckled hind was assessed for the 1988, 1990, 1996, and 1999 fishing years (NMFS 1991; Huntsman *et al.* 1992; Potts and Brennan 2001). SPR values were 25%, 12%, 8%, and 5% for 1988, 1990, 1996, and 1999 fishing years, respectively. A study conducted by Ziskin (2008) indicated that total mortality and fishing mortality of speckled hind had increased since 1977-1993 suggesting that speckled hind continues to be overexploited, despite the 1994 regulation, and may not be reproductively resilient enough to recover from depressed population levels. Speckled hind and warsaw grouper are scheduled for SEDAR assessments in 2012.

No directed harvest of these species would be allowed under **Alternatives 2-5**, which specify an ACL of zero based on landed catch. Therefore, any mortality attributable to fishing activity, regardless of sector, would take the form of discard mortality. The SSC indicated at their March 2009 meeting, that it did not support ACLs for speckled hind and warsaw grouper that require monitoring of discards. Under the existing discard logbook program, discards are self reported and involve a high degree of uncertainty. The SSC was concerned that many fishermen may not accurately report or under-report speckled hind and warsaw grouper discards for fear of triggering an AM when an ACL based on discards was met. Setting the ACL at zero would prohibit all directed harvest and eliminate the need to track discards in order to implement an AM. Establishing an ACL of zero creates an implied AM in the form of a seasonal closure. By not allowing any directed harvest the season is considered closed year-round. Furthermore, creating an ACL of zero is in essence establishing the most conservative catch limit possible, which by default, establishes an AM whereby no directed harvest of the species is allowed.

Discard mortality can limit the effectiveness of management measures such as ACL = zero landings, limited access systems, trip limits, and minimum size limits, if fishermen catch and discard speckled hind and warsaw grouper when targeting co-occurring species. The snapper grouper ecosystem includes many species, which occupy the same habitat at the same time. While speckled hind and warsaw grouper are considered to be deepwater species, they occupy a broad depth zone and commonly co-occur with mid-shelf species such as vermilion snapper and gag as young fish. Warsaw grouper is usually found at depths from 55 to 525 m (180-1,722 ft) (Heemstra and Randall 1993) and juveniles are sometimes observed in inshore waters (Robins and Ray 1986), on jetties and shallow reefs. The speckled hind is found in depths from 25 m (98 ft) (Heemstra and Randall 1993) to 400 m (1,312 ft) (Bullock and Smith 1991) and juveniles commonly occur in shallower waters. Therefore, while speckled hind and warsaw grouper are not often targeted due to regulations, they are likely to be caught and suffer some mortality when regulated since they will be incidentally caught when fishermen target other co-occurring species. This incidental catch of speckled hind and warsaw grouper may be responsible for continued overfishing of these species. At their June 2008 meeting, the SSC recommended an ABC equal to 0 for speckled hind and warsaw grouper. The SSC

indicated the ABC equal to 0 refers to harvest and not total removals (December 2008 SSC Report).

Alternative 2 would prohibit all fishing for, possession, and retention of speckled hind and warsaw grouper. This alternative would have a greater biological effect than **Alternative 1 (Status Quo)** if there is some targeting of these species. However, if all catch of speckled hind and warsaw grouper is incidental to targeting co-occurring species, then the biological effect would be similar to **Alternative 1 (Status Quo)** with the exception that the magnitude of discards would be increased (Table 4-6). Since most speckled hind and warsaw grouper are generally caught at depths of 160 feet (49 m) and greater, the release mortality would be expected to be high. McGovern *et al.* (2005) estimated release mortality rates of about 50% for gag caught at depths of 50 m (164 feet; Figure 4-3). The relationship between depth and mortality has not been specified for speckled hind and warsaw grouper. However, if depth related release mortality of speckled hind and warsaw grouper is similar to gag, some survival of speckled hind and warsaw grouper discarded in shallower depths would be expected. Thus, a requirement for fishermen to discard all speckled hind and warsaw grouper would be expected to reduce fishing mortality.

Table 4-6. Magnitude of discards under Alternatives 2-4 relative to the number of discards under status quo Alternative 1. Status quo represents average number of discards from commercial, headboat, and MRFSS during 2005-2008.

Estimated Level of Discards	Status Quo	Alt 2	Alt 3	Alt 4	Alt 5
Snowy Grouper	1,447	ND	---	--	--
Blueline Tilefish	5,107	ND	---	--	--
Yellowedge Grouper	18	ND	---	--	--
Warsaw Grouper	80	+	---	--	--
Speckled Hind	3,627	+	---	--	--
Misty Grouper	0	ND	ND	ND	ND
Queen Snapper	2	ND	ND	ND	ND
Silk Snapper	530	ND	---	--	--

(+) increased discards; (-) reduced discards; (--) significantly reduced discards; (---) largest reduction in discards; (ND) no difference in magnitude of discards.

Alternative 3 would prohibit all fishing for, possession, and retention of deepwater species including snowy grouper, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper. During 2005-2008, commercial and recreational landings of blueline tilefish were highest among the species considered in **Alternative 3** and **Alternative 4 (Preferred)**. Second in abundance was snowy grouper, which had restrictions imposed through Snapper Grouper Amendment 13C limiting the commercial trip to 100 lbs gutted weight with a 84,000 pound gutted weight commercial quota and restricting the bag limit to 1 fish per person within the grouper aggregate. In comparison, catches of the remaining species were small (Table 4-7).

Table 4-7. Average landings (pounds whole weight) of snowy grouper, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, golden tilefish, blueline tilefish, queen snapper, and silk snapper during 2005-2008.

Species	Commercial	Headboat	Charter Boat	Other Rec
SNOWY GROUPER	193,962	671	59,642	470
YELLOWEDGE GROUPER	52,063	30	428	0
WARSAW GROUPER	2,267	1,034	2,285	7,922
SPECKLED HIND	15,765	1,207	1,283	470
MISTY GROUPER	1,697	1	0	0
BLUELINE TILEFISH	207,169	513	179,644	88,635
QUEEN SNAPPER	6,444	0	0	352
SILK SNAPPER	24,207	2,131	399	263

Analysis of logbook data indicates shallow water groupers such as red grouper and gag as well as deepwater species like snowy grouper, yellowedge grouper, speckled hind, and blueline tilefish were taken on commercial trips with warsaw grouper during 2005-2008 (Table 4-8a). In contrast, mid-shelf species such as vermilion snapper, scamp, red grouper, black grouper, and gag were much more commonly taken on commercial trips with speckled hind than deepwater species (Table 4-8b). Due to this co-occurrence of deepwater species with mid-shelf species, some discards of deepwater species would be expected under **Alternative 3**. However, of the alternatives considered, **Alternative 3** would provide the greatest reduction in the magnitude of discarded speckled hind and warsaw grouper.

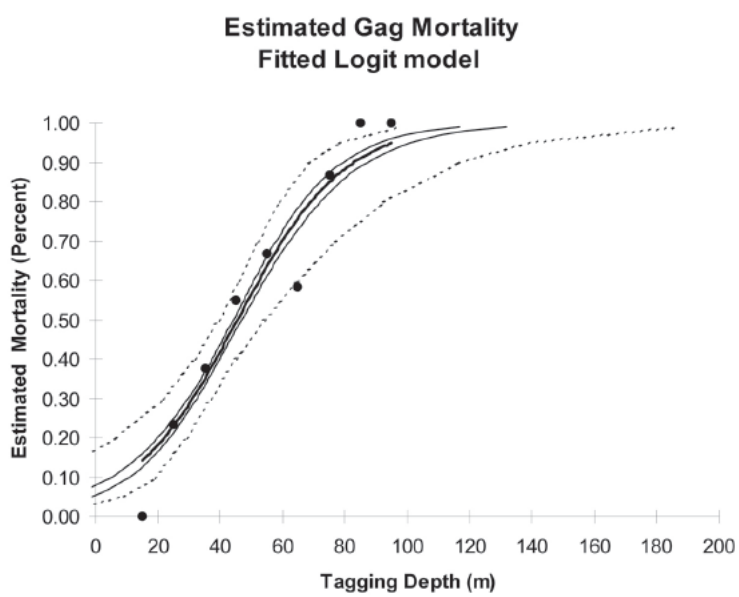


Figure 4-3. Logit analysis of gag recapture rate with depth showing estimated depth-related mortality (thick line) as well as 95% (thin lines) and 99% (dashed lines) confidence intervals.
Source: Figure 3 from McGovern *et al.* (2005).

In the recreational sector, deepwater species were very rarely taken on trips when either warsaw grouper or speckled hind were caught (Tables 4-8c to 4-8f). Currently, prohibiting possession of all deepwater species might not provide much reduction in incidental catch of warsaw grouper and speckled hind, particularly in the recreational sector because most speckled hind and warsaw grouper are taken as juveniles in the shallow part of their depth range. Measures to limit catch of mid-shelf species would be more likely to have a greater biological benefit in reducing mortality of warsaw grouper and speckled hind. However, as biomass of speckled hind and warsaw grouper is likely depressed, older fish, which would be found in deeper water, are probably uncommon. As populations of speckled hind and warsaw grouper recover and older fish become more established, a greater co-occurrence of these species with other deepwater species like snowy grouper and blueline tilefish would be expected.

At their June 2009 meeting, the Council decided not to include golden tilefish in the list of deepwater species that would be affected under **Alternative 3-5** because golden tilefish are usually caught over mud habitat in depths of 180 m to 300 m, (Low *et al.* 1983; Able *et al.* 1993), with depths of ~200 m being most common (Dooley 1978). Speckled hind and warsaw grouper prefer rocky habitats and are not found over mud (Heemstra and Randall 1993). Examination of logbook and MRFSS data indicates warsaw grouper and speckled hind were very rarely taken on trips with golden tilefish during 2005-2008 (Tables 4-9a and 4-9b). However, because sale of warsaw grouper and speckled hind is prohibited, logbook data might not accurately reflect the actual catch of these species.

Longline gear is sometimes set over rocky bottom in 180 m to 300 m where snowy grouper, blueline tilefish, and blackbelly rosefish are caught. On these sets, golden tilefish are also caught in areas where longline gear crosses over mud habitat. While few speckled hind and warsaw grouper are taken on trips with golden tilefish, there is a chance these species could occur when fishing gear is set over rocky habitat and mud. However, it is likely fishermen can avoid these areas when targeting golden tilefish. Low *et al.* (1983) identified areas of strictly mud habitat off of South Carolina and Georgia where golden tilefish occur (Figure 4-4). Sampling conducted by the Marine Resources Monitoring Assessment and Prediction (MARMAP) program in mud habitat identified by Low *et al.* (1983) has never yielded any speckled hind or warsaw grouper (unpublished MARMAP cruise reports). Able *et al.* (1993) has identified areas of tilefish mud habitat off the east coast of Florida.

Speckled hind and warsaw grouper probably migrate to deeper water as they grow and mature (McGovern *et al*. 2002; McGovern *et al*. 2005). Ziskin (2008) reported there was a positive relationship between depth and length for speckled hind examined during 1977 to 1993. Furthermore, like other grouper species, speckled hind and warsaw grouper change sex from female to male as they age (Ziskin 2008). Both of these biological characteristics make them vulnerable to negative impacts of fishing pressure, such as altering the male-female ratio and elimination of the most fecund members of a stock due to selective removal of the largest individuals. Ziskin (2008) reported a significant decline in the mean age and length from 1977 to 1993 and 2004 to 2007 and suggested

larger and older fish have been removed from the speckled hind population. Therefore, it is necessary to implement management measures focused on protecting older individuals in the population. In doing so, an adequate number of spawning age adults would be available to ensure enough larvae are produced to form healthy juvenile populations in shallower depths. In turn, the population of fish migrating offshore, as they become sexually mature adults, would also increase.

Alternative 4 (Preferred) would prohibit fishing for, possession, and retention of speckled hind and warsaw grouper. It would also prohibit fishing for, possession, and retention of other deepwater species beyond a depth of 40 fathoms (240 feet). This depth contour is described by the waypoints provided in Table 4-4 and is illustrated in Figure 4-1. Closing the area beyond 240 feet **(Alternative 4 Preferred)**, to deepwater snapper grouper fishing, would provide protection to the largest, most fecund fish and ensure a natural sex ratio into the future. Speckled hind are thought to form spawning aggregations, which can be susceptible to targeted fishing pressure (G. Gilmore, Dynamac Corporation, personal communication). Prohibiting all harvest of deepwater snapper grouper species beyond 240 feet would also protect these spawning aggregations, as well as decrease bycatch mortality of speckled hind, warsaw grouper, and other co-occurring deepwater snapper grouper species. The biological effects of **Alternative 5** would be very similar to those under **Alternative 4 (Preferred)**. However, under **Alternative 5** the prohibition on fishing for deepwater species and associated protections would be pushed out to 300 ft. Overall biological benefits would be slightly less under **Alternative 5** when compared to the preferred alternative.

At their December 2009 meeting, the SSC expressed concern that regulatory discards of speckled hind and warsaw grouper inside of the 240 foot depth boundary could affect efforts to end overfishing of these species. As speckled hind and warsaw grouper recover, regulatory discards may increase shoreward of 240 feet where other snapper grouper species may still be caught. However, it should be noted that Amendment 17A, which addresses overfishing of red snapper, includes actions that would close a large area to all snapper grouper fishing in order to protect red snapper. The proposed closed area could be located immediately adjacent to the shoreward boundary of the proposed deepwater snapper grouper closure in this amendment. If Snapper Grouper Amendment 17A is promulgated through rulemaking, a closed area could help to reduce the magnitude of regulatory discards of speckled hind and warsaw grouper. In the absence of Amendment 17A, regulatory discards could continue to contribute to bycatch mortality of speckled hind and warsaw grouper; however, the degree to which those discards would affect rebuilding progress in unknown.

Blueline tilefish dominated the commercial and recreational landings of the deepwater species being considered under **Alternative 3**, **Alternative 4 (Preferred),** and **Alternative 5** during 2005 to 2008. If the Council had chosen to have **Alternatives 3-5** apply to all deepwater species except blueline tilefish and golden tilefish, discards of other deepwater species, particularly snowy grouper, would be expected to occur. Table 4-10a indicates that snowy grouper and yellowedge grouper were taken on 77% and 16% of commercial trips, respectively, when at least one pound of blueline tilefish or golden

tilefish was taken. Other deepwater species including speckled hind, silk snapper, queen snapper, misty grouper, and warsaw grouper were also caught but less frequently than snowy grouper. Snowy grouper and yellowedge grouper were taken on 32% and 11% of commercial trips, respectively, when at least one pound of golden tilefish was caught (Table 4-9a). Other deepwater species were infrequently taken on trips with golden tilefish.

Snowy grouper was the most common species taken on commercial trips when at least one pound of blueline tilefish was taken (66% of commercial trips; Table 4-10b). Other deepwater species were more frequently taken on trips with blueline tilefish than golden tilefish (Table 4-10b). Snowy grouper were very commonly taken on trips with blueline tilefish regardless of state landed (Table 4-10c). Other deepwater species were more commonly taken with blueline tilefish on commercial trips that occurred off of Florida and Georgia (Table 4-10d). Snowy grouper was the only deepwater species taken on recreational trips when at least one blueline tilefish was caught (Tables 10d and 10e).

Analysis indicates **Alternatives 3-5** would likely reduce the incidental catch of deepwater species including warsaw grouper and speckled hind. The biological benefits of these alternatives would likely be realized in the long-term rather than the near-term since inshore fishing would still be allowed, and recreational fishing (typically occurring inshore) accounts for the greatest percentage of overall harvest of speckled hind and warsaw grouper. Perceptible biological benefits may be seen once members of the current juvenile population gets older and migrate to deeper water where they would be protected. **Alternative 4 (Preferred)** would yield less immediate biological benefit than **Alternatives 3** since recreational fishing for juvenile deepwater species in waters shallower than 240 feet would still occur. **Alternative 5** would incur the lowest level of negative socioeconomic impact since fishing for deepwater snapper grouper species in shallower areas would be allowed, and the prohibition on fishing for deepwater snapper-grouper species would occur beyond the depth of 300 feet compared to a depth of 240 feet under **Alternative 4 (Preferred),** while still rebuilding the stocks. The biological benefits of the alternatives analyzed can be ranked in the following order from the lowest level of biological benefit to the highest: **Alternative 1 (Status Quo)**, **Alternative 2**, **Alternative 5, Alternative 4 (Preferred)**, and **Alternative 3**.

If the area seaward of 240 feet is closed to harvest of deepwater snapper grouper species, fishery-dependant data collection for that area may become more difficult and methods to monitor the progress of rebuilding efforts may be highly variable. Large scale research entities such as MARMAP and SEFSC research cruises may gather fishery-independent data while cooperative research programs with academic institutions and headboat surveys could be used to supplement fishery dependant data along with the MRFSS reporting system. Dependent upon funding, more monitoring efforts may be implemented in the future with special emphasis on large closed areas such as the proposed deepwater snapper grouper closure in this amendment.

Alternative 1 (Status Quo) will perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. **Alternatives 2-5** are unlikely to have

adverse affects effects on ESA-listed species, including recently listed *Acropora*. Previous ESA consultations determined the snapper grouper fishery was not likely to adversely affect these species (See **Section 3.5**). These alternatives are unlikely to alter fishing behavior in a way that would cause new adverse affects effects to *Acropora species.* The impacts from **Alternatives 2-5** on sea turtles and smalltooth sawfish are unclear. If establishing an ACL = 0 simply perpetuates the existing amount of fishing effort, but causes an effort redistribution, any potential effort shift is unlikely to change the level of interaction between sea turtles and smalltooth sawfish and the fishery as a whole. If these alternatives reduce the overall amount of fishing effort in the fishery, the risk of interaction between sea turtles and smalltooth sawfish will likely decrease.

Table 4-8a. Species taken on commercial trips during 2005-2008 when at least 1 pound of warsaw grouper was caught.

COMMON	% Trip	% Wt
GROUPER,WARSAW	100.00%	3.46%
SNAPPER,SILK	61.54%	6.20%
TILEFISH,BLUELINE	58.97%	7.15%
GROUPER,SNOWY	58.97%	5.99%
HIND,SPECKLED	53.85%	8.96%
SCAMP	51.28%	3.37%
GROUPER,YELLOWEDGE	46.15%	14.65%
GROUPER,RED	43.59%	16.89%
AMBERJACK,GREATER	41.03%	5.69%
GROUPER,BLACK	35.90%	5.93%
SNAPPER,MUTTON	33.33%	4.03%
SNAPPER,BLACKFIN	30.77%	1.40%
SNAPPER,QUEEN	30.77%	0.82%
TILEFISH	7.69%	2.09%
31 others		13.37%

Table 4-8b. Species taken on commercial trips during 2005-2008 when at least 1 pound of speckled hind was caught during 2004-2006.

COMMON	% Trip	% Wt
HIND,SPECKLED	100.00%	7.02%
SCAMP	70.75%	6.10%
GROUPER,RED	70.29%	13.54%
SNAPPER,VERMILION	66.44%	11.78%
TRIGGERFISH,GRAY	46.71%	2.41%
PORGY,RED,UNC	45.35%	1.17%
GRUNTS	39.91%	2.16%
JACK,ALMACO	37.41%	1.72%
GROUPER,BLACK	33.79%	3.96%
AMBERJACK,GREATER	33.79%	2.93%
SEA BASSE,ATLANTIC,BLACK,UNC	33.33%	0.54%
PORGY,JOLTHEAD	29.25%	0.53%
GROUPER,GAG	28.12%	4.42%
GROUPER,SNOWY	27.89%	5.64%
KING MACKEREL	27.21%	0.97%
DOLPHINFISH	24.72%	0.61%
SNAPPER,RED	23.36%	1.03%
HOGFISH	23.36%	0.50%
TILEFISH,BLUELINE	21.77%	4.32%
GROUPER,YELLOWEDGE	18.82%	13.59%
SNAPPER,MUTTON	18.59%	1.08%
GRUNT,WHITE	16.55%	0.50%
SNAPPER,SILK	15.42%	2.58%
FINFISHES,UNC FOR FOOD	14.51%	0.15%
TRIGGERFISH,OCEAN	12.24%	0.82%
SNAPPER,QUEEN	7.03%	0.38%
TILEFISH	4.76%	2.53%
GROUPER,WARSAW	4.76%	0.45%
59 others		6.57%

Table 4-8c. Species taken on headboat trips during 2005-2008 when at least 1 warsaw grouper was caught.

Species	% Trips	% Number
Warsaw grouper	100.00%	1.13%
Red snapper	71.27%	3.25%
Black sea bass	57.46%	10.88%
Gag	54.14%	0.77%
Gray triggerfish	48.62%	4.94%
Sharpnose shark	46.96%	2.53%
Vermilion snapper	45.30%	29.06%
Gray snapper	39.78%	2.50%
Lane snapper	37.57%	2.11%
King mackerel	35.91%	1.23%
Tomtate	28.73%	4.25%
Scamp	23.76%	1.40%
Cobia	18.23%	0.23%
Red porgy	17.13%	4.91%
Greater amberjack	17.13%	0.64%
Whitebone porgy	16.02%	0.57%
Yellowtail snapper	16.02%	7.87%
Red grouper	16.02%	0.17%
White grunt	16.02%	8.62%
Dolphin	14.92%	0.32%
Mutton snapper	14.36%	2.86%
Little tunny	13.26%	0.40%
Flounder	12.71%	0.32%
Great barracuda	12.71%	0.26%
Snowy grouper	4.97%	0.08%
Silk snapper	3.87%	1.07%
55 others		7.63%

Table 4-8d. Species caught on headboat trips during 2005-2008 when at least 1 speckled hind was caught.

Species	% Trips	% Number
Speckled hind	100.00%	0.60%
Gray triggerfish	76.60%	3.49%
Vermilion snapper	73.26%	50.54%
Scamp	66.02%	2.39%
Red porgy	62.95%	10.44%
Greater Amberjack	55.71%	0.51%
White grunt	54.32%	5.36%
King mackerel	52.92%	0.38%
Knobbed porgy	51.81%	0.96%
Gag	51.25%	0.26%
Tomtate	51.25%	4.97%
Almaco jack	51.25%	1.66%
Sharpnose shark	50.42%	0.57%
Graysby	46.80%	1.44%
Whitebone porgy	44.01%	0.80%
Yellowtail snapper	41.23%	2.26%
Red snapper	38.44%	0.66%
Red grouper	37.33%	0.25%
Black sea bass	36.77%	2.81%
Dolphin	35.65%	0.30%
Squirrelfish	33.70%	0.26%
Banded rudderfish	31.20%	2.79%
Little tunny	30.08%	0.21%
Bigeye	29.25%	0.39%
Gray snapper	24.51%	0.70%
Rock hind	24.51%	0.16%
Great barracuda	23.68%	0.06%
Queen triggerfish	22.28%	0.14%
Cubera snapper	21.73%	0.12%
Cobia	21.73%	0.05%
Remora	20.06%	0.01%
Jolthead porgy	19.78%	0.30%
Mutton snapper	19.22%	0.95%
Lane snapper	13.09%	0.62%
Blue runner	13.09%	0.21%
Black grouper	10.58%	0.04%
Silk snapper	6.69%	0.26%
Snowy grouper	5.85%	0.03%
56 others		2.05%

Table 4-8e. Species taken on MRFSS trips during 2005-2008 when at least 1 warsaw grouper was caught. (Represents sample, not total catch)

species	% Trips	% Number
warsaw grouper	100.00%	7.25%
vermilion snapper	40.00%	35.51%
red snapper	30.00%	7.25%
almaco jack	20.00%	7.25%
gag	20.00%	3.62%
greater amberjack	20.00%	0.72%
red porgy	20.00%	3.62%
scamp	20.00%	0.72%
white grunt	20.00%	2.17%
amberjack genus	10.00%	0.72%
atlantic sharpnose shark	10.00%	0.00%
black sea bass	10.00%	0.72%
blue runner	10.00%	0.72%
dolphin	10.00%	2.90%
gray triggerfish	10.00%	2.17%
king mackerel	10.00%	2.90%
little tunny	10.00%	0.72%
lizardfish family	10.00%	0.00%
mullet genus	10.00%	14.49%
mutton snapper	10.00%	1.45%
queen triggerfish	10.00%	0.72%
rock hind	10.00%	0.72%
snowy grouper	10.00%	0.72%
spottail pinfish	10.00%	2.17%
spotted moray	10.00%	0.00%
yellowedge grouper	10.00%	0.72%

Table 4-8f. Species taken on MRFSS trips during 2005-2008 when at least 1 speckled hind was caught. (Represents sample, not total catch)

species	% Trips	% Number
speckled hind	100.00%	4.42%
vermilion snapper	41.67%	25.87%
red porgy	33.33%	8.83%
gray triggerfish	29.17%	3.79%
yellowtail snapper	29.17%	0.32%
dolphin	20.83%	11.04%
white grunt	20.83%	5.36%
black sea bass	12.50%	3.15%
gag	12.50%	2.21%
king mackerel	8.33%	2.52%
red snapper	8.33%	1.58%
scamp	8.33%	0.63%
spottail pinfish	8.33%	3.47%
almaco jack	4.17%	0.95%
banded rudderfish	4.17%	1.58%
bluefish	4.17%	0.00%
bluestriped grunt	4.17%	0.32%
bulleye	4.17%	0.32%
cobia	4.17%	0.00%
creole-fish	4.17%	0.00%
great barracuda	4.17%	0.32%
herring family	4.17%	9.46%
knobbed porgy	4.17%	0.95%
lane snapper	4.17%	0.00%
leatherjacket family	4.17%	0.00%
little tunny	4.17%	0.00%
margate	4.17%	0.32%
sand tilefish	4.17%	1.58%
sea bass family	4.17%	0.00%
snowy grouper	4.17%	10.73%
spanish mackerel	4.17%	0.32%
unidentified fish	4.17%	0.00%

Table 4-9a. Species taken of commercial trips during 2005-2008 when at least 1 pound of golden tilefish was caught.

COMMON	% Trip	% Wt
TILEFISH	100.00%	65.03%
GROUPER,SNOWY	32.15%	9.69%
TILEFISH,BLUELINE	16.46%	3.82%
DOLPHINFISH	14.87%	0.86%
KING MACKEREL	13.98%	1.37%
GROUPER,YELLOWEDGE	11.33%	2.55%
BLACK BELLIED ROSEFISH	8.44%	4.20%
AMBERJACK,GREATER	6.25%	1.15%
SNAPPER,VERMILION	4.84%	0.92%
HAKE,ATLANTIC,RED & WHITE	4.48%	0.25%
BLUE RUNNER	4.13%	0.06%
SNAPPER,SILK	1.53%	0.19%
HIND,SPECKLED	1.24%	0.28%
SNAPPER,QUEEN	1.18%	0.09%
GROUPER,WARSAW	0.18%	0.02%
GROUPER,MISTY	0.18%	0.00%
78 Others		9.52%

Table 4-9b. Species taken on MRFSS trips during 2005-2008 when at least 1 golden tilefish was caught.

species	% Trips	% Number
tilefish	100.00%	60.04%
black sea bass	45.83%	15.98%
dolphin	25.00%	5.02%
gray triggerfish	8.33%	4.61%
snowy grouper	25.00%	3.89%
spottail pinfish	4.17%	1.54%
vermilion snapper	8.33%	1.43%
king mackerel	20.83%	1.23%
white grunt	4.17%	1.23%
red porgy	8.33%	0.92%
tautog	4.17%	0.82%
silk snapper	4.17%	0.61%
12 Others		2.65%

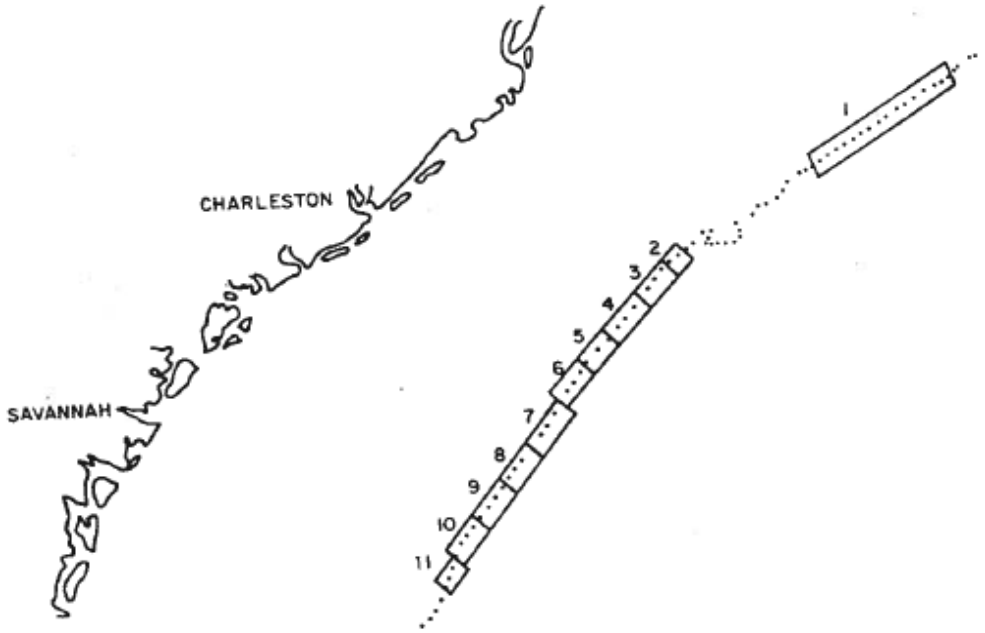


Figure 4-4. Locations off SC and GA where golden tilefish are taken. Areas 2 through 11 represent mud habitat.
Source: Figure 1 from Low *et al.* (1983).

Table 4-10a. Species taken of commercial trips during 2005-2008 when at least 1 pound of blueline tilefish or golden tilefish was caught.

COMMON	% Trip	% Wt
TILEFISH,BLUELINE	100.00%	13.70%
GROUPER,SNOWY	76.84%	9.71%
TILEFISH	58.67%	25.20%
SNAPPER,VERMILION	36.07%	9.04%
DOLPHINFISH	31.57%	1.49%
GROUPER,RED	30.63%	3.13%
SCAMP	30.22%	3.37%
PORGY,RED,UNC	24.65%	0.97%
TRIGGERFISH,GRAY	24.40%	2.29%
AMBERJACK,GREATER	22.74%	2.98%
JACK,ALMACO	22.36%	1.72%
KING MACKEREL	20.60%	1.14%
GROUPER,GAG	20.08%	3.41%
SEA BASSE,ATLANTIC,BLACK,UNC	19.66%	1.22%
SNAPPER,RED	18.17%	0.81%
GROUPER,YELLOWEDGE	16.10%	2.38%
BLACK BELLIED ROSEFISH	11.46%	1.71%
GROUPER,BLACK	10.97%	1.52%
HIND,ROCK	9.10%	0.15%

COMMON	% Trip	% Wt
BARRELFISH	8.97%	0.63%
GRUNTS	8.90%	0.36%
PORGY,JOLTHEAD	8.72%	0.19%
HIND,RED	8.41%	0.09%
SNAPPER,MUTTON	8.20%	0.41%
EELS,UNC	6.51%	0.09%
SNAPPER,YELLOWTAIL	6.47%	0.46%
GRUNT,WHITE	6.47%	0.16%
FINFISHES,UNC FOR FOOD	6.02%	0.19%
SQUIRRELFISHES	5.99%	0.05%
SNAPPER,QUEEN	5.23%	0.25%
BLUEFISH	5.16%	3.65%
BANDED RUDDERFISH	5.16%	0.29%
BLUE RUNNER	5.16%	0.06%
SNAPPER,MANGROVE	5.12%	0.06%
AMBERJACK,LESSER	5.02%	0.28%
COBIA	4.78%	0.10%
SNAPPER,SILK	4.57%	0.61%
HOGFISH	4.36%	0.10%
HAKE,ATLANTIC,RED & WHITE	4.26%	0.11%
BARRACUDA	4.05%	0.07%
MARGATE	4.05%	0.05%
WAHOO	3.46%	0.06%
HIND,SPECKLED	3.39%	0.70%
GROUPER,MISTY	1.42%	0.12%
GROUPER,WARSAW	0.83%	0.06%
96 Others		4.86%

Table 4-10b. Species taken of commercial trips during 2005-2008 when at least 1 pound of blueline tilefish was caught.

COMMON	% Trip	% Wt
TILEFISH,BLUELINE	100.00%	18.15%
GROUPER,SNOWY	66.49%	11.81%
SNAPPER,VERMILION	33.96%	11.79%
GROUPER,RED	29.91%	4.10%
SCAMP	29.73%	4.41%
DOLPHINFISH	25.51%	1.78%
PORGY,RED,UNC	23.78%	1.28%
TRIGGERFISH,GRAY	23.75%	2.96%
JACK,ALMACO	21.56%	2.25%
AMBERJACK,GREATER	20.15%	3.62%
GROUPER,GAG	19.28%	4.42%
SEA BASSE,ATLANTIC,BLACK,UNC	19.11%	1.61%
SNAPPER,RED	17.62%	1.05%
GROUPER,YELLOWEDGE	14.61%	3.08%

COMMON	% Trip	% Wt
KING MACKEREL	13.53%	0.85%
GROUPER,BLACK	10.76%	2.01%
BLACK BELLIED ROSEFISH	10.38%	2.07%
TILEFISH	9.66%	6.86%
HIND,ROCK	9.03%	0.20%
GRUNTS	8.72%	0.48%
PORGY,JOLTHEAD	8.52%	0.24%
BARRELFISH	8.34%	0.78%
HIND,RED	8.20%	0.11%
SNAPPER,MUTTON	7.34%	0.52%
EELS,UNC	6.40%	0.12%
GRUNT,WHITE	6.23%	0.21%
FINFISHES,UNC FOR FOOD	5.88%	0.25%
SNAPPER,YELLOWTAIL	5.85%	0.53%
SQUIRRELFISHES	5.78%	0.06%
SNAPPER,QUEEN	5.09%	0.33%
BLUEFISH	4.95%	4.83%
AMBERJACK,LESSER	4.92%	0.34%
BANDED RUDDERFISH	4.88%	0.38%
SNAPPER,MANGROVE	4.81%	0.08%
SNAPPER,SILK	4.47%	0.80%
COBIA	4.40%	0.12%
HOGFISH	4.33%	0.14%
HIND,SPECKLED	3.32%	0.93%
GROUPER,MISTY	1.38%	0.15%
GROUPER,WARSAW	0.80%	0.08%
96 Others		4.22%

Table 4-10c. Species taken of commercial trips during 2005-2008 when at least 1 pound of blueline tilefish was caught.

	Florida and Georgia		South Carolina		North Carolina	
COMMON	% Trip	% Wt	% Trip	% Wt	% Trip	% Wt
TILEFISH,BLUELINE	100.00%	8.62%	100.00%	5.74%	100.00%	31.47%
GROUPER,SNOWY	66.70%	13.41%	73.46%	13.13%	64.23%	10.05%
GROUPER,YELLOWEDGE	19.49%	9.94%	21.38%	1.35%	8.50%	0.20%
TILEFISH	13.02%	10.28%	21.87%	14.17%	3.18%	0.27%
SNAPPER,QUEEN	13.02%	1.27%	0.00%	0.00%	0.00%	0.00%
SNAPPER,SILK	9.12%	2.76%	0.74%	0.07%	1.70%	0.12%
HIND,SPECKLED	6.20%	3.44%	3.19%	0.07%	0.96%	0.01%
GROUPER,WARSAW	2.04%	0.32%	0.00%	0.00%	0.00%	0.00%
GROUPER,MISTY	0.00%	0.00%	1.47%	0.06%	0.15%	0.01%

Table 4-10d. Species caught on headboat trips during 2005-2008 when at least 1 blueline tilefish was caught.

Species	% Trips	% Number
Blueline tilefish	100.00%	3.17%
Gray triggerfish	70.00%	19.59%
Sharpnose shark	46.00%	0.31%
Vermilion snapper	42.00%	38.55%
Black sea bass	36.00%	12.87%
Snowy grouper	32.00%	0.55%
Red porgy	30.00%	6.85%
Greater amberjack	28.00%	0.17%
King mackerel	28.00%	0.31%
Yellowtail snapper	26.00%	1.85%
Gag	26.00%	0.15%
Bigeye	26.00%	0.36%
Squirrelfish	24.00%	0.29%
Jolthead porgy	20.00%	0.53%
White grunt	20.00%	7.33%
Gray snapper	18.00%	0.96%
Blue runner	18.00%	0.23%
Dolphin	18.00%	0.50%
Almaco jack	16.00%	0.55%
Wahoo	16.00%	0.07%
Knobbed porgy	14.00%	0.25%
Red snapper	12.00%	0.05%
Red grouper	12.00%	0.37%
Tomtate	12.00%	1.01%
Little tunny	12.00%	0.13%
Whitebone porgy	10.00%	0.21%
Mutton snapper	10.00%	0.04%
Bank sea bass	10.00%	0.04%
32 others		2.73%

Table 4-10e. Species taken on MRFSS trips during 2005-2008 when at least 1 blueline tilefish was caught.

Species	% Trips	% Number
tilefish family	100.00%	27.63%
black sea bass	26.67%	21.05%
grunt family	20.00%	0.00%
sea bass family	20.00%	3.95%
Bluefish	13.33%	5.26%
gray snapper	13.33%	0.00%
leatherjacket family	13.33%	0.00%
mutton snapper	13.33%	1.32%
blue runner	6.67%	0.00%
blueline tilefish	6.67%	19.74%
dolphin	6.67%	1.32%
little tunny	6.67%	1.32%
littlehead porgy	6.67%	7.89%
snowy grouper	6.67%	1.32%
unidentified fish	6.67%	0.00%
white grunt	6.67%	9.21%

4.1.2 Economic Effects

Commercial Fishery

A simulation model was used to predict the effects of Snapper Grouper Amendments 13C, 15A, and 16 on commercial fishing activity for the 2005-2008 study period. **Appendix L** outlines, in detail, the methodology used in the simulation model and is hereby incorporated by reference.

In 1993, commercial fishermen landed 13,900 pounds (gutted weight) of speckled hind and 14,000 pounds of warsaw grouper on fishing trips in federal waters, as recorded in the logbook database (Figure 4-5). Landings of both species have declined since then, as Amendment 6 to the Snapper-Grouper FMP prohibited their sale in mid-1994. There is a one fish per vessel per trip possession limit and a prohibition on sale for each species since these deep water groupers probably would not survive if released after being caught.

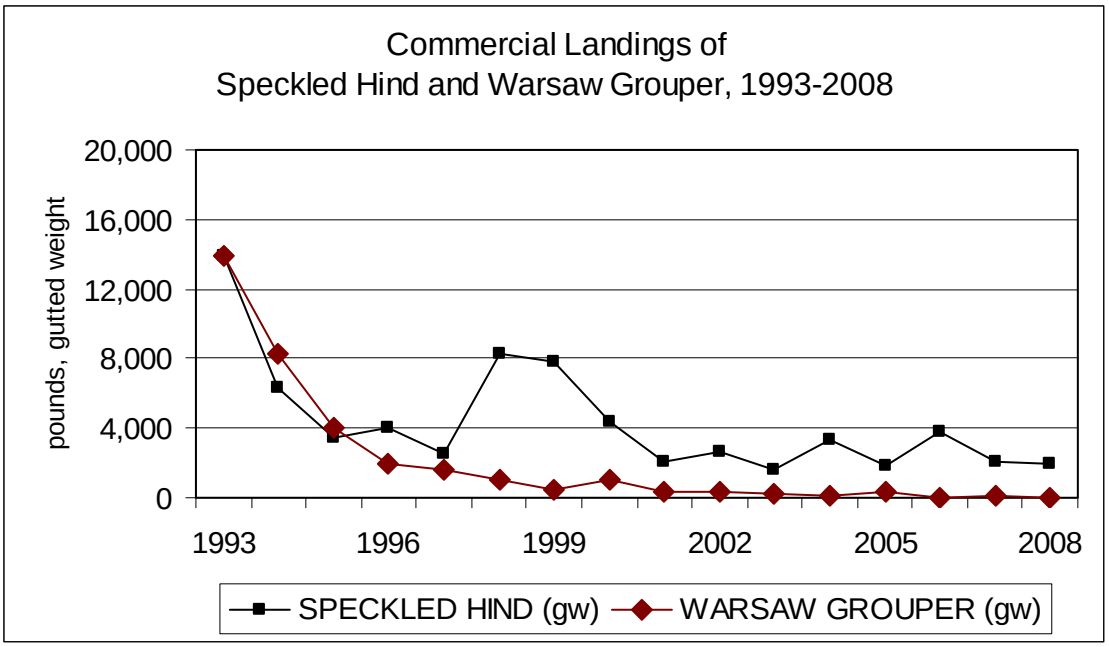


Figure 4-5. Commercial landings in federal waters: speckled hind and warsaw grouper (1993-2008).
Source: SEFSC logbook database as of June 29, 2009.

Alternative 1 (No Action) is the least restrictive management choice because it allows one fish per vessel per trip to be retained as part of the recreational aggregate bag limit for groupers and on commercial vessels regardless of depth within the EEZ. Despite the existing no-sale provision, small quantities of both species are reported. On average for 2005-2008, commercial fishermen on trips in federal waters landed 2,400 pounds (gutted weight) of speckled hind worth approximately $6,400 and 100 pounds of warsaw grouper worth $260.[3]

Alternative 2 differs from the no-action alternative in that the one fish possession limit would be eliminated. Because of the existing no-sale provision, few speckled hind or warsaw grouper are landed. Hence, the economic effect of **Alternative 2** is expected to be small. The simulation analysis predicts an average annual loss of approximately $6,000, or about 0.1% of predicted net operating revenues for the commercial fishery with the no-action alternative for Amendment 17B.[4] The expected reduction in net operating revenues is less than the average annual dockside value of speckled hind and warsaw grouper landed during 2005-2008 because the no-action alternative for Amendment 17B includes the expected reductions in landings due to Amendments 13C and 16.

[3] The logbook database does not collect prices or revenues for landed fish. Trip revenues were approximated as reported landings multiplied by average prices, by species, from the NMFS Accumulated Landings System.
[4] The commercial fishery is defined in this analysis as consisting of all trips in the logbook database that reported landing at least one pound of any species in the snapper-grouper management unit.

Alternative 3 is the most restrictive management choice because it would prohibit the harvest and sale of all major deepwater species in the snapper-grouper management unit, including snowy grouper, yellowedge grouper, blueline tilefish, silk snapper and other species. Overall, **Alternative 3** is expected to reduce net operating revenues in the snapper-grouper fishery by approximately $365,000, or by 4.2% compared to the no-action alternative (Figures 4-6a and 4-6b). The effects of this alternative are expected to be incurred primarily by boats that fish with vertical lines (Figure 4-6a), although boats with longlines would incur greater losses in percentage terms (Figure 4-6b) because **Alternative 3** would prohibit the harvest of snowy grouper and yellowedge grouper. Vessels that use bottom longline gear are expected to incur losses that average approximately 12.2% of base net operating revenues. Boats in North Carolina and the Florida Keys would incur the greatest reductions in net operating revenues (Figures 4-7a and 4-7b), primarily due to the prohibition on the harvest of snowy grouper and blueline tilefish. Net operating revenues for boats in North Carolina are predicted to decline by an average of 8.7% per year, while net operating revenues for boats in the Keys are predicted to decline by approximately 4.2% per year compared to the no-action alternative.

Alternative 4 (Preferred) is less restrictive than **Alternative 3** because it would exclude from the prohibition the harvest of deep water species in waters shallower than 240 feet. However, it is only slightly less restrictive because most deepwater species are landed in waters of 240 feet or deeper. Overall, **Alternative 4 (Preferred)** is expected to reduce net operating revenues in the snapper-grouper fishery by about $292,000 or by 3.3 percent (Figures 4-6a and 4-6b). The effects of this alternative are expected to be slightly smaller than those of **Alternative 3**. The expected reductions in net operating revenues would be incurred primarily by boats that fish with vertical lines (Figure 4-6a), although boats with longlines would incur greater losses in percentage terms (Figure 4-6b). Vessels that use bottom longline gear are expected to incur losses that average approximately 11.5% of base net operating revenues. Net operating revenues for boats in North Carolina are predicted to decline by an average of 7.2% per year, while net operating revenues for boats in the Keys are predicted to decline by approximately 3.9% per year compared to the no-action alternative.

Alternative 5 is less restrictive than **Alternative 4 (Preferred)** because it would exclude from the prohibition the harvest of deep water species in waters shallower than 300 feet. Overall, **Alternative 5** is expected to reduce net operating revenues in the snapper-grouper fishery by about $225,000 or by 2.6 percent (Figures 4-6a and 4-6b). The effects of **Alternative 5** by gear (Figures 4-6a and 4-6b) and state (Figures 4-7a and 4-7b) are expected to be smaller than those of **Alternatives 3** and **4**. Vessels that use bottom longline gear are expected to incur losses that average approximately 8.2% of base net operating revenues. Net operating revenues for boats in North Carolina are predicted to decline by an average of 4.9% per year, while net operating revenues for boats in the Keys are predicted to decline by approximately 3.6% per year compared to the no-action alternative.

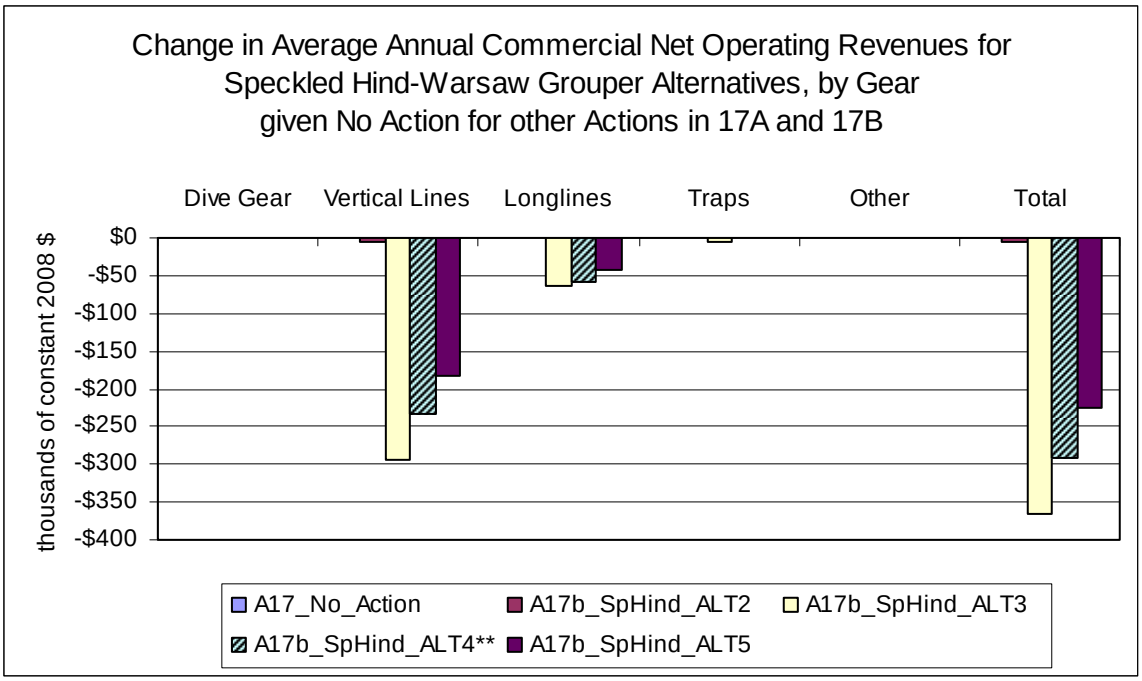


Figure 4-6a. Predicted change in commercial net operating revenues by gear type for speckled hind-warsaw grouper alternatives compared to **Alternative 1 (Status Quo)** for Amendment 17B.
Note: ** denotes the Council's preferred alternative.

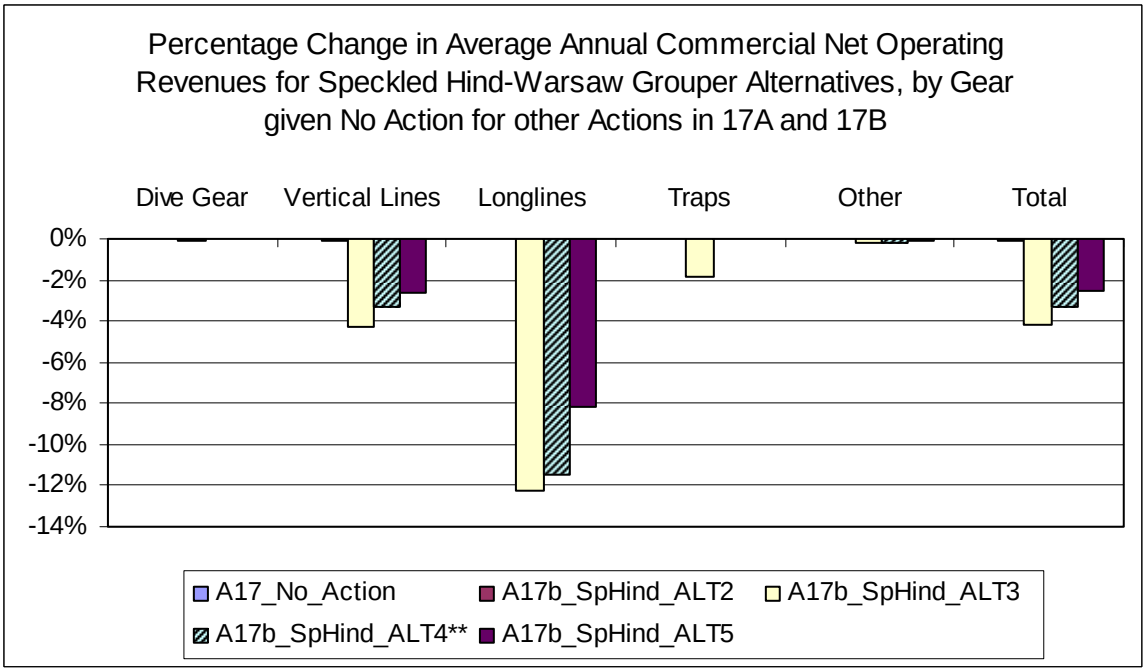


Figure 4-6b. Predicted percentage change in commercial net operating revenues by gear type for speckled hind-warsaw grouper alternatives compared to the No-Action alternative for Amendment 17B.
Note: ** denotes the Council's preferred alternative.

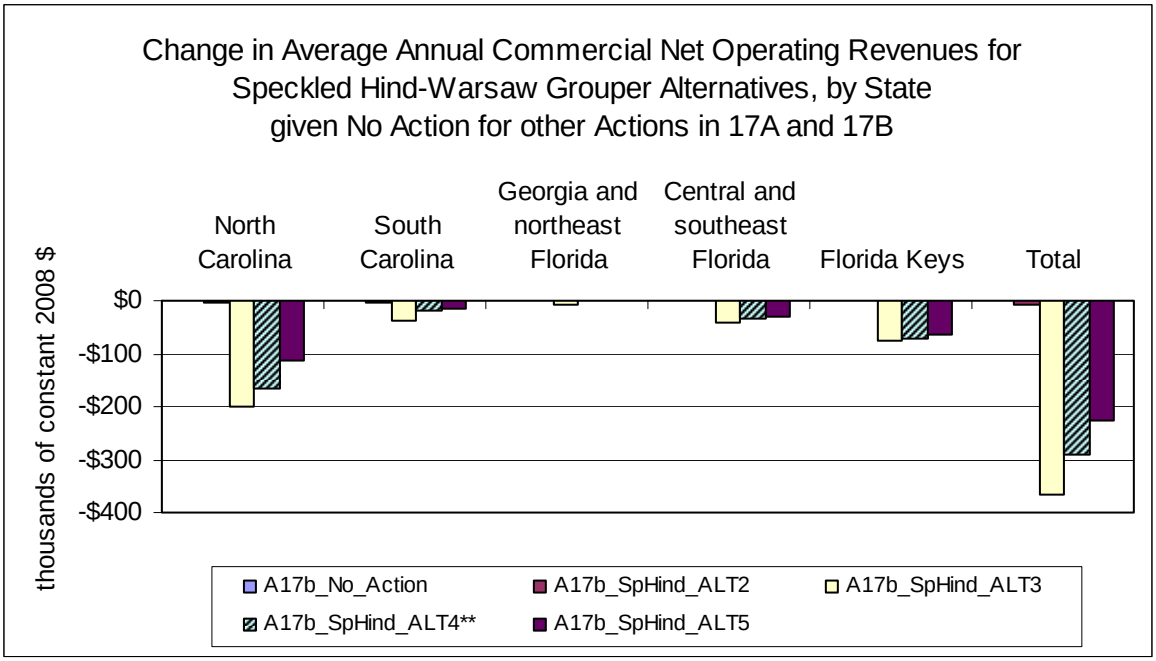


Figure 4-7a. Predicted change in commercial net operating revenues by state of landing for speckled hind-warsaw grouper alternatives compared to the No-Action alternative for Amendment 17B.
Note: ** denotes the Council's preferred alternative.

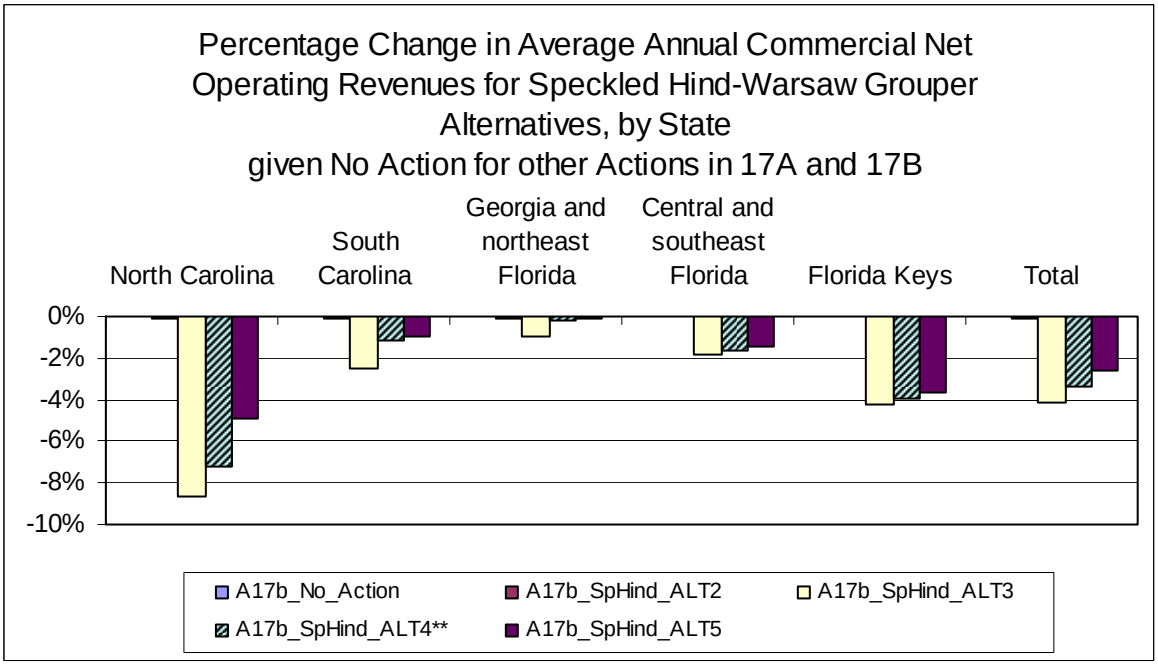


Figure 4-7b. Predicted percentage change in commercial net operating revenues by state of landing for speckled hind-warsaw grouper alternatives compared to the No-Action alternative for Amendment 17B.
Note: ** denotes the Council's preferred alternative.

Recreational Fishery

The methodology employed in this assessment follows the methodology employed in NMFS (2008a and 2008b). NMFS (2008a) analyzed the expected economic effects of a recreational closure of the red snapper fishery in the Gulf of Mexico in 2008. The methodology for that assessment is thoroughly documented in that report and is incorporated herein by reference. NMFS (2008b) analyzed the expected economic effects of the interim rule to close the red snapper fishery in the South Atlantic, and the methodology described in that document is incorporated herein by reference. A general description of the methodology employed for the current amendment is provided below. More details on the method used to estimate the economic effects of this amendment on the recreational sector are provided in **Appendix M**.

This assessment evaluated the expected change in economic value to fishers and for-hire vessels in response to the proposed alternatives. The change in economic value is measured in terms of the consumer surplus (CS) to recreational anglers and net operating revenues (NOR) to for-hire vessels. CS in the present case 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 the appropriate measure of economic effects on recreational anglers as a result of changes in fishing regulations. NOR is the net operating revenue, expressed on a per angler basis, a charterboat or headboat derives from a fishing trip. NOR is calculated as revenue minus the costs for fuel, ice, bait, and other supplies.

Alternative 1 (Status Quo) has no short-term economic effects on the recreational sector, but by not providing sufficient protection to the stocks, it could reduce the long-term economic benefits derivable from the fishery.

The overall short-run economic effects of **Alternative 2** would appear to be relatively small as can be partly inferred from the relative levels of recreational harvest and effort on speckled hind and warsaw grouper. In 2005-2008, the recreational sector harvested an average of 13,000 pounds annually of these two species (Table 4-11). Of this total, about 56% was accounted for by the private/rental mode, 27% by the charter mode, and 17% by the headboat mode. There is little evidence on the desirability of these two species as target species on recreational trips. There is virtually an absence of target trips for these two species by the charter and private/rental modes of fishing (Table 3-46). No targeting effort information for headboats is generally collected on a routine basis as those for the other fishing modes, and unlike for **Alternative 3** below, no attempt is made to estimate the possible number of headboat trips targeting the two species. Hence, it is likely that the economic effects of **Alternative 2** on recreational anglers (at least those fishing through the charter and private/rental fishing modes) and potentially on for-hire operations would be relatively small. The economic effects on headboats would depend on the importance of these two species on their fishing trips, but this cannot be ascertained with current available information.

Of the various alternatives, **Alternative 3** would be expected to bring about the largest adverse economic impacts on the recreational sector in the short run, considering the larger number of species being subject to the ban on retention and possession. The recreational harvests of deepwater species is shown in Table 4-11. Recreational harvests of yellowedge grouper, misty grouper, and queen snapper are sparse, so they are combined for the current purpose. A total harvest of about 346 thousand pounds of deepwater species is approximately 3% of total recreational harvest of snapper grouper in the South Atlantic. While relatively small, harvests of deepwater species could be a significant part of charterboat harvests, as these species comprise about 12.6% of total charterboat harvests of snapper grouper. Headboat and private/rental harvests of deepwater species comprise only about 0.3% and 1.2% of their respective total harvests of snapper grouper.

An examination of target effort depicts a slightly different scenario. For the years 2005-2008, an average of 1,856 trips was taken by charterboat and private/rental anglers targeting deepwater species. No species-specific target trip information for anglers fishing on headboats is available, but some attempt in estimating this number is shown in the table and discussed below. Of the total trips targeting deepwater species with the exclusion of headboats, 84% were accounted for by private/rental mode anglers and 26% by charterboat anglers. Based on the number of target trips for deepwater species, the private/rental mode anglers would experience more consumer surplus reductions than their charterboat counterparts would under **Alternative 3**. Even though harvests of deepwater species comprised only 1.2% of total snapper grouper harvests by private/rental anglers, valuation of this harvest level would appear to be more than that of harvests through charterboats. Only Florida and North Carolina registered target trips for deepwater species, and total target trips are about evenly divided between these two states.

Considering the number of species involved, an attempt is made to estimate the number of headboat trips "targeting" deepwater species. The target trips of 963 shown in Table 4-11 is estimated by multiplying the number of headboat angler trips by the ratio of deepwater species caught to total snapper-grouper caught in headboats. The ratio is calculated by area and applied to headboat trips by area, and the resulting numbers are summed across all areas. The calculated number of headboat trips appears to overestimate the unknown true number of headboat trips targeting deepwater species. This can be inferred from the fact that headboats generally account for only a small portion of total deepwater species harvested by the recreational sector. The immediate implication here is that economic losses to the headboat sector are overestimated.

Table 4-11 South Atlantic average harvest of and target effort for deepwater species, by mode, 2003-2008.

Species	Charterboat	Headboat	Private/Rental	Total
Harvest in Pounds				
Snowy Grouper	59,649	665	470	60,785
Speckled Hind	1,283	1,195	119	2,596
Warsaw Grouper	2,285	1,013	7,128	10,425
Blueline Tilefish	179,646	513	88,637	268,795
Silk Snapper	399	1,757	217	2,372
Yellowedge Grouper, Misty Grouper, Queen Snapper	428	30	352	811
Total	243,690	5,173	96,923	345,784
Target Trips				
All Deepwater Species	290	963	1,566	2,818
Harvest in Number of Fish				
Snowy Grouper	5,676	168	1,815	7,659
Speckled Hind	159	441	149	749
Warsaw Grouper	125	78	528	730
Blueline Tilefish	41,616	180	17,622	59,417
Silk Snapper	1,865	1,112	117	3,094
Yellowedge Grouper, Misty Grouper, Queen Snapper	85	17	812	913
Total	49,525	1,994	21,043	72,561

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

By allowing harvest, possession, and retention of deepwater species within a depth of 240 feet, **Alternative 4 (Preferred)** would provide lower negative economic effects than **Alternative 3**. The magnitude of differential economic effects would depend on the level of recreational activities for the deepwater species in the open areas. This amount cannot be estimated with available information. In the same manner, **Alternative 5** would result in less negative economic effects than **Alternative 3** and **Alternative 4 (Preferred)**, but the differential effects cannot be estimated.

To provide some insights into the possible magnitude of the short-run economic losses, changes to consumer surplus and net operating revenues, in 2009 dollars, are presented in Table 4-12.

Total economic effects of **Alternative 3** would be approximately $5.9 million. **Alternative 2** would result in significantly lower short-run economic effects than those presented in the table. In addition, the economic effects of **Alternative 4 (Preferred)** would be lower than those of **Alternative 3** but higher than those of **Alternative 2**. In addition, the economic effects of **Alternative 5** would be less than those of **Alternative 4 (Preferred)**, but possibly greater than those of **Alternative 2**. The effects of these other alternatives cannot be quantified with available information. To the extent that we assign the value of all catches to target trips, the estimated change in consumer surplus would likely be overestimates of the economic effects of **Alternative 3**. This is due to the resulting higher average kept rates per angler per trip.

Table 4-12. Reductions in consumer surplus and net operating revenues due to Alternative 3.

	Charterboat	Headboat	Private/Rental	Total
CS	$3,961,980	$159,520	$1,683,400	$5,804,900
NOR	$37,088	$65,484		$102,572
Total	$3,999,068	$225,004	$1,683,400	$5,907,472

4.1.3 Social Effects

As discussed in **Section 1.2**, ACLs specify the amount of allowable annual harvest of a species per year. Exceeding the ACL, or, possibly, the ACT if l specified, triggers the AMs. In general terms, the higher the ACL, the greater the short-term social and economic benefits that would be expected to accrue, assuming long-term status goals (i.e., the stock does not become overfished or undergo overfishing) are not jeopardized. Maintaining long-term stock targets or conditions is assumed to result in net long-term positive social and economic benefits because these targets and conditions encompass a balance of the considerations of the health of the resource and the economic and social needs of society.. Thus, it is important that short-term decisions, such as allowable annual harvest levels, be consistent with the long-term objectives. However, although the net long-term outcome of a management path may be positive, the short-term consequences to fishery participants and associated businesses and communities of short-term management decisions may be so severe (e.g., these entities may be forced to leave the fishery) that the long-term benefits accrue to different entities than those who bear the consequences of the short-term actions.

Regulatory change may cause some of the following direct and indirect consequences: increased crew and dockside worker turnover; displacement of social or ethnic groups; increased time at sea (potentially leading to increased risk to the safety of life and boat); decreased access to recreational activities; demographic population shifts (such as the entrance of migrant populations replacing or filling a market niche); displacement and

relocation as a result of loss of income and the ability to afford to live in coastal communities; increased efforts from outside the fishery to affect fishing related activities; changes in household income source; business failure; declining health and social welfare; and increased gentrification of coastal communities as fishery participants are unable to generate sufficient revenue to remain in the community. Ultimately, one of the most important measurements of social change is how these social forces, in coordination with the strategies developed and employed by local fishermen to adapt to the regulatory changes, combine to affect the local fishery, fishing activities and methods, and the community as a whole.

A major indirect effect of fisheries management on the fishing community and related sectors is increased confusion and differences between the community and the management sector in levels of understanding and agreement on what is best for both the resource and the community. The fact that "the science" can result in relatively large reductions in harvests with associated reductions in short-term social and economic benefits, is particularly disconcerting to many fishermen and concerned stakeholders. This can result in enforcement problems and non-compliance with current and future regulations, which can lead to inefficient use of resources, ineffectual regulations, and failure to meet management targets, which may precipitate additional restrictions.

In general, smaller harvest levels entail greater short-term dislocations and adjustments for the social environment. Commercial and recreational fishermen may be able to adjust to harvest reductions by switching to other species or by leaving fishing and seeking other employment or recreational opportunities elsewhere. If other species are depleted, regulations may prevent fishermen from freely switching to another fishery, or if other forms of employment or recreational activities are unavailable or difficult to find, then the adjustments would be more severe than if alternatives were readily available.

With the exception of **Alternative 1 (Status Quo)**, each of the alternative ACL options for speckled hind and warsaw grouper would establish a zero ACL and prohibit all harvest (possession and retention) for each species until modified. **Alternative 1 (Status Quo)** would not specify an ACL, ACT, or AM. Because ACLs and AMs are now required components of FMPs, **Alternative 1 (Status Quo)** is not a viable long-term action, meaning its selection would require additional subsequent council action to re-address these requirements.

As stated in the previous paragraph, **Alternatives 2-5** specify identical ACLs (zero) for speckled hind and warsaw grouper and prohibit the harvest of both species. The alternatives vary in restrictions on the harvest of other deepwater snapper grouper species. While catch and release fishing in the recreational sector could still occur, the resultant mortality of caught fish due to the depths at which they are caught may discourage most anglers from such intentional behavior. Even without directed behavior, some incidental harvest of these species would be expected to continue, in both the recreational and commercial sectors, and any associated prohibition on retention may induce the perception of waste, with the magnitude of said perceptions expected to increase directly with the magnitude of affected catch.

Alternative 2 would only restrict the harvest of speckled hind and warsaw grouper. This alternative would be expected to have minimal to no adverse social effects because neither species is a significant target or harvest species in the recreational sector, with less than 20,000 pounds combined harvested per year from 2003-2008 and virtually no targeted effort (see Section 3.8.2), and sale has been prohibited in the commercial sector since mid-1994, although a one-fish possession limit for each species for personal consumption has been allowed in recognition of the likely release mortality of caught fish due to the depth at which they are caught. Despite the prohibition on sales, reported commercial harvests still occur (see Section 3.8.1.11), but are minor compared to other snapper grouper species and all harvest by commercial vessels is assumed to be bycatch of fishing for other snapper grouper species. Harvest prohibition would not stop the loss of bait or the time associated with the removal of incidental catch they could not keep, but such would be expected to have minimal social effects. The primary social effect by both sectors would likely be the perception of waste of fish not expected to survive release.

In addition to specifying an ACL of zero for speckled hind and warsaw grouper, **Alternative 3** would prohibit the harvest of additional deepwater species in order to minimize the incidental catch of speckled hind and warsaw grouper. As the number of species included in the prohibition increases, the magnitude of expected adverse social effects increases. This alternative is the most restrictive of all alternatives considered and, as a result, would be expected to have the greatest negative social impact on fishermen and associated businesses and communities, particularly due to the inclusion of snowy grouper in the list of prohibited species, In the commercial sector, an average of 387 trips per year from 2003-2007 were recorded with snowy grouper as the top source of trip revenue (see Section 3.8.13). In the recreational sector, while the majority of harvests of warsaw grouper, which is a more important harvest species than speckled hind, occurs by private anglers, expansion of the prohibition to include additional deepwater species would increase the adverse effects disproportionately to the for-hire sector, particularly due to the inclusion of snowy grouper, because the charterboat sector harvests the majority of recreationally harvested snowy grouper and these harvests comprise a larger portion of total charterboat harvests than harvests in the private/rental sector. Most effects would be expected to accrue to Florida and North Carolina fishermen and associated businesses and communities.

In addition to specifying an ACL of zero for speckled hind and warsaw grouper, **Alternative 4 (Preferred)** would only prohibit the harvest of additional deepwater species from waters beyond a depth of 240 feet. As a result, the additional harvest restrictions would be expected to be less severe and with less adverse social effects than under A**lternative 3** and would, be expected to result in greater adverse social effects than **Alternative 2**.

Alternative 5 would modify the depth restriction of **Alternative 4 (Preferred)** to waters beyond 300 feet. As a result, the harvest restrictions would be less than those of

Alternative 4 (Preferred). Thus, **Alternative 5** would be expected to result in reduced adverse social effects relative to **Alternative 4 (Preferred)**.

In summary, **Alternative 1 (Status Quo)** is not a viable alternative because it would not establish required components of FMPs. **Alternative 4 (Preferred)** would be expected to result in greater adverse social effects than **Alternative 2**, because it would also prohibit the harvest of additional deepwater species, but fewer adverse social effects than **Alternative 3** because only harvests of these additional species from deeper waters would be prohibited. Because **Alternative 5** would impose less severe harvest restrictions than **Alternative 4 (Preferred)**, it would be expected to result in lower adverse social effects relative to **Alternative 4 (Preferred)**.

4.1.4 Administrative Effects

Under **Alternative 1 (Status Quo)**, administrative impacts would likely be negative if the result of not implementing more restrictive measures now meant having to require additional and more drastic amendment actions in the future. **Alternatives 2** and **3** would both create a minimal adverse impact on the administrative environment since regulations would need to be updated, outreach materials would need to be developed, and coordination with the Office of Law Enforcement would be necessary. **Alternative 4 (Preferred)** and **Alternative 5** would be the most administratively burdensome of the alternatives since they would also require enforcement and monitoring of the 240 foot and 300 foot depth boundaries respectively. Outreach efforts under **Alternative 4 (Preferred)** and **Alternative 5** would need to be far-reaching and detailed in order to orchestrate the dissemination of designated fishing area information including depth contour way points for fishermen to enter into their plotters for compliance purposes.

4.1.5 Council's Conclusions

The Snapper Grouper Advisory Panel (AP), through consensus, recommended that the western boundary of the deepwater closure be moved from a 240 to a 300 foot depth (5 for, 3 against, and 6 abstentions). The AP recommended that the closure beginning at the 240 foot depth by removed from consideration (12 for and 1 against).

The Law Enforcement Advisory Panel (LEAP) recommended that the western boundary of the deepwater closure be aligned with the eastern line of the closure proposed in Snapper Grouper Amendment 17A. The LEAP recommended the designation of an allowable golden tilefish fishing area. The LEAP recommended that transit only be allowed with wreckfish onboard.

The Scientific and Statistical Committee (SSC) was concerned that golden tilefish was not included in the group of deepwater species. The SSC believed that bottom habitats differ for golden tilefish (sand/mud vs. hard bottom for the other species) but nonetheless believed that some fishers "deep dropping" for tilefish may stray into hard bottom habitat and catch other deep water species, resulting in enforcement issues.

The SSC emphasized that these are extremely data poor species and that the uncertainty associated with any stock status information will be large. Consistent with that fact, the SSC could not determine whether any of the proposed measures will end overfishing because the overfishing level is unknown, the current mortality is unknown, and discards are poorly known. In addition, continued fishing for golden tilefish may increase discards in an unpredictable fashion. The SSC noted that as speckled hind recovers there may be greater numbers of individuals in mid-shelf waters, along with a concomitant increase in the number of discards. The SSC noted that the amendment is silent with respect to a discard trigger and doesn't speak to the number of discards that might promote the continuance of overfishing. Hence, the SSC believed that those options that minimize the number of discards are most likely to end overfishing. The SSC noted that a deepwater closure will impact the ability to collect data and recommends that sampling strategies be devised to continue the collection of fishery data.

The Council selected **Alternative 4** as the preferred alternative. It would establish an ACL equal to zero (landed catch only) for speckled hind and warsaw grouper and prohibit all fishing for, possession, and retention of deepwater snapper species including, snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper, beyond a depth of 240 feet (40 fathoms; 73 m). This alternative would provide protection to the largest, most fecund fish and ensure a natural sex ratio into the future. Prohibiting all harvest of deepwater snapper grouper species beyond 240 feet would also protect spawning aggregations, as well as decrease bycatch mortality of speckled hind, warsaw grouper, and other co-occurring deepwater snapper grouper species. In choosing to implement an ACL equal to zero, an AM is also established in the form of a year-round seasonal closure. The Council not only chose **Alternative 4 (Preferred)** for its potential biological benefits, but also because **Alternative 4**

(Preferred) would have a lower negative socioeconomic impact than other alternatives considered since it would allow fishing in waters shallower than 240 ft.

The Council decided not to include golden tilefish in the list of deepwater species that would be affected under **Alternative 4 (Preferred)** because golden tilefish are usually caught over mud habitat. Speckled hind and warsaw grouper prefer rocky habitats and are not found over mud. Examination of logbook and MRFSS data indicates warsaw grouper and speckled hind were very rarely taken on trips with golden tilefish during 2005-2008.

The Council recognizes there will be some discard mortality resulting from fishing for non-deepwater species deeper than 240 feet if such trips occur and from the mid-shelf fishery shallower than 240 feet. However, this is the closest to no harvest of speckled hind and warsaw grouper possible while still allowing a fishery for mid-shelf species.

The Council concluded the preferred alternative is sufficient to end overfishing of speckled hind and warsaw grouper, that this action meets the new Magnuson-Stevens Act requirements for speckled hind and warsaw grouper, and the preferred alternative meets the SSC's recommendation of ABC = zero landings. The Council also concluded the preferred alternative best meets the goals and objectives of the Snapper Grouper FMP as amended.

4.2 Golden tilefish

4.2.1 Golden Tilefish Allocations

Alternative 1 (Status Quo). Do not define allocations for golden tilefish.

Alternative 2. Define allocations for golden tilefish based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on landings from the years 2006-2008. The allocation would be 96% commercial and 4% recreational.

Alternative 3. (Preferred) Define allocations for golden tilefish based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on the following formula for each sector: Sector apportionment = (50% * average of long catch range (lbs) 1986-2008) + (50% * average of recent catch trend (lbs) 2006-2008). The allocation would be 97% commercial and 3% recreational.

Alternative 4. Split the allocations for golden tilefish equally among the two sectors. The allocation would be 50% commercial and 50% recreational.

4.2.1.1 Biological Effects

Alternative 1 (Status Quo) would not specify a commercial or recreational allocation for golden tilefish. If an allocation is not specified then it would not be possible to identify the ACL in the recreational sector. Only a single ACL could be established for both sectors and the AM for the recreational sector would be to prohibit harvest when the commercial ACL is met. The commercial quota could be specified; however, as Amendment 13C used landings from 1999-2003 to establish the commercial quota (98% commercial/2% recreational). This alternative would also perpetuate the existing levels of risk to ESA-listed species.

Alternatives 2-4 would range from 50% commercial/50% recreational (**Alternative 4**) to 97% commercial/3% recreational (**Alternative 3 (Preferred)**). Alternatives that allocate a greater portion of the harvest to the commercial sector could have a greater negative impact on habitat since golden tilefish are predominately taken with longline gear, which is considered to do greater damage to hard bottom habitat than vertical hook and line gear (SAFMC 2007). However, damage to bottom habitat with longline gear has not been very well documented. During 2005-2008, approximately 90% of the commercial catch of golden tilefish was with bottom longline gear.

Based on the allocations specified in **Alternatives 2-4**, the recreational portion of the TAC would range from 9,011 lbs gutted weight or 1,625 fish (**Alternative 3 (Preferred)**) to 150,190 lbs gutted weight or 27,087 fish (**Alternative 4**). The recreational portion of

the TAC under **Alternative 2** would fall between that of **Alternatives 3 (Preferred)** and **4** at 2,167 fish (12,015 lbs gutted weight). During 1998-2008, recreational landings (MRFSS) averaged 35,148 lbs whole weight and 10,459 individuals; however, landings during 2005 are probably overestimates due to the level of sampling conducted under MRFSS (Table 4-13). Although Amendment 13C reduced the recreational bag limit of golden tilefish to 1 fish per person in the grouper aggregate bag limit, landings higher than 9,011 lbs gutted weight could occur. Furthermore, there could be increased discards of dead golden tilefish resulting from the more restrictive bag limit. However, data in Table 4-13 suggests the measures implemented through Amendment 13C in October 2006 may have reduced recreational harvest of golden tilefish in 2007 and 2008. In addition, the number of discarded golden tilefish (B2s) has remained at 0 since new management measures were implemented.

Table 4-13. Recreational landings (pounds whole weight and number (A+B1)) of golden tilefish from MRFSS Web site.

Year	Weight (lbs)	PSE	HARVEST (TYPE A + B1)	PSE	RELEASED ALIVE (TYPE B2)	PSE
1998	2,255	101	472	101	0	0
1999	4,409	78.3	1,950	62	0	0
2000	1,803	46.2	3,171	76.9	2,000	71.5
2001	26,799	59.2	3,150	44.9	0	0
2002	9,246	52.7	2,036	45.4	0	0
2003	28,029	41.7	7,833	40.8	2,088	74.9
2004	25,007	39.4	11,242	37.8	0	0
2005	240,240	40.3	70,304	39.2	1,036	100
2006	44,061	54.3	12,723	45.4	0	0
2007	4,782	0	2,165	59.8	0	0
2008	0	0	0	0	0	0
average	35,148		10,459		466	

Alternative 4 would divide golden tilefish allocations equally among the recreational and commercial sectors. This could result in a substantial reduction in the commercial harvest while allowing a potential increase in recreational harvest that may not be attainable with a restriction of one fish per person per day. As a result, an overall decrease in harvest of golden tilefish could occur under **Alternative 4** resulting in biological benefits for the species. Therefore, the biological benefit of **Alternative 4** would exceed all other alternatives, while there would be little difference among **Alternatives 2** and **3 (Preferred)**.

Alternative 1 (Status Quo) will perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. **Alternatives 2-4** are unlikely to have adverse effects on ESA-listed species, including recently listed *Acropora*. Previous ESA consultations determined the snapper grouper fishery was not likely to adversely affect *Acropora* species (See **Section 3.5**). These alternatives are unlikely to alter fishing behavior in a way that would cause new adverse effects to these species. The impacts from **Alternatives 2-4** on sea turtles and smalltooth sawfish are unclear. If these

allocations perpetuate the existing amount of fishing effort, but cause effort redistribution, any potential effort shift is unlikely to change the level of interaction between sea turtles and smalltooth sawfish and the fishery as a whole. If these alternatives reduce the overall amount of fishing effort in the fishery, the risk of interaction between sea turtles and smalltooth sawfish will likely decrease.

4.2.1.2 Economic Effects

Commercial impacts

Alternatives 1-4 differ little in their impacts to the commercial golden tilefish fishery. Given that **Alternative 1 (Status Quo)** allows for the highest commercial allocation (98%), this offers the greatest economic benefits for the commercial fishery. The benefits from **Alternatives 3 (Preferred)** are preferable to **Alternatives 2** and **4** which offer commercial allocations of 96% and 50%, respectively. It is unlikely that the current participation level in the longline fishery for golden tilefish will be maintained under **Alternative 4**. Either trip limits will be too low to allow for trips to remain profitable or the season for fishing will be so short, due to a race to fish, that the total landings made by any one vessel will be insufficient to support continued operations. **Alternative 4** offers the least desirable option for the commercial fishery.

Recreational impacts

The general nature of any management imposed fish allocation is that either the user groups would be able to maintain their respective fishing opportunities or one group would benefit more but usually at the expense of the other(s). From a purely economic standpoint, an allocation alternative may be adjudged better than any other alternatives if it would result in net economic benefits to society. This could happen if at least one group benefits while the other groups are not made worse off; or if one group is made worse off, the extent of benefits to the "winning" group outweighs the losses to the others. One complicating issue of this general rule is the choice of baseline values from which an allocation change is made. In the present case where the allocation is solely based on landings by the commercial and recreational sectors, regulations affecting both sectors could have affected the actual distribution of landings. In such a case, the historical landings may not be considered ideal in determining the "economically best" allocation alternative, because those landings were not mainly driven by the economics of the two sectors. In addition, there currently exists no adequate commercial and recreational sector economic model for use in assessing the economic outcome of the various allocation alternatives. Given these considerations, the analysis of the various allocation alternatives can only focus on their distributional implications.

Alternative 1 (status quo) would not alter the course of sector landings and thereby would not change the economic status of the two sectors. **Alternatives 2** and **3 (Preferred)**, although based on landings in different periods, would essentially result in similar sector allocations. Each sector would likely receive an allocation that is reflective

of their historical landings, so the potential change in distributional landings would be relatively minimal. Therefore, the consequent economic benefits/losses of each sector would unlikely be affected. **Alternative 4** would allocate fish to the recreational sector that would be significantly higher than the sector's historical landings. In principle, this alternative would provide the recreational sector more opportunities to generate more economic benefits from the fishery. On the other hand, the commercial sector would be severely restricted by this alternative.

4.2.1.3 Social Effects

Monitoring and managing sector harvests, where harvest limits exist, requires the establishment of sector allocations to specify how the total allowable harvest is to be distributed among competing sectors. Although expected levels of sector harvest can be determined based on historical distributions, absent sector allocations, resource harvest assessments relative to targets are only meaningful from the perspective of combined harvests by all sectors. Should the total harvest exceed the targeted harvest, without sector allocations, it is difficult to conclude whether responsibility for the overage should be attributed to a particular sector or all sectors (while historical harvest may have been lower, the absence of a specific allocation demonstrates the absence of any requirement to remain so), or identify and implement corrective measures that equitably assign responsibility to a particular sector. While the concept of AMs is biological in nature - identifying corrective measures that end and compensate for harvest overages to achieve biological goals – allocations allow AMs to accomplish this in a manner that achieves social and economic equity by not imposing costs on sectors that are not responsible for the overage.

Because allocations for golden tilefish are not currently specified, **Alternative 1 (Status Quo)** would prohibit establishing sector harvest limits or AMs that allow sector-level harvest assessment and the implementation of respective sector-level AMs in a manner that achieves sector social and economic equity. Overall harvest goals could be maintained, as stock goals could still be monitored and evaluated at the total fishery level. However, if sector-level equity issues are legitimate considerations, the overall social and economic benefits of the fishery would be expected to be lower than under an appropriate sector allocation.

Although **Alternative 2** and **Alternative 3 (Preferred)** would specify allocations according to harvest patterns over different periods of time, both would result in allocations that are largely identical, varying by just one percentage point, with the commercial sector receiving either 96 or 97% of the total allowable harvest, and the recreational sector receiving the remainder. As such, both essentially equal historic sector harvest patterns and little to no change in social benefits from current levels would be expected, nor would the benefits be substantially different between each alternative.

Alternative 4 would specify equal allocations of 50% for both the commercial and recreational sectors and, as such, would represent a substantial departure from historic

harvest patterns. Given a fixed amount of total allowable harvest, no sector can gain harvests, and associated social and economic benefits, without adverse effects accruing to competing sectors. In this instance, while the golden tilefish fishery is not large compared to the total snapper grouper commercial fishery (330,000 pounds of golden tilefish per year compared to 6.4 million pounds of all snapper grouper species per year; see **Section 3.8.1.2**), the commercial allocation under **Alternative 4** would be almost a 50% reduction from historic average annual harvests. Allocation away from historical distributions is a particularly divisive issue in fisheries, regardless of the amount of quantitative justification the allocation may appear to have. This is particularly true when incomes and livelihoods become affected. While appropriate data on business failure/exit do not exist, anecdotal information point to the increasing difficulty commercial fishermen have remaining in fisheries in general due to increased fuel costs, stagnant or declining ex-vessel prices, decreasing dock space and numbers of fish houses, fewer or more restrictive species options, and generally more restrictive management measures. While similar pressures exist for for-hire business operators, and **Alternative 4** may help some for-hire businesses weather the strains of other increasingly restrictive management measures, information is not available to justify benefiting this sector, or the recreational sector in general, at the expense of the commercial sector. Absent specific information that the social and economic benefits of the allocation specified by **Alternative 4** would result in a net gain to society, it is assumed that an allocation that results in the least alteration of historic harvest patterns would be the preferable allocation from the social perspective.

In summary, **Alternative 1 (Status Quo)** is not a viable alternative because it would not support sufficient sector monitoring and management consistent with the needs of ACLs and AMs. The expected social effects of **Alternative 2** and **Alternative 3 (Preferred)** would be expected to be virtually indistinct because each would establish allocations that effectively mirror historic harvest patterns. **Alternative 4** would result in the greatest deviation from historic harvest patterns and, as a result, would be expected to result in the greatest adverse social effects.

4.2.1.4 Administrative Effects

Alternatives 2 through **4** could increase the indirect administrative effects to NOAA Fisheries Service as landings would need to be monitored in relation to the commercial and recreational portion of the allocation for overage and commercial quota purposes. There would not be any measurable differences in the administrative effects between allocation **Alternatives 2, 3 (Preferred),** and **4.**

4.2.1.5 Council's Conclusions

The Snapper Grouper Advisory Panel did not have any recommendations.

The Law Enforcement Advisory Panel did not have any recommendations.

The Scientific and Statistical Committee (SSC) did not have any recommendations.

The Council selected **Alternative 3** as their preferred golden tilefish allocation alternative. The allocation would be 97% commercial and 3% recreational. Beginning in 2010, the commercial allocation would be 291,369 lbs gutted weight and the recreational allocation would be 1,625 fish (9,011 lbs gutted weight). The commercial and recreational allocations specified for 2010 would remain in effect beyond 2010 until modified. For the commercial sector, the benefits from **Alternatives 3 (Preferred)** are preferable to **Alternatives 2** and **4,** which offer commercial allocations of 96% and 50%, respectively. It is unlikely that current participation level in the longline fishery for golden tilefish will be maintained under **Alternative 4**. **Alternative 3 (Preferred)** deviates the least from the status quo, and therefore would cause the least amount of economic disruption with negligible biological impacts. Furthermore, the Council felt an additional benefit of **Alternative 3 (Preferred)** was its inclusion of a transparent formula to specify allocations.

The Council concluded balancing long-term catch history with recent catch history is the most fair and equitable way to allocate golden tilefish. Specifying allocations for both recreational and commercial sectors allows the Council to meet the new Magnuson-Stevens Act requirements. The Council also concluded the preferred alternative best meets the goals and objectives of the Snapper Grouper FMP as amended.

4.2.2 Golden Tilefish ACLs and AMs

Alternative 1 (Status Quo). Retain existing regulations for golden tilefish. The commercial ACL, based on the commercial quota (currently set at the F_{MSY} level), equals 331,000 lbs ww (295,000 lbs gw). The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is projected to be met. All purchase and sale is prohibited when the quota is projected to be met. Do not implement ACLs or AMs for the recreational sector.

Alternative 2 (Preferred). Establish the ACL at the F_{OY} level (Total ACL = 326,554 lbs whole weight or 291,566 lbs gutted weight). The commercial ACL (commercial ACL = 282,819 lbs gw) is based on the allocation alternative selected (97% commercial:3% recreational). The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is projected to be met. All purchase and sale is prohibited when the quota is projected to be met.

Specify a recreational ACL in numbers of fish (1,578 fish) based upon the allocation decision (97% commercial:3% recreational) and the yield at F_{OY}. Implement accountability measures (AMs) for the recreational sector for golden tilefish. If the ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing season by the amount necessary to ensure landings do not exceed the 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 3. Establish a *single* ACL (commercial and recreational) using the total of the commercial ACL (quota) at the F_{OY} level and the recreational allowable harvest at the OY level. The total ACL would be 326,554 lbs ww (291,566 lbs gw). The AM would prohibit harvest in the commercial and recreational sectors when the ACL is projected to be met.

Alternative 4. Establish a recreational accountability measure that would implement a 1 golden tilefish *per vessel* per day when the *single* ACL (the total of the commercial ACL (quota) at the F_{OY} level and the recreational allowable harvest at the OY level, 326,554 lbs ww (291,566 lbs gw)), is projected to be met.

Alternative 5. Establish an ACL (commercial and recreational) based on the yield at F_{OY} for the commercial fishery (282,819 lbs gw). The AM for the commercial and recreational sectors is to prohibit harvest, possession, and retention in both sectors when commercial landings exceed the ACL.

*Note: It is the Council's intent that all recreational closures in the South Atlantic are associated with a possession limit of zero on board a vessel for which any valid federal

South Atlantic Snapper-Grouper Permit has been issued, regardless of where such species were harvested, i.e., in state or federal waters.

Table 4-14. Commercial ACL and recreational ACL for Alternatives 2 and 5 under the various allocation alternatives specified in Section 4.2.1.

Allocation (Comm/Rec)	Comm ACL (quota) lbs gw (OY)	Rec ACL lbs gw (OY)	Rec ACL number (OY)
Alternative 2 (96%/4%)	279,903	11,663	2,103
Alternative 3 (**Preferred**) (97%/3%)	282,819	8,747	1,578
Alternative 4 (50%/50%)	145,783	145,783	26,293

4.2.2.1 Biological Effects

Alternative 1 (Status Quo) would maintain status quo regulations for golden tilefish. Snapper Grouper Amendment 13C established a 295,000 lb gutted weight commercial quota for golden tilefish at the yield associated with F_{MSY}, which was intended to end overfishing. Once the quota is projected to be met, all fishing for and/or possession of golden tilefish is prohibited. The recreational bag limit was reduced to 1 in the 3 grouper aggregate bag limit. The final NS1 guidelines acknowledge that existing FMPs may use terms and values that are similar to, associated with, or may be equivalent to OFL, ABC, ACL, ACT, and AM in many fisheries for which annual specifications are set for different stocks or stock complexes. In these situations the guidelines suggest that, as Councils revise their FMPs, they use the same terms as set forth in the NS1 guidelines.

Alternative 1 (Status Quo) would retain management measures that are equivalent to OFLs, ACLs, and AMs specified by the Reauthorized Magnuson-Stevens Act and in the final NS1 guidelines. Snapper Grouper Amendment 13C specifies an overfishing level for golden tilefish at the yield at F_{MSY}, which is equivalent to the OFL. The ACL serves as a catch limit for a species which triggers some sort of AM to ensure overfishing of a species does not occur. The ACL for the golden tilefish commercial sector is based on the commercial portion of the yield at F_{MSY}. No ACL was specified for the recreational sector; however, recreational catch of golden tilefish is minor (less than 9% in recent years; Table 4-15a). Amendment 13C established measures to reduce the chances that overfishing occurs by closing all commercial fishing for golden tilefish when the quota (commercial ACL) is projected to be met and can be considered to be equivalent to an AM. Therefore, **Alternative 1 (Status Quo)** for golden tilefish, which was determined to be based upon the best available science by the SSC, would end overfishing and satisfy the requirements of the Reauthorized Magnuson-Stevens Act for the commercial sector.

Table 4-15a. Landings (lbs whole weight) of golden tilefish in the commercial (Comm), headboat (HB), and recreational (MRFSS) fisheries.

Year	Comm	MRFSS	PSE	HB	% Comm	% Rec
1986	1,317,941	251	0	0	99.98%	0.02%
1987	370,437	44	0	79	99.97%	0.03%
1988	659,206	3,966	0	0	99.40%	0.60%
1989	993,302	0	0	14	100.00%	0.00%
1990	1,008,802	137	0	7	99.99%	0.01%
1991	1,066,839	179	65.7	0	99.98%	0.02%
1992	1,053,324	0	0	26	100.00%	0.00%
1993	1,144,283	0	0	0	100.00%	0.00%
1994	897,084	15,959	59.2	12	98.25%	1.75%
1995	751,861	0	0	0	100.00%	0.00%
1996	385,651	3,064	100	0	99.21%	0.79%
1997	401,454	16,703	88.1	968	95.78%	4.22%
1998	407,143	2,255	101	8	99.45%	0.55%
1999	549,334	4,409	78.3	8	99.20%	0.80%
2000	790,621	1,804	46.2	0	99.77%	0.23%
2001	478,529	26,801	59.2	0	94.70%	5.30%
2002	447,074	9,246	52.7	0	97.97%	2.03%
2003	295,333	28,030	41.7	0	91.33%	8.67%
2004	251,617	25,007	39.4	0	90.96%	9.04%
2005	315,812	240,240	40.3	0	56.80%	43.20%
2006	447,772	44,061	54.3	0	91.04%	8.96%
2007	342,755	4,782	0	0	98.62%	1.38%
2008	374,040	0	0	0	100.00%	0.00%

Note: PSE = percent standard error.

Alternatives 2 (Preferred), 3, 4, and **5** specify ACLs based on the F_{OY} level equal to the yield at 75% F_{MSY}. Values specified for F_{OY} assumes the stock is at equilibrium. SEDAR 4 (2004) indicated that although the stock was not overfished, current biomass was slightly less than SSB_{MSY}. However, actions were taken in Snapper Grouper Amendment 13C to immediately end overfishing of golden tilefish. If a future assessment indicates biomass remains at levels below SSB_{MSY}, adjustments would be made by framework to specify the yield at the F_{OY} level.

Alternative 2 (Preferred) would establish an ACL below the OFL and at 75% F_{MSY} (F_{OY} level). The commercial quota, which is also the commercial ACL, and recreational ACL would be dependent upon the allocation alternative selected in **Section 4.2.1** (Table 4-14). The AM for the commercial sector would be to close the fishery when the quota is projected to be met. If the ACL was exceeded in the recreational sector, the Regional Administrator would publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACL for the following fishing year.

However, it would be difficult to monitor the recreational component of the total ACL because recreational landings are small, encounter rates are few, and estimates of

recreational catch are extremely variable (Table 4-15a). Due to the variability in values available from MRFSS (Tables 4-15a), the recreational ACL would be compared with recreational landings over a range of years. Furthermore, ACL for the recreational sector would be based on numbers of fish rather than weight as numbers are less variable. The ACL provided by **Alternative 2 (Preferred)** would increase the chance that overfishing does not occur by providing a buffer between the OFL and the level at which the AM would be triggered.

Alternative 3 would establish a single ACL for the commercial and recreational sectors by using the total of the commercial ACL (quota) at the F_{OY} level and the recreational allowable harvest at the OY level. The total ACL would be 291,566 lbs gutted weight. When the single ACL is projected to be met, the AM would prohibit fishing for and/or retention of golden tilefish in the commercial and recreational sectors. However, it would be difficult to monitor the recreational component of the total ACL because recreational landings are small, encounter rates are few, and estimates of recreational catch are extremely variable (Table 4-15a). Therefore, the biological benefits of **Alternative 3** would exceed those under **Alternatives 1 (Status Quo)** but would be less than **Alternative 2 (Preferred)**, which would compare the recreational ACL with recreational landings over a range in years.

Alternative 4 would establish a recreational accountability measure that would implement a 1 golden tilefish per vessel per day limit when the single ACL is projected to be met. The AM for the commercial sector would be a closure when the quota is projected to be met. As some recreational harvest would be allowed after the ACL was met, the biological benefits of **Alternative 4** would be less than **Alternative 3**. Like **Alternative 3**, **Alternative 4** would require that the recreational portion of the ACL be tracked to determine when the overall ACL would be met, which would be difficult due to problems with tracking small amounts of landings and accurately estimating recreational catch.

Alternative 5 would overcome the difficulties identified in **Alternatives 2 (Preferred), 3,** and **4** with attempting to estimate a combined ACL by having a single ACL for the commercial and recreation sectors equal to the commercial quota at the F_{OY} level (282,819 lbs gutted weight). The commercial and recreational AM would be to prohibit harvest, possession, and retention in both sectors when the commercial ACL is met. Due to uncertainties in estimating recreational harvest, it would be assumed under **Alternative 5** that golden tilefish are caught in the recreational sector at the same rate as in the commercial sector. However, examination of monthly catch of golden tilefish in the commercial sector and catch by wave for MRFSS indicates that commercial fishermen may begin catching golden tilefish earlier in the year than recreational fishermen (Table 4-15b and 4-15c). Most golden tilefish are caught in the recreational sector during summer months when weather is better and it easier for fishermen to move offshore in the golden tilefish grounds. Therefore, under **Alternatives 5**, if commercial fishermen met the quota early in the year and the ACL in the various alternatives was met, it could reduce the chance for recreational fishermen to catch golden tilefish during the period of the year when they have historically targeted the species.

Table 4-15b. Landings of golden tilefish (numbers A + B1) by wave.

Wave	2005	2005 PSE	2006	2006 PSE	2007	2007 PSE	2008	2008 PSE
1	0	0	1,718	100	0	0	0	0
2	0	0	1,080	99	0	0	0	0
3	29,445	66	4,205	58	2,165	0	0	0
4	37,677	51.5	4,779	100	0	0	0	0
5	3,182	61.3	942	100	0	0	0	0
6	0	0	0	0	0	0	0	0

Note: Wave 1 = January-February; Wave 2 = March-April; Wave 3 = May-June; Wave 4 = July-August; Wave 5 = September-October; Wave 6 = November-December.
Source: MRFSS Web site. PSE = percent standard error.

Table 4-15c. Monthly landings of golden tilefish (lbs whole weight) caught by commercial fishermen during 2005-2008.

Month	2005	2006	2007	2008
1	1,023	31,010	38,265	93,763
2	16,301	25,581	59,368	44,368
3	18,920	25,478	55,434	48,358
4	29,270	57,336	64,942	78,042
5	28,666	74,438	17,782	61,013
6	31,524	43,907	5,263	7,822
7	15,030	14,700	7,335	8,390
8	16,288	43,093	35,174	17,417
9	37,138	52,804	48,424	52
10	55,156	67,783	364	136
11	39,228	0	110	14,578
12	27,268	259	12	101

Source: ALS data.

An overview of golden tilefish catch levels is shown in Table 4-15d. There are systems in place to track commercial landings, and the fishery is closed when the quota is projected to be met. There is a very low level of management uncertainty in our ability to track commercial landings and ensure the quota is not exceeded. There is a higher level of management uncertainty in our ability to track the recreational landings and ensuring the recreational ACL is not exceeded. The recreational catch was 0 and 4,782 pounds whole weight in 2008 and 2007 respectively (Table 4-15a). The recreational catch is not expected to exceed the recreational ACL (8,747 lbs gw) with a bag limit of 1 golden tilefish in the 3 grouper aggregate bag limit. Prohibiting fishing for deepwater species (other than golden tilefish) deeper than 240 feet will also limit the expected recreational catch.

Table 4-15d. Overview of catch levels (pounds gutted weight) for golden tilefish.

Yield @ MSY	Yield @ OY	ACL=OY	Com. ACL	Rec. ACL
300,380	291,566	291,566	282,819	8,747

Alternative 1 (Status Quo) would perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. **Alternatives 3-5** and **Alternative 2 (Preferred)** are unlikely to have adverse effects on ESA-listed *Acropora* species. Previous ESA consultations determined the snapper grouper fishery was not likely to adversely affect *Acropora* species. Establishing ACLs or AMs is unlikely to alter fishing behavior in a way that would cause new adverse effects to these species. The impact of **Alternatives 3 - 5** and **Alternative 2 (Preferred)** on sea turtles and smalltooth sawfish is uncertain. If the establishment of ACLs or AMs does not change the existing amount of fishing effort, but causes effort redistribution, any potential effort shift is unlikely to change the level of interaction between sea turtles and smalltooth sawfish and the fishery as a whole. If implementation of ACLs or AMs causes a reduction in fishing effort, the risk of interaction between ESA-listed species and the fishery will likely decrease.

4.2.2.2 Economic Effects

Commercial Sector

Amendment 17B proposes two management actions for tilefish, including an action to specify the ACL and an action to divide that ACL between the commercial and recreational sectors. Both actions affect the annual catch limit available to the commercial sector. Hence, they are evaluated jointly.

While the allowable catch action has five management alternatives and the allocation action has four alternatives, they reflect two management choices for TAC and four management choices for allocation. Allocation **Alternative 1 (Status-quo)** includes a TAC for the commercial sector at 295,000 lbs gutted weight , and all other alternatives are based on an allowable catch of 291,566 lbs gutted weight. Allocation **Alternative 2** specifies a commercial share of 96% of total allowable catch, while allocation **Alternative 3 (Preferred)** specifies a commercial share of 97% of the ACL and **Alternative 4** specifies a commercial share of 50% of the ACL. The implied commercial share for allocation **Alternative 1 (Status Quo)** was calculated as 98.2% of TAC based on the ratio of the existing commercial quota (295,000 lbs gutted weight) to the existing total allowable catch (300,380 lbs gutted weight). The management scenario with a commercial allocation of 97% (allocation **Alternative 3 (Preferred)**) and the ACL (golden tilefish ACL **Alternative 2 (Preferred)**) reflects the Council's preferred alternatives for golden tilefish.

From a modeling perspective, eight management scenarios were evaluated for golden tilefish, with each scenario representing a different combination of ACL and commercial share of the ACL. All scenarios retain the existing commercial trip limits of 4,000 lbs

gutted weight until 75% of the commercial ACL is taken. The trip limit is reduced to 300 lbs after 75% of the quota is taken, but only if this occurs on or before September 1.

Commercial landings of golden tilefish have fluctuated widely, with an historical peak of nearly 3.4 million lbs (gutted weight) in 1983. More recently, the commercial fishery landed 815,100 lbs (gutted weight) worth $1.2 million in 1993 and 692,700 lbs worth $1.4 million in 2000 (Figure 4-8).[5] The fishery also landed only 314,300 lbs worth $574,100 in 1996 and 243,200 lbs worth $510,200 in 2004. Landings averaged 305,300 lbs worth $772,700 from 2005-2008. Dockside revenues and pounds landed fluctuate in the same direction (Figure 4-8), which suggests that ex-vessel demand is price elastic. The policy implication is that regulations that reduce industry landings in the short-term are expected to reduce dockside revenues in the short-term. Conversely, dockside revenues are expected to increase over time if regulation successfully increases biomass and landings.

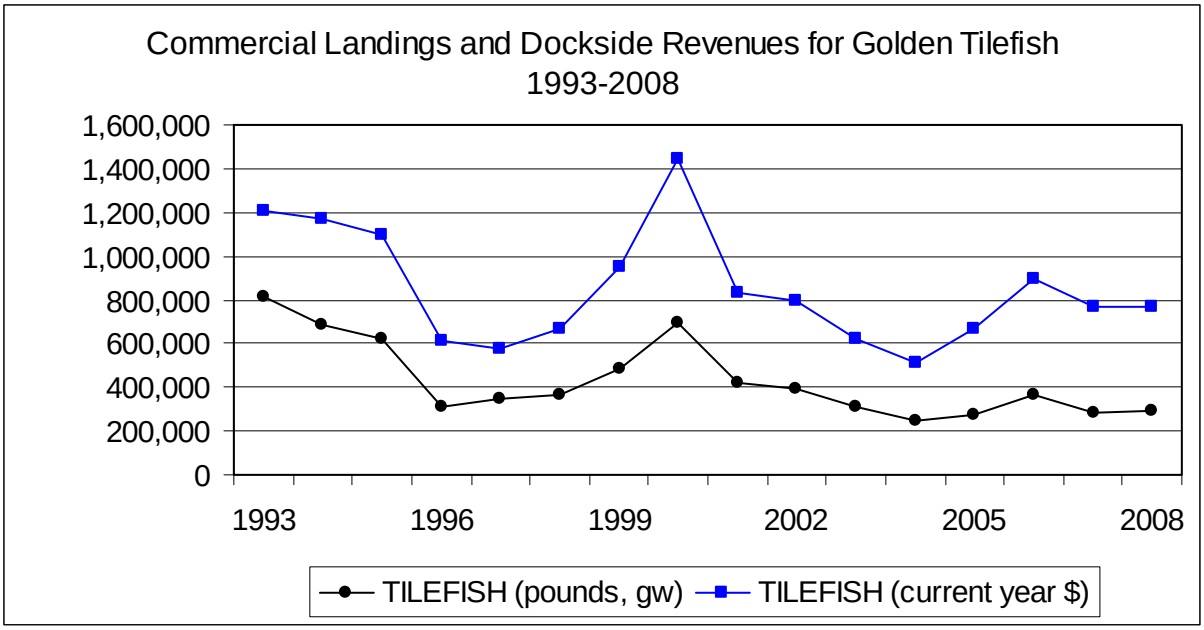


Figure 4-8. Commercial landings in federal waters: golden tilefish, 1993-2008.
Source: SEFSC logbook database as of June 29, 2009.

A commercial quota and trip limit were first implemented in 1994 by Snapper Grouper Amendment 6.[6] More restrictive management was implemented in October 2006 by Snapper Grouper Amendment 13C, including a commercial quota of 295,000 pounds

[5] Revenues are presented as current year dollars and have not been adjusted for inflation over time. Trip revenues were approximated as reported landings from the logbook database multiplied by average prices from the NMFS Accumulated Landings System.

[6] Snapper Grouper Amendment 6 specified a commercial quota in 1994 of more than 1.4 million lbs (gutted weight) and a trip limit of 5,000 lbs until the quota was filled and 300 lbs after the quota was filled. The quota declined to 1.2 million lbs in 1995 and 1.0 million lbs in 1996. The quotas were not filled (Figure 4-8).

gutted weight, the present tiered system of trip limits, and a bag limit of one golden tilefish.

The allocation and allowable catch alternatives in Amendment 17B are modeled as additional reductions in the commercial quota. The reductions are approximately 5% or less for most management scenarios not involving allocation **Alternative 4**, and range from 3,600 lbs (1.2%) for the scenario with allocation **Alternative 3 (Preferred)** and ACL **Alternative 1 (Status Quo)** to a 15,100 lb reduction (5.1%) for allocation **Alternative 2** and ACL **Alternative 2 (Preferred)**. The simulation model predicts that these reductions in commercial catch limits would generate an overall reduction in net operating revenues that ranges from approximately $3,500 to $12,500 or less than 0.15% to the entire snapper-grouper fishery (Figures 4-9a and 4-9b).

Larger reductions in the commercial catch limit are associated with allocation **Alternative 4**, which specifies a 50% commercial share. The commercial catch limit would decline by 144,800 pounds (49%) with ACL **Alternative 1 (Status Quo)** and by 149,200 lbs (50.6%) with ACL **Alternative 2 (Preferred)**. Net operating revenues for the entire commercial snapper-grouper fishery are predicted to decline by approximately $200,000 or 2.3% and $207,000 or 2.4% for these scenarios (Figures 4-9a and 4-9b). Boats that use bottom longlines are predicted to lose 35% and 36% of baseline net operating revenues, respectively. Although commercial landings of golden tilefish would decline by approximately 50%, the expected reductions in dockside revenues would be partially offset by lower operating costs as fewer trips would be taken. Losses would be incurred primarily by longline boats in central Florida and South Carolina (Figures 4-10a and 4-10b).

The economic effects of the golden tilefish alternatives differ due to differences in the magnitude of the commercial catch limit and the timing of the adjustment in the trip limit from 4,000 lbs to 300 lbs. Not surprisingly, the smaller the commercial catch limit, the greater the expected reductions in net operating revenues for commercial fishermen. In addition, the simulation model predicts that lower commercial catch limits would trigger the smaller trip limit at an earlier date each year.

The simulation model predicts that the system of trip limits will prevent the quota from being filled and the fishery from being closed, except for the scenarios with allocation **Alternative 4**. This contrasts with actual experience because the golden tilefish fishery was closed on October 23, 2006; October 3, 2007; and August 17, 2008. The fishery did not close in 2005 because Snapper Grouper Amendment 13C was not implemented until 2006. Although the simulation analysis did not use data for 2009, we note that the commercial fishery for golden tilefish was closed on July 15, 2009. The reason for this discrepancy between the observed closures and the simulation model's predictions is that landings as reported to the logbook database sum approximately to the commercial quota for 2006, 2007 and 2008, and that landings in 2005 were below average and below the quota specified by Amendment 13C. Therefore, the 4-year average for landings of golden tilefish falls short of the existing commercial quota. When combined with the

effects of the trip limits, simulated landings fall short of the proposed quotas, except for the management scenarios with a 50% commercial allocation.

A weakness of the simulation model is its reliance on historical fishery data to predict future fishing patterns when fishermen adjust to regulation over time. The failure of the model to predict closures for the golden tilefish fishery reflects the willingness and ability of fishermen to change their fishing patterns and strategies in response to regulation. In this case, fishermen are harvesting golden tilefish earlier in the fishing year. As a result, the model may under predict actual losses to the snapper-grouper fishery due to a smaller commercial quota for tilefish, but probably by only a small amount because the landings of golden tilefish are under predicted in the simulation of **Alternative 1 (Status Quo)** as well as in the simulation of the proposed management scenarios. Changes in the fishery due to the proposed alternatives in Snapper Grouper Amendment 17B are calculated as the difference between the outcomes of the proposed alternative and **Alternative 1 (Status Quo).**

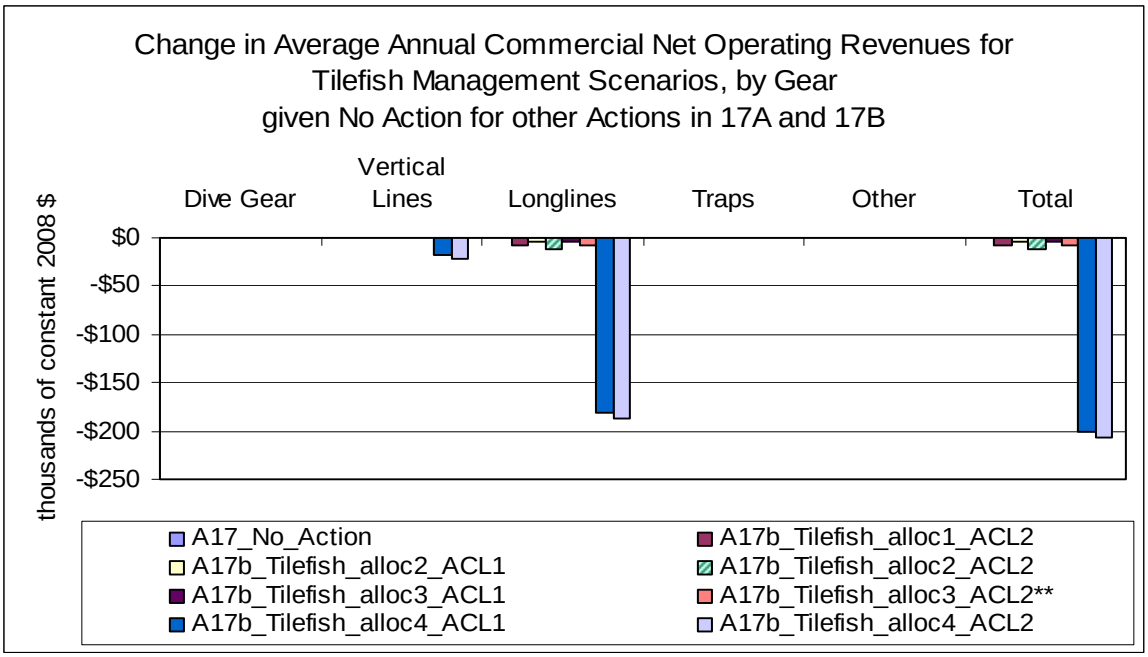


Figure 4-9a. Predicted change in commercial net operating revenues by gear type for golden tilefish alternatives compared to the No-Action alternative for Amendment 17B. Note: ** denotes the Council's preferred alternative.

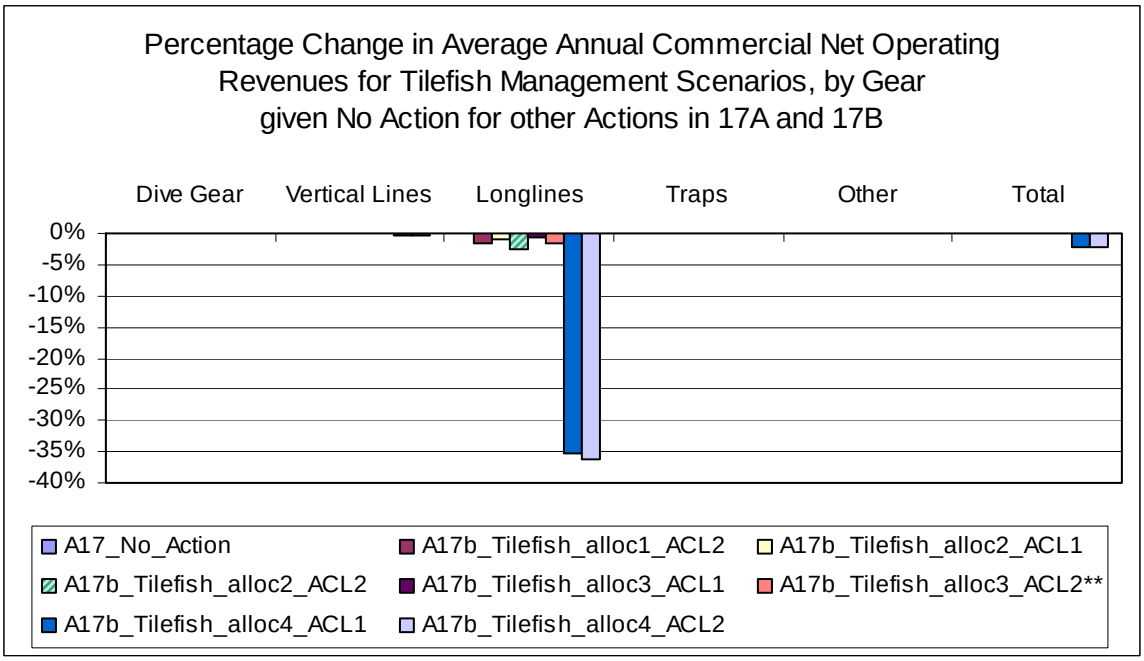


Figure 4-9b. Predicted percentage change in commercial net operating revenues by gear type for golden tilefish alternatives compared to the No-Action alternative for Amendment 17B.
Note: ** denotes the Council's preferred alternative.

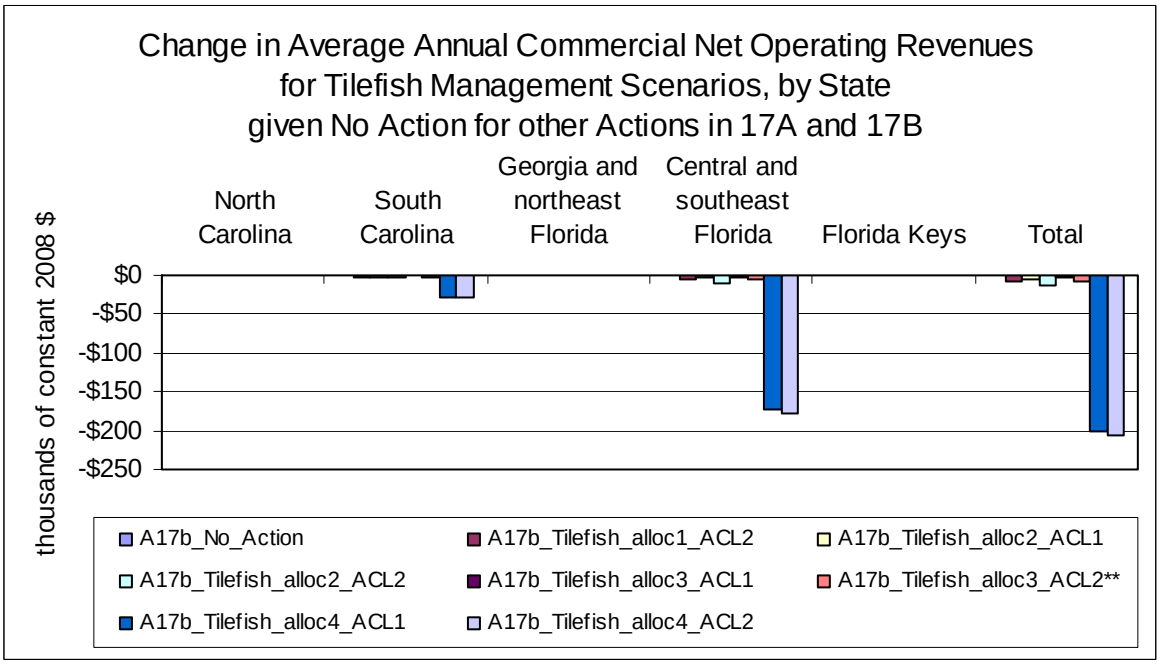


Figure 4-10a. Predicted change in commercial net operating revenues by state of landing for golden tilefish alternatives compared to the No-Action alternative for Amendment 17B.
Note: ** denotes the Council's preferred alternative.

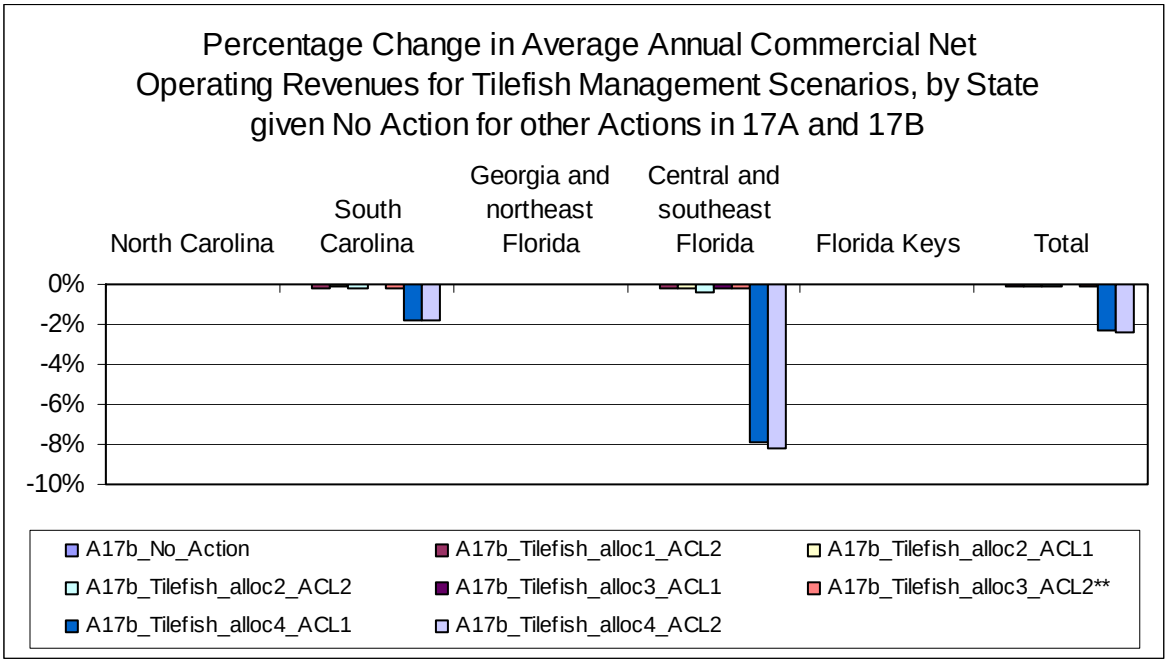


Figure 4-10b. Predicted percentage change in commercial net operating revenues by state of landing for golden tilefish alternatives compared to the No-Action alternative for Amendment 17B.
Note: ** denotes the Council's preferred alternative.

Recreational Sector

Alternative 1 (Status Quo), which provides for no recreational AMs, would be expected to have no short-term economic effects on this sector. The absence of an AM, however, can materially impair the effectiveness of management measures governing the golden tilefish fishery.

Alternative 2 (Preferred) would specify a recreational sector ACL based on the sector's allocation of the yield at F_{OY}, with implementation of an AM when the ACL is exceeded. Given the various allocation alternatives, the recreational ACL would be equivalent to 8,747 pounds gutted weight, 11,663 pounds gutted weight, or 145,783 pounds gutted weight. Based on 2005-2008 average recreational landings of 21.3 thousand pounds (Table 4-15e), the two low recreational ACLs would likely be exceeded even if landings were averaged over a number of years. It is likely that implementation of an AM would increasingly shorten the fishing season over the years. The high ACL, on the other hand, is very unlikely to be exceeded, and thus would afford the recreational sector more opportunities to derive more economic benefits from the fishery.

Alternative 3 would close the recreational fishery once the common commercial/recreational ACL of 291,566 pounds gutted weight is projected to be met. In 2005-2008, commercial landings averaged about 364.7 thousand pounds whole weight while recreational harvests averaged 21.3 thousand pounds whole weight, or a combined

total of 386 thousand pounds whole weight (Table 4-15d). With the ACL being about 85% of average commercial/recreational harvests, it is likely that the recreational sector, together with the commercial sector, would experience closures under **Alternative 3**. It is also possible the commercial sector would trigger closures of both sectors even assuming an inconsequential amount of recreational harvests.

Given the ACL of **Alternative 3**, implementing a one golden tilefish per vessel limit under **Alternative 4** would mitigate potential recreational sector losses under a single ACL. If only the commercial quota were monitored to trigger a closure, it is likely the closure would occur sometime in September of that particular year. As can be seen from Table 4-15e, the recreational sector would have harvested most of its usual harvests. The relatively small losses to the recreational sector under a September closure would even fall further under **Alternative 4**.

The ACL of 316,757pounds whole weight under **Alternative 5** would be about 83% of total commercial and recreational harvests. This ACL is slightly lower than that under **Alternative 3**, but otherwise both **Alternatives 3** and **5** would have similar economic implications on the recreational sector. This ACL would be exceeded and the recreational season closed.

Average landings information in Table 4-15e provides some general sense on when the various ACLs would possibly be reached and the fishery closed. The monthly recreational landings based on MRFSS were estimated by equally splitting a wave's landings into the relevant two months. Headboats registered no landings of golden tilefish.

Under ACL/AM **Alternative 2 (Preferred)**, depending on the allocation alternative chosen, the recreational ACL of 1,578 fish would be met sometime in June and the ACL of 11,663 pounds gutted weight would be reached in early to middle July. As noted earlier, the ACL of 145,783 pounds gutted weight would unlikely be met. For the years 2005-2008, it was only in 2005 that the recreational sector landed substantially more golden tilefish than its average. In 2005, the recreational sector registered landings of about 67 thousand pounds whole weight by the end of July. This one year's recreational landings is unlikely to be repeated in the near future, given the various regulations that have recently been implemented or would be implemented in the near future. The single ACL of 326,554 pounds whole weight under **Alternative 3** would be reached towards the end of September. By then, the recreational sector would have landed about 98% of its average landings. Under **Alternative 4**, the recreational sector would not experience closures or shortened season, but the AM of 1 fish per vessel per day would likely be imposed starting October. The single ACL of 316,757 pounds whole weight under **Alternative 5** would be reached towards the middle of September when the recreational sector would have landed slightly less than 98% of its average landings.

Table 4-15e. Average monthly commercial and recreational landings of golden tilefish, in thousand pounds whole weight, 2005-2008.

	Comm.	Rec.	Total	Comm. Cumulative	Rec. Cumulative	Total Cumulative
January	41.0	0.2	41.2	41.0	0.2	41.2
February	36.4	0.2	36.6	77.4	0.4	77.8
March	37.0	0.1	37.2	114.5	0.6	115.0
April	57.4	0.1	57.5	171.9	0.7	172.6
May	45.5	4.5	50.0	217.3	5.2	222.5
June	22.1	4.5	26.6	239.5	9.7	249.1
July	11.4	5.3	16.7	250.8	15.0	265.8
August	28.0	5.3	33.3	278.8	20.3	299.1
September	34.6	0.5	35.1	313.4	20.8	334.2
October	30.9	0.5	31.4	344.3	21.3	365.6
November	13.5	0.0	13.5	357.8	21.3	379.1
December	6.9	0.0	6.9	364.7	21.3	386.0
Total	364.7	21.3	386.0			

Estimates of reductions in consumer surplus and charterboat net operating revenues due to the various alternatives are presented in Table 4-15f. Headboats are unlikely to be affected due to the absence of headboat landings of and targeted trips for golden tilefish.

Alternative 2 (Preferred), when combined with the allocation alternatives, provides for 3 ACLs, but only the lower two would likely result in adverse economic effects as shown in Table 4-15f. The positive effects of the third ACL cannot be estimated. The estimated economic effects of the two ACLs of **Alternative 2 (Preferred)** are incurred the following year after the ACL is reached. In addition, the following year's shortened season is assumed to consist of closing all consecutive months after the ACL is reached in the prior year. It is to be noted that the effects of the two ACLs for **Alternative 2 (Preferred)** and the ACL for **Alternative 5** would be the same, since the affected trips would be the same. The adverse economic effects of **Alternative 3** are substantially lower than those of the two lower ACLs of **Alternative 2 (Preferred)**. Nevertheless, considering that there is only a single ACL under **Alternatives 3**, the possibility exists for the commercial fishermen to alter their fishing behavior, such as fishing more intensively in the first months of the fishing year. In this eventuality, the fishery may be closed earlier, resulting in more losses to the recreational sector than shown in the table. In addition, if the recreational landings were not adequately monitored, a fishery closure would occur only after the recreational sector has reached its usual level of harvests. This could result in practically no losses to the recreational sector in the current year but more losses in subsequent years if the single ACL is reduced in the following year. A similar situation could also occur under the single ACL of **Alternative 5**.

In general, the larger the short-term negative impacts are on the recreational (and commercial) sector, the more positive long-term effects can be expected. Naturally, this would depend on how the measures, including monitoring and enforcement, are successful in generating higher stock levels that would be supportive of higher recreational fishing opportunities.

Table 4-15f. Reductions in consumer surplus and net operating revenues from the various recreational ACL/AM for golden tilefish.

	Charterboats	Private/Rental	Total
	*ACL/AM Alternative 2: ACL of 9,796 pounds whole weight; closure starts in July**		
Consumer surplus	$55,670	$132,922	$188,592
Net operating revenue	$7,008		$7,008
Total	$62,678	$132,922	$195,600
	*Allocation Alternative 2: ACL of 13,062 pounds whole weight; closure starts in August**		
Consumer surplus	$55,670	$132,922	$188,592
Net operating revenue	$7,008		$7,008
Total	$62,678	$132,922	$195,600
	Alternative 4: single ACL of 326,554 pounds whole weight; closure starts in October		
Consumer surplus	$27,835	$66,461	$94,296
Net operating revenue	$3,504		$3,504
Total	$31,339	$66,461	$97,800
	Alternative 5: single ACL of 316,757 pounds whole weight; closure starts in September		
Consumer surplus	$55,670	$132,922	$188,592
Net operating revenue	$7,008		$7,008
Total	$62,678	$132,922	$195,600

*The AM for Alternative 2 involves a reduction in fishing season the following year and not an immediate fishery closure.

4.2.2.3 Social Effects

A discussion of the general effects of ACLs and AMs in provided in **Section 4.0** and is incorporated herein by reference.

Alternative 1 (Status Quo) would retain the existing regulations for golden tilefish and allow the commercial sector to continue to harvest the current quota, 331,000 pounds whole weight (295,000 pounds gutted weight). The commercial quota would effectively constitute the ACL for the commercial fishery, which would be closed when the quota/ACL was met. **Alternative 1 (Status Quo)** would allow for the highest ACL for the commercial sector among the alternatives considered, which in the short-term would benefit commercial fishermen and communities with the highest landings of golden tilefish, such as Cocoa Beach, Fort Pierce, and Port Orange, Florida. As stated in the biological effects discussion, **Alternative 1 (Status Quo)** would end overfishing and satisfy this aspect of the requirements of the Reauthorized Magnuson-Stevens Act.

However, **Alternative 1 (Status Quo)** would not satisfy the ACL and AM requirements. The ACL and AM for a resource needs to reflect the entire fishery. This can be accomplished either by specifying a global ACL and AM, which accounts for harvest by all sectors, or by specifying sector-specific ACLs and AMs. Although the current commercial quota and prohibition on continued harvest once the quota is met satisfies specification requirements for the commercial sector, they do not cover the recreational sector. As a result, the absence of a recreational ACL or AM for golden tilefish under this alternative results in **Alternative 1 (Status Quo)** not being a viable long-term option. Additional subsequent management action, with duplicative administrative costs, would be required to address this deficiency. Additionally, while the absence of these controls may benefit the recreational sector in the short-term, two issues arise. The first issue is that the absence of an ACL and AM for the recreational sector could lead to over-harvest of golden tilefish and precipitate stricter harvest measures in the long-term for both the commercial and recreational sectors, with associated adverse social and economic effects. The second issue deals with equity. Although the recreational golden tilefish fishery has historically been a relatively minor fishery compared to the commercial fishery, one allocation alternative would apportion equal shares of the resource to both sectors. The absence of a harvest limit and accountability measures for a sector with equal access to the resource would not be expected to be viewed by those associated with the commercial sector, or the environmental community in general, as equitable and responsible management. Even if the allowable harvest is allocated along historic patterns, the absence of appropriate harvest constraints and accountability measures may be similarly viewed as irresponsible management in view of the capacity of unchecked recreational harvests to exceed historic harvest levels. Therefore, as previously stated, while subsequent action would need to be taken to enact the necessary protection, such would be redundant to the current management action and opportunity, incurring a duplication of time and resources to accomplish what could be accomplished under the current amendment.

Alternative 2 (Preferred) would establish separate ACLs and AMs for both the commercial and recreational golden tilefish fisheries, thereby eliminating the potential harvest overage or equity issues associated with **Alternative 1 (Status Quo).** The AMs for the two sectors, however, differ in recognition of the different abilities to monitor harvests in real time. The AM for the commercial sector would be the same as under the status quo, such that harvests are quota-monitored and further harvest is prohibited when the quota is projected to be met. For the recreational sector, however, where final annual harvest data are not available until the subsequent fishing year, any overage in the previous year would be reflected in a reduced fishing year the subsequent year. Further, such evaluation would be based on, eventually, the most recent three-year running average. While this system would ensure the recreational sector remained responsible for its performance, a possible negative outcome could be substantial reduction in the length of the current fishing year, with associated short-term reductions in social benefits, due to the narrow prescriptive nature of the accountability measure, which would allow only the season length to be adjusted. Further, while the corrective action would attempt to prevent further overage, no pay-back provision (reducing the harvest by the amount of the overage) would be included. Although periodic stock assessments would be

conducted and would account for the biological impacts of any overages, recreational overages could result in deteriorating stock conditions, or failure to meet recovery goals, where appropriate, resulting in decreased social and economic benefits for both the recreational and commercial sectors.

Beyond the difference in AMs for the recreational sector, the primary difference between **Alternative 2 (Preferred)** and **Alternative 1 (Status Quo)** is the potential respective sector ACLs. Under **Alternative 2 (Preferred)**, the ACLs, whether denoted in pounds (commercial sector) or fish (recreational sector), would depend on the allocation selected. In all allocation scenarios, the commercial sector would experience a reduction in the ACL compared to **Alternative 1 (Status Quo)**, though under three of the allocation scenarios (allocation **Alternatives 2-4** and, effectively, **Allocation Alternative 1 (Status Quo)** because **Alternatives 2** and **4** mirror historic harvest patterns), the maximum reduction would be only approximately 5% (279,903 pounds gutted weight under allocation **Alternative 3** compared to the current quota/ACL of 295,000 pounds gutted weight). Thus, while there would be some reduction in allowable harvest, any associated social or economic effects would likely be minor. However, allocation **Alternative 5** would result in a 50% allocation of allowable harvest to each sector, which would represent a substantial reduction in the commercial ACL (and increase in the recreational allowable harvest compared to historic harvest levels) from the status quo. While this change, and associated adverse social effects, would be specifically due to the change in allocation, it is relevant to note here because **Alternative 2 (Preferred)** (and ACL **Alternative 5**) would establish sector-specific ACLs, whereas **Alternatives 3** and **4** would establish a single fishery-wide ACL, thereby negating the potential adverse effects of an allocation that substantially deviates from historic harvest patterns.

As stated in the previous paragraph, **Alternative 3** (and **Alternative 4)** would establish a single, and equal, ACL for golden tilefish that covers harvest in both the commercial and recreational sectors. This ACL would be slightly more than would be allowed under **Alternative 2 (Preferred)**, but still less than under **Alternative 1 (Status Quo)**. As a single, whole-fishery ACL, under which the entire fishery would close when the ACL is projected to be met, either sector could increase harvests, relative to historic harvest levels, at the expense of the other. While the sector, and associated businesses and communities, with increased harvests would benefit, the other sector would not. Given the differences in harvest monitoring potential, an accelerated in-season closure may more likely be due to increased commercial harvests, such that the recreational sector also closes, with associated negative effects, even though actual recreational harvest information is not available. While the recreational fishery may get closed earlier than it otherwise would if managed separately, it is unlikely that this would result in any biological benefit to the resource. The theory of biological benefit would be, because harvest monitoring of the recreational sector is uncertain and not real time, early closure of the recreational sector may result in lower overall harvest in the given year. Also, it could be argued that early recreational closure may be successful in preventing harvest overages that are not identified until the subsequent year, thereby reducing the adverse effects of corrective action the subsequent year (corrective action need not be payback; because a closure date would include expectations of projected harvests as well as actual,

accelerated harvests in the previous year or years would be incorporated in current year projections, effectively constituting a corrective action). The reality of either event is speculative at best. Further, actual total harvest will still be determined when final data are available, such that long-term biological neutrality will be preserved (allowable harvests will be increased or decreased according to stock growth or harvest overages). In the long term, this alternative primarily would simply allow a functional reallocation of social and economic benefits according to the intentional or circumstantial harvest aggressiveness of the competing sectors.

The effects of **Alternative 4** would be expected to mirror those of **Alternative 3** except for one key difference. **Alternative 3** would close the entire fishery when the ACL was projected to be met; whereas, **Alternative 4** would allow the recreational fishery to remain open under a one-fish per vessel daily bag limit. While this would allow the recreational sector to avoid the in-season loss of benefits associated with an earlier than expected closure due to accelerated commercial harvests, such would result in continued harvest in excess of the ACL, with potential adverse stock effects that would eventually have to be repaid through reduced total harvest levels. As a result, while the recreational sector would benefit in the short-term, corrective action to address biological issues could result in decreased long-term social and economic benefits to the entire fishery.

The effects of **Alternative 5** would be expected to mirror those of **Alternative 3** except that the total ACL would be smaller as it would be based solely on the commercial allocation. Hence, whereas under **Alternative 3** the ACL would be 291,566 pounds gutted weight, under **Alternative 5** the ACL could range from 145,783-282,819 pounds gutted weight, depending on the allocation selected. As a result, the adverse social and economic effects of **Alternative 5** would be expected to be greater than those of **Alternative 3**. Although not a substantive fishery, the recreational sector may get penalized the most as the commercial sector, regardless of allocation, may have the greatest incentive to ensure they get their allocation, resulting in accelerated commercial harvests and early closure of the fishery at the expense of the recreational sector. While some biological benefit may be gained with the ACL based only on historic commercial harvests, particularly under equal sector allocations, because the resource is neither overfished nor undergoing overfishing, there is no basis to assume long-term social and economic gains would compensate for the short-term losses associated with more conservative allowable harvests.

Given the qualitative nature of the expected effects and the uncertainty of what may actually occur compared to what is possible, strict ranking of the alternatives is not possible. While **Alternative 1 (Status Quo)** would allow the largest total harvest, which would suggest the greatest amount of social benefits as long as the stock is adequately protected, equity issues arise as the recreational sector would not be subjected to the same harvest control or accountability measures as the commercial sector. **Alternative 2 (Preferred)** would establish limits and sector-specific accountability measures, eliminating the equity issues of **Alternative 1 (Status Quo)**, but would reduce the overall allowable harvest. Although **Alternative 3** would allow the same total harvest as **Alternative 2 (Preferred)**, it would be expected to result in lower social benefits because

it would allow one sector to gain at the expense of the other and would require no individual sector accountability. **Alternative 4** would be expected to result in greater social benefits than **Alternative 3** in the short-term, but may result in greater adverse long-term effects if harvest overages degrade the resource. **Alternative 5** may result in the lowest social benefits of all the alternatives considered because of the possibility that the fishery may be restricted to half of its total annual average historic harvests.

4.2.2.4 Administrative Effects

Specifying the current quota as the golden tilefish ACL under **Alternative 1 (Status Quo)** would be the least burdensome of all the alternatives since the quota has already been implemented and quota monitoring already exists. However, no AM would be established for the recreational sector under **Alternative 1 (Status Quo),** which may result in the ACL being exceeded. **Alternative 2 (Preferred)** would require tracking the commercial and recreational landings every year, which would be averaged over three years on a continuous basis for the recreational sector. The tracking of recreational landings can be challenging and would likely impose a burden on the administrative environment. Other administrative burdens that may result from all of the alternatives considered would take the form of development and dissemination of outreach and education materials for fishery participants, and in the case of **Alternative 4**, enforcement of a 1 fish per vessel per day limit. Overall, enforcement of **Alternatives 2 (Preferred)** through **Alternative 5** would not exceed or add to status quo enforcement costs or effort for this fishery.

4.2.2.5 Council's Conclusion

The Snapper Grouper Advisory Panel (AP) discussed the action to compare the recreational ACL with projected recreational landings over a range of years. The AP recommended that the 3 year running average be replaced with a five year average (drop the low and high number) in terms of recreational golden tilefish landings (10 for, 1 against, and 3 abstentions).

The Law Enforcement Advisory Panel did not have any recommendations.

The Scientific and Statistical Committee (SSC) noted that the existing assessment is old and inappropriate to rely on for derivation of ABC. Thus, they could not determine with any degree of certainty that the measures proposed in Amendment 17B will end overfishing. For this species (as well as others, e.g. snowy grouper, with small recreational allowances) the SSC is concerned that in-season monitoring of the recreational ACL will depend largely on the MRFSS (MRIP), which reports data in 2-month waves, with a 6-week to 2-month lag time. Data invariably will be scarce and large expansion factors may trigger AMs based on small numbers of fish.

The Council selected **Alternative 2** as their preferred alternative. **Alternative 2 (Preferred)** would establish a commercial ACL at the F_{OY} level. The commercial

ACL/quota would be 282,819 pounds gutted weight. The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is met. All purchase and sale is prohibited when the commercial ACL is met. **Alternative 2 (Preferred)** would also specify a recreational ACL of 1,578 fish and would implement AMs for the recreational sector for golden tilefish. If the recreational ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing season by the amount necessary to ensure landings do not exceed the sector ACL for the following fishing year. The recreational ACL of 1,578 fish would be compared with recreational landings over a range of years. For 2010, only 2010 landings would be used. For 2011, average landings of 2010 and 2011 would be used. For 2012 and beyond, the most recent three-year running average would be used. **Alternatives 2 (Preferred)** would establish ACLs based on the yield associated with F_{OY}, which is a more conservative approach to rebuilding the fishery since F_{OY} is 75% of F_{MSY}. Biologically, this more conservative approach for species undergoing overfishing is preferable since the ACL provided by **Alternative 2 (Preferred)** would increase the chance that overfishing does not occur by providing a buffer between the OFL and the level at which the AM would be triggered.

The Council recognizes it will be difficult to monitor the recreational catch. However, based on catches in 2007 and 2008 and the expected reductions in catch from the reduced bag limit and closure beyond 240 feet, the Council concluded the recreational catch will be below their ACL (Table 4-15d).

The Council concluded the preferred alternative is sufficient to end overfishing of golden tilefish, that this action meets the new Magnuson-Stevens Act requirements for tilefish, and the preferred alternative meets the SSC's recommendations. While the SSC did not specify ABC due to the age of the assessment, the Council's ACL is based on 75% of F_{MSY} which is a conservative approach. The Council also concluded the preferred alternative best meets the goals and objectives of the Snapper Grouper FMP as amended.

4.3 Snowy grouper

Alternative 1 (Status Quo). Retain existing regulations for snowy grouper. The commercial ACL (82,900 lbs gw) is based on the current TAC of 102,960 lbs ww (87,254 lbs gw), which is based on the yield at F_{OY}. The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is projected to be met. All purchase and sale is prohibited when the quota is projected to be met. The recreational ACL equals 523 fish. Do not implement AMs for the recreational sector. Do not implement an ACT for the commercial or recreational sector.

Alternative 2 (Preferred). Establish a recreational daily bag limit of 1 snowy grouper *per vessel*. Implement accountability measures (AMs) for the recreational sector for snowy grouper. If the recreational ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing season by the amount necessary to ensure landings do not exceed the recreational 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 3. Establish a single ACL (commercial and recreational) based on the current TAC of 102,960 lbs ww (87,254 lbs gw). The AM for both sectors would be a closure when the ACL is projected to be met.

Alternative 4. Establish a recreational AM that would implement a 1 snowy grouper *per vessel* limit when the ACL (the commercial quota) is projected to be met. The AM for the commercial sector would be closure when the quota is projected to be met.

*Note: It is the Council's intent that all recreational closures in the South Atlantic are associated with a possession limit of zero on board a vessel for which any valid federal South Atlantic Snapper-Grouper Permit has been issued, regardless of where such species were harvested, i.e., in state or federal waters.

4.3.1 Biological Effects

Revisions to the Magnuson-Stevens Act in 2007 require that by 2010, Fishery Management Plans (FMPs) for fisheries determined by the Secretary to be subject to overfishing must establish a mechanism for specifying ACLs at a level that prevents overfishing and does not exceed the recommendations of the respective SSC or other established peer review processes. These FMPs also are required to establish within this time frame measures to ensure accountability. Terms including OFL, ABC, ACT, and AM are defined in **Section 4.0**.

Alternative 1 (Status Quo) would maintain the status quo for snowy grouper. Snapper Grouper Amendment 13C established a commercial quota that stepped down over three

years to 84,000 lb gutted weight, the yield associated with 75%F_{MSY}. Once the quota is projected to be met all fishing for, possession, and retention of snowy grouper is prohibited. Snapper Grouper Amendment 15A, which was implemented in 2008, specified a rebuilding strategy, which holds the catch levels steady while the stock rebuilds. Snapper Grouper Amendment 15B allocated 95% of the total allowable catch to the commercial sector and 5% to the recreational sector. Amendment 15B implemented a commercial quota of 82,900 lbs gutted weight and a recreational allocation of 523 fish (4,400 lbs gutted weight). These measures were approved by the Council's SSC and the SEFSC with the intent of ending overfishing and rebuilding the stock.

The final NS1 guidelines recognize that existing FMPs may use terms and values that are similar to, associated with, or may be equivalent to OFL, ABC, ACL, ACT, and AM in many fisheries for which annual specifications are set for different stocks or stock complexes. In these situations the guidelines suggest that, as Councils revise their FMPs, they use the same terms as set forth in the NS1 guidelines.

Alternative 1 (Status Quo) would retain management measures that are equivalent to OFLs, ABCs, ACLs, and AMs specified by the Reauthorized Magnuson-Stevens Act and in the final NS1 guidelines. Amendment 15A specifies an overfishing level for snowy grouper at the yield at F_{MSY}, which is equivalent to the OFL. Amendment 15A also specifies a rebuilding plan for snowy grouper that holds catch levels steady while the stock rebuilds. The catch level for snowy grouper in 2009 will approximate the yield at 75% F_{MSY} in 2009 and will drop below that level as the stock rebuilds. The catch level specified in the rebuilding plan would be equivalent to the ABC as recommended by the SSC at their December 2008 meeting.

The ACL serves as a catch limit for a species which triggers some sort of AM to ensure overfishing of a species does not occur, or corrects for some overage of an ACL. The ACLs for the commercial and recreational sectors for snowy grouper are based on the yield at 75%F_{MSY} as specified in Snapper Grouper Amendment 15B where the ACL for the commercial sector is the commercial quota and the recreational ACL is 523 fish. Snapper Grouper Amendments 13C and 15A established measures to reduce the chances that overfishing occurs by closing all commercial fishing for snowy grouper when the quota (commercial ACL) is projected to be met and can be considered to be equivalent to an AM. An AM for the recreational sector was not specified in Amendments 13C or 15A. Therefore, **Alternative 1 (Status Quo)** for snowy grouper, which was determined to be based upon the best available science by the SSC, would end overfishing and satisfy the requirements of the Reauthorized Magnuson-Stevens Act if future harvest is kept below the sector ACLs.

However, if future recreational harvest trends are at the same level or greater as those in recent years, then **Alternative 1** (**Status Quo)** could have negative effects to the stock and impose a risk of overfishing (Table 4-16). Sustainability of the stock could be compromised without a system of accountability measures that mitigate overages of the recreational ACL if it is exceeded.

Table 4-16. Recreational harvest of snowy grouper from 2005 through 2008.

Year	Private recreational and charter total catch (number of fish)	PSE	Headboat (number of fish)
2005	10,935	60.3	347
2006	13,487	31.5	97
2007	3,771	44.4	195
2008	1,770	34.1	53

Source: MRFSS and Headboat Survey.

Alternative 2 (Preferred) would establish a recreational daily bag limit of 1 snowy grouper per vessel per day. If the recreational ACL (523 fish) is exceeded, the Regional Administrator would reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACL the following year. In order to overcome the challenges of monitoring such a low and highly variable level of recreational landings of snowy grouper, the recreational ACL would be compared with the actual recreational landings over a range of years. For 2010, only 2010 landings would be used. For 2011, the average of 2010 and 2011 landings would be used. For 2012 and beyond, the most recent three year running average would be used.

Bag limits are designed to reduce fishing mortality by reducing the number of fish landed and the amount of time spent pursuing a species. When properly designed, bag limits are generally expected to benefit the environment in the short-term and long-term by limiting the extent to which a stock is targeted. However, the extent to which such benefits are realized depends on if and to what extent fishing effort changes or shifts in response to the selected management measure. For example, discard mortality can limit the amount by which fishing mortality is reduced by bag limits if fishermen continue to target co-occurring species after the catch quota or limit has been achieved.

Since release mortality of snowy grouper is considered to range from 90-100%, a smaller bag limit would provide little reduction in fishing mortality if fishermen continued to target snowy grouper, because the vast majority of released fish would likely die from the trauma of capture. **Alternative 2 (Preferred)** would change the snowy grouper bag limit implemented through Snapper Grouper Amendment 13C from 1 fish per *person* per day to 1 fish per *vessel* per day. Since recreational landings of the species are generally low compared to the commercial sector, any recreational fishing mortality reduction realized under this alternative is likely to be negligible relative to overall fishing mortality reductions needed to rebuild the stock. Therefore, the key to reducing fishing mortality of snowy grouper in the recreational sector is to remove the incentive to target the species, which **Alternative 2 (Preferred)** may help to accomplish. The reduction in the bag limit to 1 fish per person per day in 2006, appears to have reduced the recreational catch as MRFSS landings decreased from 13,487 fish in 2006 to 3,771 and 1,770 in 2008 and 2009, respectively (Table 4-16). However, estimated catch is above the proposed ACL of 523 fish.

One factor that may have a greater impact on harvest reductions of snowy grouper is **Alternative 4 (Preferred)** under Action 1 of this amendment to reduce harvest of speckled hind and warsaw grouper (**Section 4.1**). The Action 1 preferred alternative would prohibit fishing for, possession, and retention of deepwater snapper grouper species (snowy grouper, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper beyond the depth of 240 feet (73 m). Snowy grouper utilize a wide range of depths throughout their life cycle, 98-1,722 ft (30-525 m). Adults occur offshore over rocky bottom habitat (Heemstra and Randall 1993), and like speckled hind and warsaw grouper, they migrate to greater depths as they mature. Therefore, if **Alternative 4 (Preferred)** under Action 1 in this amendment is implemented through rulemaking, there is a high probability that sexually mature snowy grouper would also be protected. Such protection could lead the stock to rebuild faster than its current rebuilding schedule. The selection of **Alternative 4 (Preferred)** under Action 1 would also increase the chance the recreational allocation of 523 fish would not be exceeded.

Alternative 3 would establish a single ACL for the commercial and recreational sectors by using the total of the commercial ACL (quota) at the F_{OY} level and the recreational allowable harvest at the OY level. The total ACL would be 87,254 lbs gutted weight. When the single ACL is projected to be met, the AM would prohibit fishing for or retention of snowy grouper in the commercial and recreational sectors. **Alternative 3** would have less of a biological benefit since it would only prohibit harvest after the ACL is projected to be met, and would not account for any overages of the ACL in subsequent fishing years. Under **Alternative 3**, it would be difficult to monitor the recreational component of the total ACL because recreational landings are small, encounter rates are few, and estimates of recreational catch are extremely variable (Tables 4-17a-17c). **Alternative 2 (Preferred)** prescribes a sound method for dealing with this recreational catch data uncertainty and provides a means by which any recreational overages may be accounted for in subsequent fishing years. Therefore, **Alternative 2 (Preferred)** would be more biologically beneficial than **Alternative 3**.

Table 4-17a. Landings (lbs whole weight) of snowy grouper in the commercial (Comm), headboat (HB), and recreational (MRFSS) fisheries.

Year	Comm	HB	MRFSS	MRFSS PSE	% Comm
2001	339,431	953	39,248	47	89%
2002	316,408	578	8,512	66	97%
2003	298,248	467	13,417	76	96%
2004	268,150	388	26,526	46	91%
2005	263,378	1,617	31,656	93	89%
2006	274,181	669	166,901	34	62%
2007	142,547	308	26,973	48	84%
2008	95,742	91	14,919	65.9	86%

Note: PSE = percent standard error.

Alternative 4 would establish a recreational AM that would reduce the current bag limit of 1 snowy grouper per *person* per day to 1 snowy grouper per *vessel* per day when the

commercial ACL is projected to be met. The AM for the commercial sector would be a closure when the quota is projected to be met. Since some recreational harvest would be allowed after the ACL is met, and there would be no built-in mechanism to account for overages, the biological benefits of **Alternative 4** would be less than **Alternative 2 (Preferred)** and **Alternative 3.** When ranked in order from the least to greatest biological benefits for the recreational sector, the alternatives considered can be arranged as follows: **Alternative 1 (Status Quo)**; **Alternative 3**; **Alternative 4**; and **Alternative 2 (Preferred)**.

Alternative 1 (Status Quo) would perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. **Alternative 2 (Preferred)** and **Alternatives 3** and **4** are unlikely to have adverse effects on ESA-listed *Acropora* species. Previous ESA consultations determined the snapper grouper fishery was not likely to adversely affect *Acropora* species. Establishing ACLs or AMs is unlikely to alter fishing behavior in a way that would cause new adverse effects to these species. The impact of **Alternative 2 (Preferred)** and **Alternatives 3** and **4** on sea turtles and smalltooth sawfish is uncertain. If the establishment of ACLs or AMs does not change the existing amount of fishing effort, but causes effort redistribution, any potential effort shift is unlikely to change the level of interaction between sea turtles and smalltooth sawfish and the fishery as a whole. If implementation of ACLs or AMs causes a reduction in fishing effort, the risk of interaction between ESA-listed species and the fishery will likely decrease.

Table 4-17b. Landings of snowy grouper (numbers A + B1) by wave.

Wave	2005	2005 PSE	2006	2006 PSE	2007	2007 PSE	2008	2008 PSE
1	0	0	0	0.0	0	0	0	0
2	276	59.4	119	61.7	340	74.4	147	47.3
3	141	99.7	13,090	32.4	637	78.7	0	0
4	5,097	91.7	252	99.5	1,772	50.5	812	66
5	4,573	100	0	0	1,367	98.5	301	60.5
6	850	99.6	85	100	498	54.4	509	39.1

Source: MRFSS Web site. PSE = percent standard error.
Note: Wave 1 = January-February; Wave 2 = March-April; Wave 3 = May-June; Wave 4 = July-August; Wave 5 = September-October; Wave 6 = November-December.

Table 4-17c. Monthly landings of snowy grouper (lbs whole weight) caught by commercial fishermen during 2005-2008.

Month	2005	2006	2007	2008
1	14,640	12,750	7,220	10,822
2	20,536	27,255	4,821	4,381
3	23,715	31,640	18,066	5,712
4	41,274	47,862	20,133	10,537
5	46,594	46,886	16,854	10,413
6	26,756	42,329	26,750	9,953
7	26,685	32,728	13,382	12,231
8	14,309	16,530	11,573	12,912
9	14,236	10,221	8,910	6,926
10	9,725	5,882	6,252	2,537
11	13,123	21	3,956	7,866
12	11,785	77	4,630	1,452

Source: ALS data.

4.3.2 Economic Effects

Commercial Sector

Alternative 1 (Status Quo), which maintains the commercial quota of 82,900 pounds gutted weight, would not be expected to have any short or long-term economic effects on the commercial sector.

Alternative 2 (Preferred), which applies a bag limit to the recreational sector and establishes an AM for the recreational sector is not expected to have a short-term economic effect on the commercial sector. There would be long-term positive economic effects for the commercial fishery due to implementation of an AM for the recreational fishery, assuming the recreational catch can be accurately monitored.

Alternative 3, which establishes a single ACL for the commercial and recreational sectors of 87,254 pounds gutted weight and an AM that closes the fishery when the ACL is projected to be met, could have a positive or negative short-term economic effect on the commercial fishery. If the shared ACL results in the commercial sector harvesting more than the 82,900 pounds allowed under **Alternatives 1 (Status Quo)** and **2 (Preferred)**, the commercial sector would benefit in the short-term up to $13,541 in ex-vessel revenues (4,354 pounds). If the commercial sector harvests less than 82,900 pounds allowed under **Alternatives 1 (Status Quo)** and **2 (Preferred)**, then the commercial sector will experience negative short-term economic effects, the amount of which depends on how much less is harvested. Either scenario could result in a shorter season than that experienced under **Alternatives 1 (Status Quo)** and **2 (Preferred)**.

Alternative 4 establishes a recreational AM of one snowy grouper per vessel when the commercial ACL is met. This could result in negative long-term economic effects for the commercial sector if the OFL is exceeded or if the recreational catch cannot be accurately monitored.

For the period 2003-2007, commercial landings averaged about 230 thousand pounds (Table 3-34), but due partly to more restrictive regulations over time commercial landings fell to about 123 thousand pounds in 2007.

Recreational Sector

Alternative 1 (Status Quo), which provides for no accountability measures, would be expected to have no short-run economic effects on the recreational sector, but long-term benefits would be reduced.

As provided in Snapper Grouper Amendment 15B, the recreational ACL would be set at 523 fish (4,400 gw) for the recreational snowy grouper fishery. This ACL is very low even when compared to the recreational landings of snowy grouper after the bag limit reduction in 2006. If effectively constrained to its ACL, the recreational sector may appear to incur relatively large short-run economic losses. **Alternative 2 (Preferred)**, with its bag limit of 1 fish per vessel per day, offers a high likelihood of constraining the recreational sector to its ACL. In a sense, **Alternative 2 (Preferred)** would render the recreational snowy grouper fishery a bycatch fishery, if it already were not. As with other measures, there arises the issue of effective monitoring and enforcement of the bag limit. Although the recreational ACL is low, target trips for snowy grouper are low in all fishing modes (see Table 3-46). The immediate implication here is that the economic effects of **Alternative 2 (Preferred)** may turn out to be relatively small. While charterboats accounted for most of recreational snowy grouper harvest (Table 3-44), the private mode registered a slightly higher target trip (Table 3-46), giving rise to the possibility that the private mode anglers would incur slightly more losses in consumer surplus than charterboat anglers.

Alternative 3 would close the recreational fishery once the single commercial and recreational ACL of 102,960 pounds whole weight is reached. For the period 2005-2008, commercial landings averaged annually at about 194 thousand pounds (Table 4-17d). Due partly to more restrictive regulations over time commercial landings trended significantly downward since 2006. In addition, Snapper Grouper Amendment 15B imposed a commercial ACL (quota) of 82,900 pounds gutted weight and a 100 pound trip limit, with the commercial sector being closed once the quota is projected to be met. It would appear, then, that factors, other than this present amendment, exist to reduce future commercial landings. Recreational landings of snowy grouper have fluctuated over time and averaged annually at about 8.4 thousand pounds for the years 2005-2008 (Table 4-17d). With the bag limit reduction to 1 fish per person per day in 2006, recreational landings plummeted in subsequent years. Again, factors exist, other than this amendment, which would reduce future recreational landings of snowy grouper. In addition, some alternatives under Action 1, including the current preferred alternative,

would act to reduce, partially or fully, recreational landings of snowy grouper. Therefore, given those other factors that would reduce commercial and recreational landings in the future, the adverse economic effects of **Alternative 3** on the recreational sector may be deemed relatively small.

Alternative 4 would implement the same bag limit as **Alternative 2**, but only when the commercial ACL of 82,900 pounds gutted weight is reached. The economic effects of both alternatives would be similar in nature but not in magnitude. **Alternative 4** would bring about lower reductions in economic benefits than **Alternative 2 (Preferred)**, because the recreational sector would operate at the more restrictive bag limit only part of the year. The recreational sector, by possibly exceeding its ACL and fishing part of the year with less competition from the commercial sector, would experience relatively lower economic losses under **Alternative 4**.

The economic effects of the various alternatives would partly depend on when the appropriate ACL is reached. Information in Table 4-17d provides some approximate timing of when the ACL would be reached. As earlier noted, both commercial and recreational landings experienced a substantial downward trend since 2006, so using average commercial and recreational data for 2005-2008 would tend to overestimate the true effects of the various ACL alternatives.

Under **Alternative 2 (Preferred)**, the recreational sector would remain open all year long, at least the first year of its implementation. However, the recreational ACL of about 5,192 pounds whole weight would be reached in July. Implementation of AMs would shorten the following year's season, with the closure possibly commencing in August. The single commercial/recreational ACL of **Alternative 3** of about 103 thousand would be reached in May, with recreational (and commercial) fishery closure starting in June. Given the commercial ACL of about 97,824 pounds whole weight under **Alternative 4**, the recreational AM of 1 fish per vessel per day would commence in May or June. The recreational sector, nonetheless, would remain open year round.

Table 4-17d. Average monthly commercial and recreational landings of snowy grouper, in thousand pounds whole weight, 2005-2008.

	Comm.	Rec.	Total	Comm. Cumulative	Rec. Cumulative	Total Cumulative
January	11.4	0.0	11.4	11.4	0.0	11.4
February	14.2	0.1	14.3	25.6	0.1	25.7
March	19.8	0.2	19.9	45.4	0.3	45.7
April	30.0	0.2	30.1	75.3	0.5	75.8
May	30.2	1.8	32.0	105.5	2.3	107.8
June	26.4	1.8	28.3	132.0	4.1	136.1
July	21.3	1.0	22.3	153.2	5.2	158.4
August	13.8	1.0	14.8	167.1	6.2	173.2
September	10.1	0.9	10.9	177.1	7.0	184.2
October	6.1	0.8	6.9	183.2	7.9	191.1
November	6.2	0.3	6.5	189.5	8.1	197.6
December	4.5	0.2	4.7	194.0	8.4	202.3
Total	194.0	8.4	202.3			

Given certain assumptions on the number of target trips that may be affected by the various alternatives, recreational losses in terms of consumer surplus and net operating revenues may be roughly approximated. The estimated short-term economic losses are presented in Table 4-17e. These estimates should be seen in the light of earlier discussions regarding reductions in recreational harvests due to other amendments that are not fully reflected in the 2005-2008 average harvests.

The ACL under **Alternative 2 (Preferred)** is about 62% of 2005-2008 recreational landings. Assuming similar proportions between landings and target trips, **Alternative 2 (Preferred)** would adversely affect 38% of recreational target trips. This would affect 39 charterboat target trips, 30 headboat target trips, and 3 private target trips. Headboat target trips were derived by taking the proportion of monthly snowy grouper landings to monthly snapper-grouper landings of headboats, and then applying the resulting ratio to the monthly headboat angler trips.

Alternative 3 is assumed to adversely affect recreational target trips for July through December, considering that the ACL would be reached in June. With this assumption, the number of target trips adversely affected would be 61for charterboats, 9 for private/rental, and 35 for headboats.

Alternative 4 is assumed to adversely affect 38% of target trips in September through December, considering that the recreational AM of 1 fish per vessel per day would take effect in September. In addition, it is assumed that the same ratio as used for **Alternative 2 (Preferred)** would apply to the trips when the recreational sector is subject to the 1 fish per vessel per day bag limit. This alternative would adversely affect 39 charterboat trips, 3 private/rental trips, and 39 headboat trips.

Table 4-17e. Reductions in consumer surplus and net operating revenues from various alternatives.

	Charterboats	Headboats	Private/Rental	Total
	Alternative 2			
Cons. Surplus	$143,962	$4,800	$49,920	$198,682
Net Oper. Rev.	$4,992	$2,040		$7,032
Total	$148,954	$6,840	$49,920	$205,714
	Alternative 3			
Cons. Surplus	$224,480	$5,600	$48,240	$278,320
Net Oper. Rev.	$7,808	$2,380		$10,188
Total	$232,288	$7,980	$48,240	$288,508
	Alternative 4			
Cons. Surplus	$143,667	$2,458	$46,310	$192,435
Net Oper. Rev.	$4,997	$1,044		$6,042
Total	$148,664	$3,502	$46,310	$198,477

Some of the factors that may produce results different from ones described above include the level of compliance, effectiveness in monitoring and enforcing the various ACLs/AMs, and adaptive change in behavior of the affected individuals. **Alternative 2 (Preferred)** would impose a very restrictive bag limit that could limit the recreational sector to its ACL if compliance were high or enforcement effective. If not, the ACL would be exceeded and, given an adequate monitoring effort, the recreational season would be shortened the following year. A shortened season, however, can prompt certain behavioral changes that could render monitoring inadequate, such as misreporting landings of snowy grouper.

Given the difficulty of obtaining recreational landings records on a real time basis, commercial landings records would be relied more in determining whether the ACL under **Alternative 3** has been reached. In this case, **Alternative 3** would allow both the commercial and recreational sectors to exceed their respective ACLs. If closures do occur, as shown above, the commercial sector may shift more effort to the early part of the year, resulting in dwindling fishing seasons over the years. While the commercial sector would still exceed its ACL, the recreational sector may eventually be landing fish lower than its ACL. More economic losses to the recreational sector can be expected from such a situation.

Under **Alternative 4**, the recreational sector would incur more economic losses if the commercial sector starts shifting more effort towards the start of the year. The recreational sector, nonetheless, would likely remain open all year long so that even if losses increase over time, the sector would be best off under this alternative.

4.3.3 Social Effects

A discussion of the general effects of ACLs and AMs in provided in **Section 4.0** and is incorporated herein by reference.

Alternative 1 (Status Quo) would retain the existing regulations for snowy grouper and allow the commercial sector to continue to harvest the current quota (82,900 pounds gutted weight) and allow the recreational sector to harvest 523 fish. The commercial quota and the recreational allocation would effectively constitute the ACL for each sector. The commercial fishery would be closed when the quota/ACL was met, but no AM for the recreational sector would be specified. As a result, similar to the discussion on golden tilefish, because of the sector-level approach for ACLs in the snowy grouper fishery and the absence of a recreational AM, **Alternative 1 (Status Quo)** would not fully satisfy the requirements of the Reauthorized Magnuson-Stevens Act and is not a viable long-term option. Additional subsequent management action, with duplicative administrative costs, would be required to address this deficiency. The absence of an AM in the recreational sector may benefit the sector in the short-term, but two issues arise. The first issue is that the absence of an AM for the recreational sector could lead to over-harvest of snowy grouper and precipitate stricter harvest measures in the long-term for both the commercial and recreational sectors, with associated adverse social and economic effects. The second issue deals with equity. Although the recreational snowy grouper fishery has historically been a relatively minor fishery, the absence of an AM in a fishery without substantive effort controls could be viewed as irresponsible management. Even with a restrictive daily of one fish per person, the potential for unchecked effort resulting in harvests that substantially exceed historic harvest levels may be significant. While subsequent action could be taken to enact any necessary protection, should the need arise, such would be redundant to the current management action and opportunity, incurring a duplication of time and resources to accomplish what could be accomplished under the current amendment.

In addition to continuing the status quo total harvest limits for both sectors and the commercial closure provisions when the commercial quota is met, **Alternative 2 (Preferred)** would reduce the recreational daily bag limit from one fish per person to one fish per vessel and implement an AM for the recreational sector. The reduction in the bag limit would not be expected to reduce the social benefits associated with the fishery because the total allowable harvest for the recreational sector would remain unchanged. It is assumed that the recreational sector would still be able to harvest its allocation under the reduced limit. All that would be affected would be who harvested the fish (two fish would have to be harvested on separate vessels rather than the same vessel) or when they were harvested (the same angler would have to harvest two fish on separate trips). The more restrictive limit could result in increased mortality if multiple snowy grouper are caught on the same trip and dead fish are required to be thrown overboard. Alternatively, fishermen may be motivated to change their fishing location upon the harvest of the first snowy grouper in order to avoid catching a second. Any increased mortality or forced fishing behavioral change may be viewed by some as wasteful or an unnecessary

infringement on fishing practices. However, as an extremely minor recreational target species (fewer than 700 recorded trips per year), such sentiments should be rare. The implementation of an AM for the recreational sector would be expected to eliminate concerns of harvest overage and associated threats to the resource, as well as reduce the equity concerns that may arise if each sector is not held accountable for its actions, as might occur under **Alternative 1 (Status Quo)**. The recreational AM may result in lower social and economic benefits to the recreational sector in subsequent years should harvest overages occur despite the reduced limit, but, assuming the overages do not degrade the health of the resource, the overages would, in effect, be a trade of increased current benefits for reduced future benefits. The net outcome is unknown, but given the small size of the snowy grouper recreational fishery, it is assumed the corrective action would not result in additional cumulative or compounded negative effects that exceed the short-term benefits of the overage (i.e., no business would be expected to close due to a closure of the recreational snowy grouper fishery in order to prevent re-occurrence of an overage).

Alternative 3 would establish a single ACL for snowy grouper that covers harvest in both the commercial and recreational sectors. This ACL would be equal to that of **Alternative 1 (Status Quo)**, **Alternative 2 (Preferred)**, and **Alternative 4**. However, as a single, whole-fishery ACL, under which the entire fishery would close when the ACL is projected to be met, either sector could increase harvests, relative to historic harvest levels, at the expense of the other. While the sector, and associated businesses and communities, with increased harvests would benefit, the other sector would not. Given the differences in harvest monitoring potential, an accelerated in-season closure may more likely be due to increased commercial harvests, such that the recreational sector also closes, with associated negative effects, even though actual recreational harvest information is not available and/or may be negligible. While the recreational fishery may get closed earlier than it otherwise would if managed separately, it is unlikely that this would result in any biological benefit to the resource. The theory of biological benefit would be, because harvest monitoring of the recreational sector is uncertain and not real time, early closure of the recreational sector may result in lower overall harvest in the given year. Also, it could be argued that early recreational closure may be successful in preventing harvest overages that are not identified until the subsequent year, thereby reducing the adverse effects of corrective action the subsequent year (corrective action need not be payback; because a closure date would include expectations of projected harvests as well as actual, accelerated harvests in the previous year or years would be incorporated in current year projections, effectively constituting a corrective action). The reality of either event is speculative at best. Further, actual total harvest will still be determined when final data are available, such that long-term biological neutrality will be preserved (allowable harvests will be increased or decreased according to stock growth or harvest overages). In the long term, this alternative would simply allow a functional reallocation of social and economic benefits according to the intentional or circumstantial harvest aggressiveness of the competing sectors.

The effects of **Alternative 4** would be expected to mirror those of **Alternative 3** except for one key difference. While **Alternative 3** would close the entire fishery when the

ACL was projected to be met, **Alternative 4** would allow the recreational fishery to remain open under a one-fish per vessel daily bag limit. While this would allow the recreational sector to avoid the in-season loss of benefits associated with an earlier than expected closure due to accelerated commercial harvests, such would result in continued harvest in excess of the ACL, with potential adverse stock effects that would eventually have to be repaid through reduced total harvest levels. As a result, while the recreational sector would benefit in the short-term, corrective action to address biological issues could result in decreased long-term social and economic benefits to the entire fishery.

In summary, **Alternative 1 (Status Quo)** would allow the same total harvest as **Alternative 2 (Preferred)** and **Alternative 3**, but would be expected to invoke equity issues as the recreational sector would not be subjected to the same harvest control or accountability measures as the commercial sector. **Alternative 2 (Preferred)** would establish limits and sector-specific accountability measures and eliminate the equity issues of **Alternative 1 (Status Quo)**. Although **Alternative 3** would allow the same total harvest as **Alternative 2 (Preferred)** (and **Alternative 1 (Status Quo)**), it would be expected to result in lower social benefits because it would allow one sector to gain at the expense of the other and would require no individual sector accountability. **Alternative 4** would be expected to result in greater social benefits than **Alternative 3** in the short-term, but may result in greater adverse long-term effects if harvest overages degrade the resource.

4.3.4 Administrative Effects

Specifying the current quota based on the TAC of 102,960 lbs ww (87,254 lbs gw) as the snowy grouper ACL under **Alternative 1 (Status Quo)** would be the least burdensome of all the alternatives since the quota has already been implemented and quota monitoring already currently exists. However, no AM would be established for the recreational sector under **Alternative 1 (Status Quo),** which does not meet the purpose and need of this amendment which is to comply with ACL provisions of the Magnuson-Stevens Act. **Alternative 2 (Preferred)** would be the most administratively burdensome of all the alternatives analyzed since it would not only require monitoring of a very small recreational allocation, it would also require the publication of notices informing anglers of each year's overages and what actions would be taken in the following year to compensate for those overages. **Alternatives 3** and **4** would likely incur similar minimal administrative effects relative to each other and **Alternative 1 (Status Quo)**. Those effects would take the form of development and dissemination of outreach materials, and coordination among various NOAA Fisheries Service line offices.

4.3.5 Council Conclusions

The Snapper Grouper Advisory Panel did not have any recommendations.

The Law Enforcement Advisory Panel did not have any recommendations.

The Scientific and Statistical Committee (SSC) noted that the analysis of recreational catch options is deficient with respect to anticipated effects of the proposed one snowy grouper per vessel per day compared to the current allowance of one fish per person per day. As with golden tilefish, the SSC wondered about the efficacy of monitoring a small recreational quota (523 fish) with MRFSS and the problems that may ensue with what may turn out to be annual triggering of the AM.

The Council selected **Alternative 2** as their preferred snowy grouper ACL alternative. **Alternative 2 (Preferred)** would establish a recreational daily bag limit of 1 snowy grouper *per vessel*, and it would implement AMs for the recreational sector for snowy grouper. The commercial ACL would be the same as the current quota which is 82,900 lbs gw. The recreational ACL would be the same as the current recreational allocation which is 523 fish. If the recreational ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the recreational ACL for the following fishing year. The recreational ACL would be compared with recreational landings over a range of years. For 2010, 2010 landings would be used. For 2011, the average landings for 2010 and 2011 would be used. For 2012 and beyond, the most recent three-year running average would be used. **Alternative 2 (Preferred)** would establish limits and sector-specific accountability measures and eliminate the equity issues under the status quo. **Alternative 2 (Preferred)** was chosen in part because it includes a mechanism of tracking the recreational ACL that may overcome the challenges of monitoring such a low level of recreational landings of snowy grouper. Using landings from a range of years to compare to the recreational ACL may help to account for the great variability in snowy grouper landings from year to year, and thus trigger AMs when they are most appropriate. Reducing the bag limit of snowy grouper from one per person to one per vessel per day is likely to remove the incentive to target the species, help rebuild the stock, and keep recreational harvest at or below the proposed recreational ACL. In a sense, **Alternative 2 (Preferred)** would render the recreational snowy grouper fishery a bycatch fishery.

The Council recognizes the difficulty in tracking such a small recreational ACL and considered requiring a tag system but deferred detailed consideration of such a tag system to the future. Data are not available to quantitatively analyze the reduction in recreational harvest from reducing the bag limit from 1 per person per day to 1 per vessel per day. However, this reduced bag limit, combined with the prohibition on fishing for deepwater species deeper than 240 feet, should significantly reduce the recreational catch. If the reduction in recreational catch is not sufficient to prevent the recreational ACL from being exceeded, the Council's preferred alternative includes an AM that would require the Regional Administrator to reduce the length of the following fishing year by the

amount necessary to ensure landings do not exceed the recreational ACL. The Council concluded the preferred alternative is sufficient to prevent the recreational ACL from being exceeded on a continuing basis. The Council will monitor the catches and if the regulations need changing, the framework procedure will be used.

The Council concluded the preferred alternative is sufficient to prevent overfishing of snowy grouper, that this action meets the new requirements of the reauthorized Magnuson-Stevens Act, and meets the SSC recommendations for ABC. The Council also concluded the preferred alternative best meets the goals and objectives of the Snapper Grouper FMP as amended.

4.4 Black grouper, black sea bass, gag, red grouper, and vermilion snapper

Alternative 1 (Status Quo). Retain existing regulations for black grouper, black sea bass, gag, red grouper, and vermilion snapper.

ACLs

The commercial and recreational ACLs are specified in Table 4-18. The ACLs for black sea bass are based on a constant catch rebuilding strategy. The gag and vermilion snapper ACLs are based on the yields at F_{OY} and would remain in effect beyond 2009 until modified. The ACLs for black grouper and red grouper have not been specified.

Table 4-18. Current commercial and recreational ACLs in pounds gutted weight (gw) for black sea bass, gag, and vermilion snapper.

Species	Commercial ACL	Recreational ACL
Black sea bass	309,000 lbs gw	409,000 lbs gw
Gag[1]	352,940[1]	340,060[1]
Black grouper	None	None
Red grouper	None	None
Vermilion snapper [2]	315,523 lbs gw (January – June) and 302,523 lbs gw (July – December) [2]	307,315 lbs gw[2]

[1]Amendment 16 implemented a gag commercial quota of 352,940 lbs gutted weight and a recreational allocation of 340,060 lbs gutted weight. These values are being used to set ACLs in Snapper Grouper Amendment 17B.

[2]Amendment 16 resulted in a vermilion snapper commercial quota of 315,523 lbs gutted weight (January – June) and 302,523 lbs gutted weight (July – December) and a recreational allocation of 307,315 lbs gutted weight. These values are being used to set ACLs in Snapper Grouper Amendment 17B.

Current commercial regulations are shown in Table 4-19 and recreational regulations are shown in Table 4-120.

Table 4-19. Current commercial regulations for shallow water and mid-shelf species. Pounds (lbs) are in whole weight (ww) and gutted weight (gw).

COMMERCIAL REGULATIONS						
Species	Size Limit	Limited Access	Gear Restrictions	Annual Quota	Seasonal Closures	Area Closures
Black Grouper	24" TL	√	√		Jan-Apr[2]	√
Black Sea Bass	10" TL	√	√	309,000 lbs[1]		√
Gag	24" TL	√	√	416,469 lbs ww 352,940 lbs gw[2]	Jan-Apr[2]	√
Red Grouper	20" TL	√	√		Jan-Apr[2]	√
Vermilion Snapper	12" TL	√	√	315,523 lbs gw (Jan-June) 302,523 lbs gw (July-Dec)[2]		√
Red Snapper	20" TL	√	√			√
[1]Based on TAC of 718,000 lbs gutted weight (847,000 lbs whole weight). [2]Implemented in July 2009 through Snapper Grouper Amendment 16.						

Table 4-20. Current recreational regulations for shallow water and mid-shelf species.

RECREATIONAL REGULATIONS						
Species	Allowable Catch	Size Limit	Gear Restrictions	Possession Limit	Seasonal Closures	Area Closures
Black Grouper		24" TL	√	No more than 1 black grouper and/or gag individually or in combination (included in 3 grouper per person per day)[1,2]	Jan-Apr[1]	√
Black Sea Bass	409,000 lbs gw[3]	12" TL	√	Daily bag limit = 15		√
Gag		24" TL	√	No more than 1 black grouper and/or gag individually or in combination (included in 3 grouper per person)[1,2]	Jan-Apr[1]	√
Red Grouper		20" TL	√	Included in 3 grouper per person per day[1,2]	Jan-Apr[1]	√
Vermilion Snapper		12" TL	√	5 (in addition to the aggregate snapper bag limit of 5)[1,2]	Nov-Mar[1]	√
Red Snapper		20" TL	√	2 per person per day (included in the 10 aggregate snapper per person limit)[1,2]		√
[1]Implemented in July 2009 through Snapper Grouper Amendment 16. [2]Exclude the captain and crew on for-hire vessels from possessing a bag limit for groupers. [3]Based on TAC of 718,000 lbs gutted weight (847,000 lbs whole weight).						

AMs
The commercial AM for black sea bass, gag, and vermilion snapper is to prohibit harvest, possession, and retention when the quota for each species is projected to be met. The commercial AM for black grouper and red grouper is to prohibit harvest, possession, and retention when the quota for gag is projected to be met. All purchase and sale is prohibited when a quota is projected to be met. There are no recreational AMs for black grouper, black sea bass, gag, red grouper, and vermilion snapper.

ACTs
ACTs are not specified in the commercial or recreational sectors for black grouper, black sea bass, gag, red grouper, and vermilion snapper.

ACL Alternatives

Alternative 2. Establish commercial and recreational ACLs.

Alternative 2a. The commercial and recreational ACLs for black grouper are 86,886 lbs gutted weight and 31,863 lbs gutted weight, respectively. The commercial and recreational ACLs for red grouper are 221,577 lbs gutted weight and 276,740 lbs gutted weight, respectively. These values are equivalent to the expected catch resulting from the implementation of management measures for red grouper and black grouper in Snapper Grouper Amendment 16.

Alternative 2b (Preferred). Retain the commercial ACL for gag of 352,940 lbs gutted weight and the commercial AM to prohibit commercial harvest of shallow water groupers when the quota is projected to be met. Retain the recreational ACL for gag of 340,060 lbs gutted weight.

In addition, establish an ACL for gag, black grouper, and red grouper of 662,403 lbs gutted weight (commercial) and 648,663 lbs gutted weight (recreational). [These values are equivalent to the expected catch resulting from the implementation of management measures for red grouper and black grouper in Amendment 16 and the gag quota specified in Amendment 16.]

Prohibit the commercial possession of shallow water groupers when the gag or the gag, black grouper, and red grouper ACL is projected to be met.

ACT Alternatives
Alternative 3. Establish an ACT for the recreational sector.

Alternative 3a. The recreational sector ACT equals 85% of the recreational sector ACL.

Alternative 3b. The recreational sector ACT equals 75% of the recreational sector ACL.

Alternative 3c. The recreational sector ACT equals sector ACL[(1-PSE) or 0.5, whichever is greater].

AM Alternatives

Alternative 4 (Preferred). For black grouper, black sea bass, gag, red grouper, and vermilion snapper, compare the recreational ACL with 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 5. Implement Accountability Measures (AMs) for the recreational sector for black grouper, black sea bass, gag, red grouper, and vermilion snapper.

Alternative 5a. Regardless of stock status, do not implement in-season AMs (a fishery closure) if the sector ACL is projected to be met. If the ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing season by the amount necessary to ensure landings do not exceed the sector ACL for the following fishing season.

Alternative 5b (Preferred). If at least one of the species *is overfished* and the sector ACL is projected to be met, prohibit the harvest and retention of the species or species group. If the ACL is exceeded, independent of stock status, the Regional Administrator shall publish a notice to reduce the sector ACL in the following season by the amount of the overage.

Alternative 5c. If a species *is overfished* and the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the ACT is exceeded, the Regional Administrator shall publish a notice to reduce the sector ACT in the following season by the amount of the overage.

*Note: It is the Council's intent that all recreational closures in the South Atlantic are associated with a possession limit of zero on board a vessel for which a valid federal South Atlantic Charter/Headboat Permit for Snapper-Grouper has been issued, regardless of where such species were harvested, i.e., in state or federal waters.
**Note: The overfished status is based on the most recent quarterly update of the status of the stocks report.

4.4.1 Biological Effects

ACLs
Alternative 1 (Status Quo), would retain the current regulations established for black sea bass through Snapper Grouper Amendments 13C and 15A and for gag, red grouper, black grouper, and vermilion snapper through Snapper Grouper Amendment 16. Measures for these species are intended to end overfishing of black sea bass, gag, and

vermilion snapper and limit catch levels to the yield at F_{OY}. Management measures in Snapper Grouper Amendment 16 also address overfishing of black grouper and red grouper as they are expected to provide reductions in harvest equivalent to 37% and 20%, respectively.

Table 4-21. Current ACL values compared with the SSC's ABC recommendations.

	ABC Recommendation (P*=.30/gag & .275/vermilion)	**Proposed ACLs (75%F_{MSY})**
Gag	805,000 lb gw (landed catch) 885,000 lb gw (total kill)	818,920 lbs ww 693,000 lbs gw
Vermilion Snapper	1,078,000 lb ww (landed catch) 1,109,000 lb ww (total kill)	1,066,000 lbs ww 925,361 lbs gw

As noted in Table 4-21, proposed ACL values for gag and vermilion snapper are both lower than the ABC recommended by the SSC. Setting the ACL lower than the recommended ABC is recommended in the final National Standard 1 (NS1) guidelines (74 FR 3178). National Standard 1 guidelines also state that Councils may establish a process for establishing an ABC control rule, which the Council is doing. This ABC control rule, and resulting ABC recommendations, will be included in the Comprehensive ACL Amendment for the South Atlantic Region which is currently in the development stage.

For black sea bass, regulations established in October 2006 include a: 309,000 pound commercial quota; 10" total length commercial minimum size limit; 409,000 pound recreational allocation; 12" total length recreational minimum size limit; and a 15 fish bag limit. The quota and recreational allocation was based on applying an allocation established to a TAC corresponding to the yield at 75% F_{MSY}. As Snapper Grouper Amendment 15A established a rebuilding strategy for black sea bass that would hold catch steady throughout the rebuilding time frame, the allowable catch would be less than the yield at 75%F_{MSY} after 2009.

Snapper Grouper Amendment 16 has been approved by the Secretary and the final rule became effective on July 29, 2009. For gag, Snapper Grouper Amendment 16 established a quota of 348,000 pounds gutted weight, a January-April spawning season closure for the recreational and commercial sectors, and a reduction in the bag limit to 1 gag or black grouper (combined) within a 3 grouper aggregate bag limit. The spawning season closure also applies to black grouper and red grouper and the aggregate bag limit for groupers was reduced from 5 to 3 fish per person per day. Furthermore, the commercial harvest and sale of black grouper and red grouper would be prohibited when the gag quota is projected to be met. While red grouper and black grouper are undergoing overfishing (NMFS 2008) it is unknown if the proposed actions in Snapper Grouper Amendment 16 would end overfishing since the stocks have not been recently assessed. However, it is likely the actions would reduce the amount of overfishing since harvest reductions in the commercial and recreational sector associated with the four month seasonal closure and commercial quota for gag would approximate 37% and 20% for black grouper and red grouper, respectively. Based on Amendment 16, the ACL for

vermilion snapper under the status quo, **Alternative 1 (Status Quo)** would be 315,523 lbs gw January-June, and 302,523 lbs gw July-December for the commercial sector, and 307,315 lbs gw for the recreational sector.

The final NS1 guidelines recognize that existing FMPs may use terms and values that are similar to, associated with, or may be equivalent to OFL, ABC, ACL, ACT, and AM in many fisheries for which annual specifications are set for different stocks or stock complexes. In these situations the guidelines suggest that, as Councils revise their FMPs, they use the same terms as set forth in the NS1 guidelines.

The ACL serves as a catch limit for a species which triggers some sort of AM to ensure overfishing of a species does not occur. The ACLs for the commercial and recreational sectors for black sea bass, gag, and vermilion snapper are based on the yield at 75%F_{MSY} as specified in Snapper Grouper Amendments 13C (black sea bass) and 16 (gag and vermilion snapper; Table 4-18). Amendment 16 also reduces harvest levels of red grouper and black grouper with the proposed commercial and recreational management measures. The expected commercial and recreational catches based on management measure implemented through Amendment 16 are specified in Table 4-22.

Snapper Grouper Amendments 13C and 16 specified measures to reduce the chances that overfishing occurs by closing all commercial fishing for gag, vermilion snapper, and black sea bass when the quota (commercial ACL) is projected to be met, which is the commercial AM. A commercial AM also exists for red grouper and black grouper since Amendment 16 specifies no commercial fishing would take place for these species and other shallow water grouper species when the commercial quota for gag is projected to be met. An AM for the recreational sector was not specified in Amendments 13C or 16. Therefore, the no-action **Alternative 1 (Status Quo)**, which was determined to be based upon the best available science by the Scientific and Statistical Committee (SSC), would end overfishing of black sea bass, gag, and vermilion snapper, rebuild the black sea bass stock, and satisfy the requirements of the Reauthorized Magnuson-Stevens Act. As a result, retention of status quo management measures would not likely have negative biological impacts on the stocks if management measures established through Snapper Grouper Amendments 13C, 15A, and 16 end overfishing.

Table 4-22. The current commercial and recreational ACLs for gag, and potential ACLs for black grouper, red grouper and, gag combined based on expected catch resulting from Amendment 16 management measures.

Species	Commercial ACL	Recreational ACL
Gag	352,940 lbs gw	340,060 lbs gw
Black grouper	86,886 lbs gw	31,863 lbs gw
Red grouper	221,577 lbs gw	276,740 lbs gw
Combined	662,403 lbs gw	648,663 lbs gw

Under **Alternative 2**, the ACLs for black grouper and red grouper would be equivalent to the expected catch resulting from management measures in Amendment 16 (Table 4-22).

If necessary, this could be adjusted by framework after the assessments for these species have been completed in 2010. Snapper Grouper Amendment 16 would reduce the catch of black grouper and red grouper through a January-April commercial and recreational spawning season closure, a reduction in the recreational bag limit, and a closure of the commercial fishery for black grouper and red grouper when the gag quota is projected to be met. **Alternative 2a** would establish separate ACLs for red grouper and black grouper. **Alternative 2b (Preferred)** would establish combined commercial and recreational ACLs for gag, red grouper, and black grouper based on expected catch resulting from management measures in Amendment 16. The combined commercial ACL for all three species would be 662,403 lbs gw, and the combined recreational ACL would be 648,663 lbs gw. It is important to note that SEDAR assessments for red grouper and black grouper will be completed in 2010, after which, the ACLs for red and black grouper may be modified through a framework adjustment if **Alternative 2 (Preferred)** under the "Modification of Framework Procedures" action of this amendment is implemented through rulemaking. The same ACL modifications would also be possible for any other snapper grouper stock to which an ACL is assigned.

ACTs

Alternative 3a is the least conservative of the action alternatives and would set the recreational sector ACT for gag, black grouper, red grouper, black sea bass, and vermilion snapper equal to 85% the ACL. A greater biological benefit would be attained through **Alternative 3b**, which would set the ACT to 75% of ACL. There is greater uncertainty with recreational catch data than commercial data. Quota monitoring systems can accurately track commercial landings data, but this is not possible for the recreational sector with the existing data collection system. Recreational data are based on samples, which are expanded to account for effort. Therefore, there can be tremendous uncertainty for recreational data, particularly for those species which are infrequently encountered (Table 4-23a). Recreational data for frequently encountered species such as black sea bass and vermilion snapper are more reliable than for less frequently taken species such as black grouper. **Alternative 3c** attempts to capture the difference in uncertainty associated with black sea bass, gag, black grouper, red grouper, and vermilion snapper by incorporating the percent standard error (PSE) in the estimate of ACT. Therefore, the ACT for species such as vermilion snapper and black sea bass would be higher than the ACT for species such as black grouper with higher estimates of PSE, which are less frequently encountered.

Since the ACT is typically set lower and would be reached sooner than the ACL for any given species, using an ACT rather than the ACL as a trigger for AMs in the recreational sector may prevent an ACL overage before it occurs. This more conservative approach, along with using the most recent three year running average of landings (see **Alternative 4 (Preferred)**), would likely help to ensure that recreational data uncertainties do not cause or contribute to excessive ACL overages for vulnerable species. Using recreational ACTs rather than the ACLs to trigger recreational AMs may not eliminate ACL overages completely; however, using such a strategy for the recreational sector may reduce the need to make up for very large overages, which could benefit the biological and socioeconomic environments. Additionally, triggering AMs before the recreational ACL

is exceeded in any given year may also help to reduce the recreational sector's contribution to overfishing for shallow water snapper grouper species.

Gag, vermilion snapper, black grouper, red grouper, and black sea bass are currently managed at the OY level as implemented through past amendments and recommended by the Council's SSC. Therefore, the use of ACT as a trigger for AMs could be overly conservative assuming that ACTs for these species would be set below the ACL. In order to use the ACT as an AM trigger without implementing more restrictive harvest levels beyond what they are currently, the ACT would need to be set equal to the ACL.

Table 4-23a. Proportional Standard Errors (PSEs) for the five species from numbers estimates including the ACT values if Alternative 3C was implemented.

Species	2004	2005	2006	2007	2008	3 year average (2006-2008)	5 year average (2004-2008)	Current or proposed rec. ACL (lbs gw)	Rec. ACT under Alt. 3C (lbs gw) [1]
Black grouper	38.5	48	57.9	44.1	47.1	49.7	47.1	31,863[2]	16,516
Black sea bass	11.3	9.4	11.2	10.8	13.0	11.7	11.1	409,000	364,010
Gag	17.0	19.1	16.7	16.2	17.3	16.7	17.3	340,060	281,230
Red grouper	24.6	20.7	21.1	27.3	24.0	24.1	23.5	276,740[2]	211,706
Vermilion snapper	14.3	10.6	14.2	10.6	11.2	12.0	10.4	307,315	275,354

[1]The 5 year average of PSEs is used to calculate the ACT.
[2]ACLs of 31,163 and 276,740 lbs gw are proposed in Alternative 2a.

Source: PSE's Provided by MRFSS staff on 01.26.10.

If **Alternative 2** under the "Modification of Framework Procedures" action in this amendment is implemented through rulemaking, any ACT established for a snapper grouper stock could be modified, if needed, through a framework adjustment. If no ACT level is chosen as a preferred alternative under this action, and the ACLs under **Alternative 2b (Preferred)** were exceeded repeatedly, the Council would also have the option of establishing an ACT for any snapper grouper species at or below the ACL or adjust the ACL to a more conservative level, through framework actions.

AMs

Alternative 4 (Preferred) would use a range of landings to determine overages of recreational ACLs in **Alternative 2**. In the first year (2010), only 2010 landings would be used. In the second year (2011), the average landings of 2010 and 2011 would be compared to the ACL to determine if an overage had occurred. For 2012 and beyond, the most recent three year running average would be employed to determine if there was an overage of the ACL. Recreational landings data can be highly variable, particularly for species that are infrequently encountered. Therefore, using average landings for comparison with the ACL can buffer peaks in the landings that may be a function of sampling rather than a true estimation of actual harvest. However, for some species very rarely encountered in recreational surveys (i.e., golden tilefish and snowy grouper), estimates of recreational harvest may be less reliable.

Alternative 4 (Preferred) would implement AMs for the recreational sectors for black sea bass, gag, black grouper, red grouper, and vermilion snapper stocks. AMs are designed to provoke an action once either the ACL or ACT is reached during the course of a fishing season to reduce the risk overfishing will occur. However, depending on how timely the data are, it might not be realized that either the ACL and/or ACT has been reached until after a season has ended. This is especially true for the recreational sector where real-time monitoring of catch is not possible with the current data collection program.

Alternative 1 (Status Quo) would not implement AMs for the recreational sector for species undergoing overfishing. Snapper Grouper Amendments 13C and 16 specify quotas for the commercial sector for black sea bass, snowy grouper, golden tilefish, gag, and vermilion snapper. When a quota is projected to be met, commercial fisheries for these species would be closed. Further, the preferred alternative in Amendment 16 would close the commercial fisheries for red grouper and black grouper when the gag quota is projected to be met. Therefore, a type of AM currently exists or will be put into place for the commercial sector.

Alternative 5 would implement AMs for gag, black grouper, red grouper, vermilion snapper, and black sea bass in the recreational sector regardless of stock status; whereas, the type of AM under **Sub-Alternatives 5a** and **5b** would depend on stock status. Under **Sub-Alternative 5a**, if the ACL was exceeded, the Regional Administrator would reduce the length of the following fishing year by the amount necessary to ensure landings did not exceed the sector ACT for the following fishing year. Under **Sub-Alternative 5b (Preferred)**, if a species is overfished and the sector ACL is projected to be met, harvest and retention of species or species group would be prohibited. If the ACL is exceeded, the Regional Administrator shall publish a notice to reduce the sector ACL in the following year by the amount of the overage, regardless of stock status. **Sub-Alternative 5c** would only be invoked if one of the ACT Sub-Alternatives were chosen as a preferred. Under **Sub-Alternative 5c**, harvest and retention of black sea bass, gag, black grouper, red grouper, and/or vermilion snapper would be prohibited if the species or species group in question is overfished and is projected to exceed its ACT. If such an event were to occur, the Regional Administrator would reduce the sector ACT in the following year by the amount of the overage. Using the ACT rather than the ACL harvest level to trigger an AM reduces the chance the ACL will be exceeded and enhance the stock recovery process.

Closing the fishery when the AM is met, as well as reducing the length of the following fishing year enough to make up for the amount of the ACL overage for an overfished species, would likely have a greater biological benefit than only reducing the length of the fishing season as specified in **Alternative 5a.** The difference between the two levels of biological benefit is due to incidental catch of the regulated species that could occur during a closed season. AMs that shorten the fishing season can increase the magnitude of regulatory discards and may not be as effective as AMs that lower the target level but still allow some catch.

An overview of catch levels for black sea bass; gag; gag, black grouper, and red grouper; and vermilion snapper is shown in Table 4-23b. There are systems in place to track commercial landings, and the fishery is closed when the quota is projected to be met. There is a very low level of management uncertainty in the ability to track commercial landings and ensure the quotas are not exceeded. There is a higher level of management uncertainty in the ability to track the recreational landings and ensuring the recreational ACLs are not exceeded. Best estimates of the commercial and recreational catches are shown in Table 4-23c.

Table 4-23b. Overview of catch levels (pounds) for black sea bass, gag, black grouper, red grouper, and vermilion snapper.

Species	MSY[1]	OY[1]	ACL[2]	Com. ACL	Rec. ACL
Black sea bass	2,354,089 lbs gw	2,324,196 lbs gw	718,000 lbs gw	309,000 lbs gw	409,000 lbs gw
Gag	1,238,000 lbs gw	1,217,000 lbs gw	693,000 lbs gw	352,940 lbs gw	340,060 lbs gw
Gag, black grouper, & red grouper[3]	unknown	unknown	1,311,066 lbs gw[4]	662,403 lbs gw[4]	648,663 lbs gw[4]
Vermilion snapper	1,665,000 lbs ww	1,635,000 lbs ww	1,066,000 lbs ww	315,523 lbs gw (Jan-June) & 302,523 lbs gw (July-Dec)	307,315 lbs gw

Notes: MSY and OY for black sea bass were specified through Snapper Grouper Amendment 15A. MSY and OY for gag and vermilion snapper were specified through Snapper Grouper Amendment 16. Gutted weight = gw and Whole weight = ww.

[1]Represents value when the stock is at equilibrium.

[2]Equivalent to yield at F_{OY} based on current biomass levels.

[3]Results from recent SEDAR assessments for red grouper and black grouper will be reviewed by the Council's Scientific & Statistical Committee (SSC) in April 2010 and by the Council in June 2010. Any necessary changes will be addressed in a future amendment.

[4]Represents expected catch from regulations put in place through Amendment 16.

Table 4-23c. Best estimates of recent catch (pounds) for black sea bass, gag, black grouper, red grouper, and vermilion snapper.

Species	Commercial Catch	Average Recreational Catch (2003-2008)
Black sea bass[1]	298,159 lbs gw (96% of quota; com. fishery closed 12/20/09)	783,157 lbs
Gag[2]	292,172 lbs gw (83% of quota; before Jan-April closure)	622,558 lbs (before Jan-April closure)
Gag, black grouper, & red grouper[3]	793,172 lbs gw (before Jan-April closure)	1,170,547 lbs (before Jan-April closure)
Vermilion snapper[4]	Jan-June: 384,475 lbs gw (122% of quota; implemented 7/29/09) July-Dec: 359,871 lbs gw (119% of quota; com. fishery closed 9/18/09)	596,237 lbs (before Nov-March closure)

[1]Black sea bass fishing year = 6/1-5/31; Source: Commercial data from Memo Crabtree to Mahood 3/10/10; Recreational data from Table 3-41.

[2]Gag fishing year = 1/1-12/31; Source: Commercial data from Memo Crabtree to Mahood 3/2/10; Recreational data from Table 3-41.

[3]Gag, black grouper & red grouper fishing year = 1/1-12/31; Source: Commercial data for gag from Memo Crabtree to Mahood 3/2/10; Commercial data for black and red groupers from Tables 3-16 and 3-24 respectively; Recreational data from Table 3-41.

[4]Vermilion snapper commercial fishing year = 1/1-6/30 and 7/1-12/31; Source: Commercial data from Memo Crabtree to Mahood 3/2/10 and previous quota reports; Recreational data from Table 3-41.

Note: Gutted weight = gw and Whole weight = ww.

Comparison of Commercial Catches with the Commercial ACL

As can be seen in Table 4-23c, the commercial catches have been held below the commercial quota for black sea bass and gag. The vermilion snapper quota for January-June was exceeded in July-August 2009 because the new quota was put into place on July 29, 2009, and the quota monitoring system for that species had just been initiated. The July-December quota was exceeded, and the commercial fishery closed on September 18, 2009. Changes have been implemented to begin tracking the aggregate landings of gag, black grouper, and red grouper. The January through April spawning season closure that started in January 2010 (Snapper Grouper Amendment 16) will also help keep catches below the commercial ACL.

Comparison of Recreational Catches with the Recreational ACL

As can be seen in Table 4-23c, the recreational catches have been higher than the recreational ACLs. For black sea bass, Snapper Grouper Amendment 13C (effective 10/23/06) increased the minimum size limit from 10" to 11" in year 1 and to 12" in year 2 and reduced the recreational bag limit from 20 to 14 per person per day. These regulations were expected to reduce the recreational catch by 43.4% - 59.6% depending

on assumptions about the release mortality rate and the compliance rate. For gag, Snapper Grouper Amendment 16 (effective 7/29/09) implemented a January through April spawning season closure; reduced the 5-grouper aggregate bag limit to 3-grouper; reduced the 2 gag/black to 1 gag/black within the aggregate; and excluded captain and crew from possessing a bag limit. These regulations were expected to reduce the recreational catch by 36%. For gag, black grouper, and red grouper combined, the same regulations listed above for gag apply. These regulations were expected to reduce the recreational catch by 36%. For vermilion snapper, Snapper Grouper Amendment 16 (effective 7/29/09) reduced the bag limit from 10 to 5 per person per day and implemented a November 1 through March 31 closed season to reduce catches to end overfishing. These regulations were expected to reduce the recreational catch by 47%.

The impacts of these regulations for black sea bass; gag; gag, black grouper, and red grouper; and vermilion snapper are not fully reflected in Table 4-23c because only average 2003-2008 landings were available in Snapper Grouper Amendment 17B. More recent recreational catch data were not available for comparison during development of Amendment 17B.

Alternative 1 (Status Quo) would perpetuate the existing level of risk for interactions between ESA-listed species and the fishery. Establishing ACLs, ACTs, or AMs is unlikely to alter fishing behavior in a way that would cause new adverse effects to *Acropora*. The impacts from **Alternatives 2-5,** and the associated sub-alternatives**,** on sea turtles and smalltooth sawfish are unclear. If they perpetuate the existing amount of fishing effort, but cause effort redistribution, any potential effort shift is unlikely to change the level of interaction between sea turtles and smalltooth sawfish and the fishery as a whole. If these alternatives reduce the overall amount of fishing effort in the fishery, the risk of interaction between sea turtles and smalltooth sawfish will likely decrease.

4.4.2 Economic Effects

Commercial Fishery

Snapper Grouper Amendment 17B considers three methods of establishing commercial catch limits for red grouper and black grouper. **Alternative 1 (Status Quo)** is the no-action alternative in which no catch limits are specified for red and black grouper. However beginning in mid-2009, Amendment 16 indirectly limits the commercial catch of red grouper and black grouper. The commercial fishery for shallow water groupers, including red grouper and black grouper, is closed from January through April and when the commercial ACL for gag of 352,940 lbs (gutted weight) is projected to be met. **Alternative 2a** would specify annual catch limits (ACLs) for each species: 221,577 lbs (gutted weight) for red grouper and 86,886 lbs (gutted weight) for black grouper. **Alternative 2b (Preferred)** would specify both a commercial gag ACL of 352,940 lbs (gutted weight) and an aggregate commercial catch limit of 662,403 lbs (gutted weight) for gag, red grouper, and black grouper.

Commercial landings of red grouper in federal waters increased from approximately 87,700 pounds (gutted weight) worth $171,500 in 1993 to 316,000 pounds worth $742,200 in 1999 and then declined through 2005 (Figure 4-11).[7] The sharp increase in landings from 171,200 lbs worth $471,200 in 2005 to 491,300 lbs worth more than $1.61 million in 2008 could reflect an adjustment by fishermen to regulations on other species that were imposed in 2006 by Snapper Grouper Amendment 13C and/or a larger biomass of red grouper available for capture. Commercial landings of black grouper in federal waters averaged 52,400 pounds (gutted weight) worth $183,700 from 2005-2008. Commercial landings of gag in federal waters averaged 533,100 lbs (gutted weight) worth more than $2.1 million from 2005-2008, but, as already noted, Snapper Grouper Amendment 16 implemented a commercial quota of 352,940 lbs in 2009.

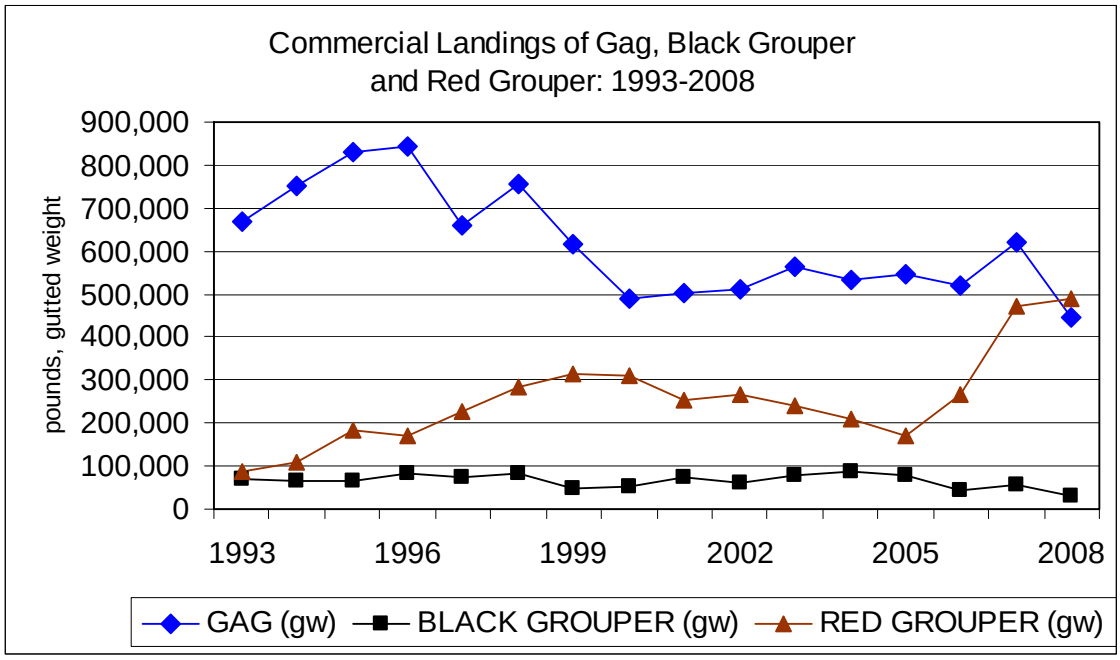


Figure 4-11. Commercial landings in federal waters: gag, red grouper, and black grouper, 1993-2008.
Source: SEFSC logbook database as of June 29, 2009.

Alternative 2a proposes a commercial catch limit that is less than one-half of the quantities of red grouper that were landed from federal waters in 2007 and 2008, as reported in the logbook database. Nevertheless, the simulation model predicts that commercial net operating revenues would decline by an average of approximately $162,000 per year or only 1.8% of the predicted base net operating revenues for Snapper Grouper Amendment 17B (Figures 4-12a and 4-12b). This seemingly unexpected result

[7] Revenues are presented as current year dollars and have not been adjusted for inflation over time. Trip revenues were approximated as reported landings multiplied by average prices from the NMFS Accumulated Landings System.

occurs because the simulation model calculates expected economic outcomes based on average results when proposed regulations are imposed on logbook data for 2005-2008. The problem is that regulatory conditions during 2005 and 2006, before Snapper Grouper Amendment 13C was implemented, are not as relevant for the red grouper fishery as are conditions during 2007 and 2008, and larger losses would have been predicted if the analysis had been based on data for 2007 and 2008 only. If fishing and regulatory conditions in the near future closely resemble conditions in 2007, then the simulation model predicts that net operating revenues would decline by about $244,000 or 2.7% compared to baseline conditions. If conditions in the near future were similar to conditions in 2008, then the model predicts that net operating revenues would decline by $404,000 or 4.1%. These effects would primarily affect fishermen in North Carolina and South Carolina (Figures 4-13a and 4-13b).[8] The commercial catch limit proposed for black grouper in **Alternative 2a** is expected to have no effect on net operating revenues of commercial fishermen because average landings of black grouper in federal waters were less than the proposed catch limit.

The aggregate catch limit for gag, red grouper, and black grouper in **Alternative 2b (Preferred)** is expected to reduce commercial net operating revenues by slightly more than $100,000 per year, or only 1.2% of the predicted base net operating revenues for Amendment 17B (Figures 4-12a and 4-12b). These results are expectations based on the four-year average with data from 2005-2008. If fishing and regulatory conditions in the near future closely resemble conditions in 2007, then the simulation model predicts that net operating revenues would decline by about $177,000 or 2.0% compared to baseline conditions. If conditions in the near future were similar to conditions in 2008, then the model predicts that net operating revenues would decline by $236,000 or 2.4%.

While the aggregate catch limit of **Alternative 2b (Preferred)** equals the sum of the individual catch limits in **Alternative 2a** for gag, red grouper, and black grouper, it would function differently in terms of closing the commercial fisheries. With **Alternative 2b (Preferred)** and given fishing conditions similar to 2007 and 2008, landings of red grouper could exceed the individual catch limit specified in **Alternative 2a**, yet in this case the fishery would not close because the aggregate quota was not filled until a later date. The simulation model would have closed the red grouper fishery with **Alternative 2a** in these instances.

[8] Figures 10a and 10b display the four-year averages of simulated results.

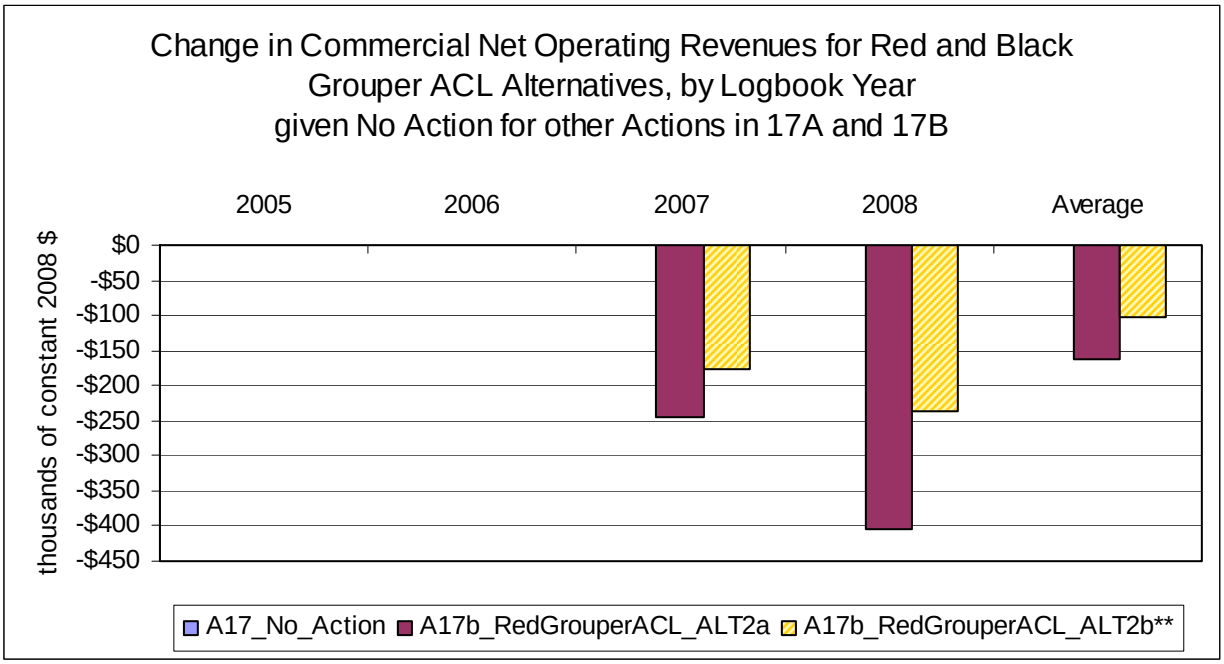


Figure 4-12a. Predicted change in commercial net operating revenues by year for red grouper and black grouper alternatives compared to the No-Action alternative.
Note: ** denotes the Council's preferred alternative.

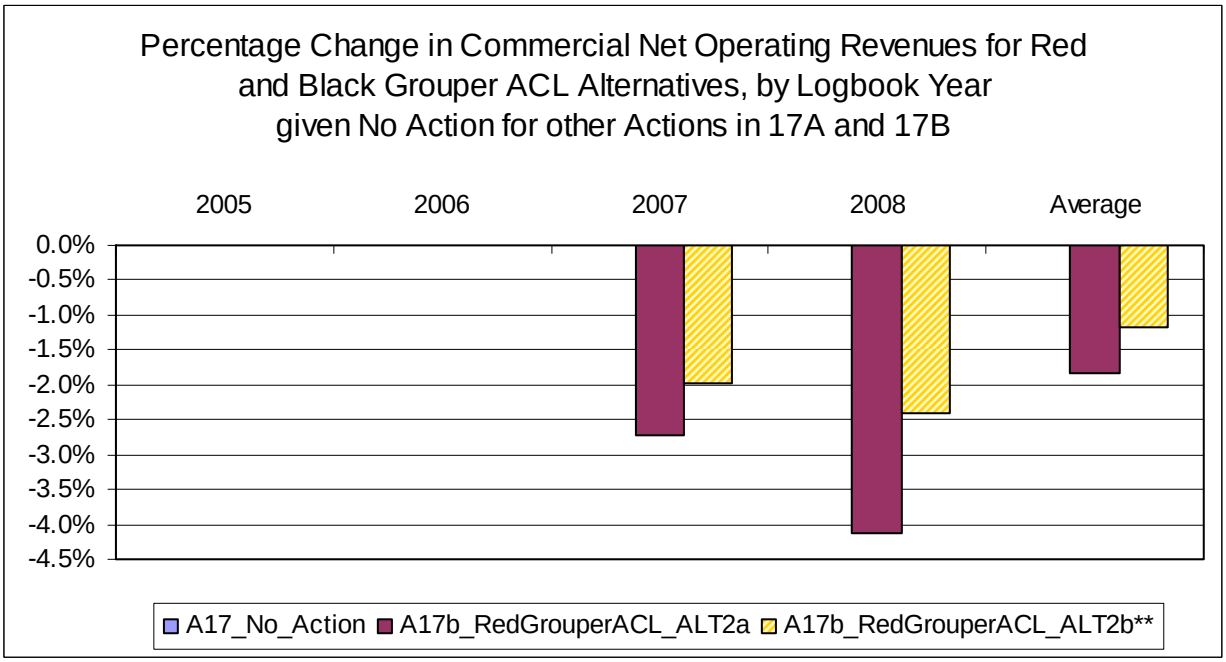


Figure 4-12b. Predicted percentage change in commercial net operating revenues by year for red grouper and black grouper alternatives compared to the No-Action alternative.
Note: ** denotes the Council's preferred alternative.

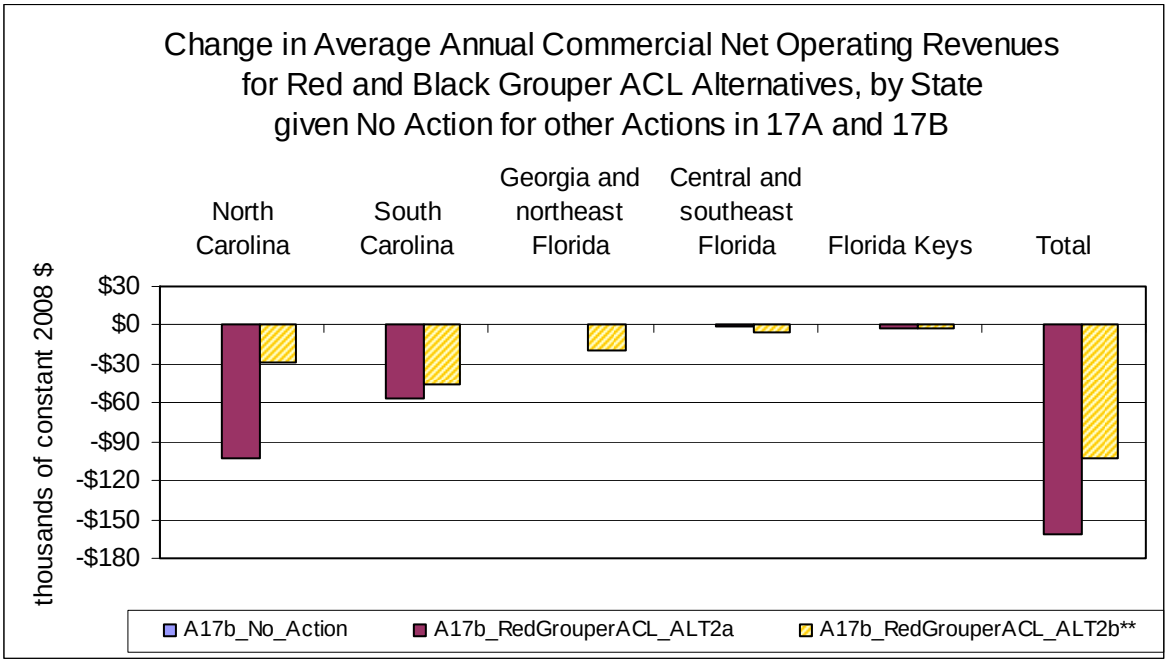


Figure 4-13a. Predicted change in commercial net operating revenues by state of landing for red grouper and black grouper alternatives compared to the No-Action alternative.
Note: ** denotes the Council's preferred alternative.

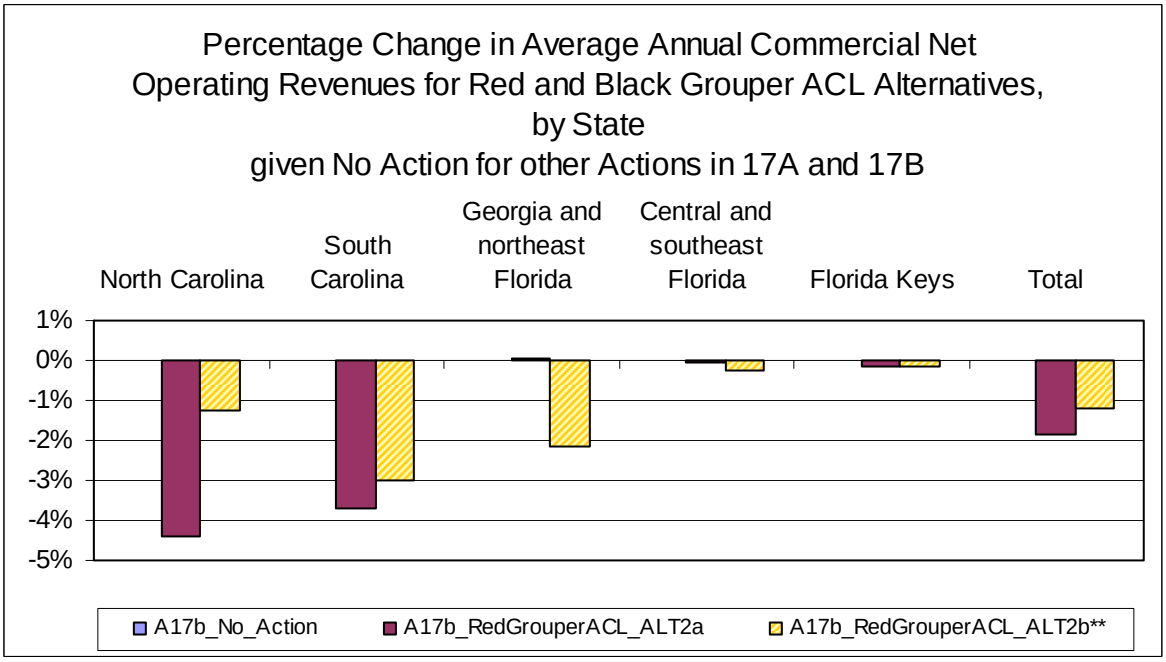


Figure 4-13b. Predicted percentage change in commercial net operating revenues by state of landing for red grouper and black grouper alternatives compared to the No-Action alternative.
Note: ** denotes the Council's preferred alternative.

Alternatives 3-5 do not impose any negative short or long-term economic effects on the commercial fishery.

Recreational Fishery

Alternative 1 (Status Quo) would have no short-term adverse economic effects on the recreational sector, but it could pose some problems on the long-term viability of each of the five fisheries, especially that the recreational sector is a major participant in each of them.

Alternative 2, which provides for various levels of ACLs, would generally establish triggers for the implementation of commercial AMs. While AMs have direct economic impacts, ACLs would condition the implementation of AMs, with lower ACLs likely increasing the probability of implementing AMs. **Preferred Alternative 2b** incorporates an AM but only for the commercial sector, so that the general statement about ACL still holds for the recreational sector. Although both **Alternative 2a** and **Preferred Alternative 2b** provide ACLs based on expected harvests of red and black grouper and gag quota from the implementation of Snapper Grouper Amendment 16, the economic consequences of implementing AMs could differ between the two sub-alternatives. **Alternative 2a** would imply species-specific implementation of AMs while **Preferred Alternative 2b** would trigger an AM implementation for all three stocks. It is then possible that under **Alternative 2a** the economic effects of AMs would be limited to one or two fisheries whereas those effects could affect all three fisheries under **Preferred Alternative 2b**. Indeed, fishers would have more flexibility in adjusting their activities under **Preferred Alternative 2b** so as not to trigger or at least to delay the implementation of AMs.

Alternative 3, which provides for various levels of ACTs, would mainly condition the type of specific management measures for the recreational fishery. Generally, lower ACTs would tend to require more stringent measures resulting in larger adverse economic effects in the short run. In this sense, **Alternative 3a** would be associated with the smallest negative economic effects on the recreational sector, followed by **Alternative 3b** and **Alternative 3c**. It is highly possible that ACTs would be relied upon to trigger implementation of accountability measures, but this condition would not invalidate the just noted relative implications of the various sub-alternatives of **Alternative 3**.

Alternative 4 (Preferred) would appear to provide more stability in the estimation of harvests vis-à-vis the chosen ACL, since there is a good deal of year to year variations in recreational harvests of the subject five species. One year of high harvests due to a variety of reasons could trigger AM implementation when there is actually a downward trend in harvest, or conversely a year of very low harvest would not trigger AM implementation when in fact there is an upward trend in harvest, particularly if this trend is brought about by increasing effort. It would appear then that averaging of harvests over a range of years would potentially allow consideration of both short-term and long-term economic effects.

Alternative 5, which provides for AMs, would have direct economic consequences on the recreational sector, with the timing of the economic effects partly dependent on the stock status. Although not using the ACT to trigger an in-season AM is explicit in **Alternative 5a**, it appears to be implicit in **Alternative 5b (Preferred)**. Both sub-alternatives consider the ACL as the more binding constraint. **Alternative 5a** would delay the adverse economic effects on the recreational sector to the following year via a reduction in the fishing season if the ACL were exceeded in the current year. On the other hand, the adverse economic effects on the recreational sector would be immediate under **Alternative 5b (Preferred)** once the ACL is projected to be met in the current year if one of the species is overfished. ACL reductions in subsequent years could trigger larger adverse economic effects. Considering that projections may be inaccurate, a fishery closure under **Alternative 5b (Preferred)** could unduly penalize the recreational sector. Of course, this could also mean that ACL adjustments in the following year would not result in more severe economic effects. A reverse condition would ensue if the projection inaccuracy were to lead to overharvest of any of the subject species in the current year. Although a fishery closure, in terms of fixed shortened season under **Alternative 5a** or variable shortened season under **Alternative 5b (Preferred)**, would not necessarily result in fishing trip cancellations, benefits would still be negatively affected due to increased fishing costs or reduced quality of fishing. In addition, both sub-alternatives would likely have distributional implications across the various fishing modes likely in proportion to the importance of a species to a particular fishing mode. For example, black sea bass is heavily dominated by the shore/private/rental mode whereas vermilion snapper is dominated largely by headboats (see Table 3-46), thus the adverse economic effects would be more on shore/private/rental mode with respect to black sea bass but more on headboats with respect to vermilion snapper.

There are two more issues worth mentioning regarding the economic effects of the two sub-alternatives of **Alternative 5**. First, **Alternative 5b (Preferred)** would provide better protection to overfished stocks than **Alternative 5a**, implying that the long-run economic effects of **Alternative 5b (Preferred)** would likely be more positive than those of **Alternative 5a**. Second, adoption of **Alternative 5b (Preferred)** could leave uncertain the actual measures for species not considered overfished. Thus, it is possible that the short-run economic values derived from species not overfished may be maintained at the baseline levels, but the long-run economic effects could be severely negative.

Alternative 5c differs from **Alternatives 5a** and **5b** in that, for an overfished species, it would rely on the ACT as the benchmark for triggering an AM. If the ACT is exceeded, harvest and retention of the subject species or species group would be prohibited. In addition, the Regional Administrator would reduce the ACT in the following year by the amount of the overage. Among the three sub-alternatives, **Alternative 5c** would provide the best protection to an overfished stock, resulting in the greatest long-term economic benefits. However, these long-term economic benefits are generated at relatively high costs to the fishing participants. These costs could potentially increase over time if the declining ACT is consistently exceeded year after year.

More recent amendments affecting the various species considered in this section are expected to constrain recreational landings to their respective ACLs. Thus, the ACL/AMs of this amendment would likely have minimal adverse economic effects on the recreational sector in the very near future. One possible exception to this is the case with black sea bass. In 2006, a recreational allocation (ACL) of 409,000 pounds gutted weight (483,000 whole weight) was set, together with a12-inch size limit and a 15-fish bag limit.

The 2005-2008 average recreational landings of black sea bass amounted to 743,184 pounds. In all likelihood, the black sea bass ACL would be reached, and the fishery subsequently closed in the current season or the season reduced in the following year. Based on 2005-2008 monthly recreational landings, the ACL would be reached in December. Implementing a January through May closure would affect about 1,590 charterboat angler trips, 9,658 headboat angler trips, and 18,381 private/rental angler trips. Headboat target trips are derived by taking the proportion of monthly black sea bass landings to monthly snapper-grouper landings of headboats, and then applying the resulting ratio to the monthly headboat angler trips. If the black sea bass ACL could potentially be exceeded, so would the ACT, and under **Alternative 5c**, the negative economic effects on the recreational sector could be substantial. It is also possible that **Alternative 5c** would trigger an AM for the other overfished species, resulting in even larger economic losses to the recreational sector. Whether the potential long-term benefits can outweigh any amount of short-term losses cannot be determined. The Consumer Surplus and Net Operating Revenue reductions affecting the black sea bass fishery are shown in Table 4-24.

Table 4-24. Economic effects of ACL/AM for five species.

	Charter	Headboat	Private/Rental	Total
Consumer Surplus	$2,286,705	$5,507,964	$13,393,573	$21,188,241
Net operating revenue	$203,456	$656,717		$860,173
Total	$2,490,161	$6,164,681	$13,393,573	$22,048,414

4.4.3 Social Effects

Similar to the discussions with regards to golden tilefish and snowy grouper, **Alternative 1 (Status Quo)** would retain the existing regulations for black grouper, black sea bass, bass, gag, red grouper, and vermillion snapper and, as a result, existing quotas and harvest prohibitions would suffice for the establishment of ACLs and AMs for some species and sectors. However, because of the species-sector focus of the ACLs and the absence of quotas for some species and AMs in the recreational sector, **Alternative 1 (Status Quo)** would not fully satisfy the requirements of the Reauthorized Magnuson-Stevens Act and is not a viable long-term option. Additional subsequent management action, with duplicative administrative costs, would be required to address these

deficiencies. As discussed for the other species, the absence of AMs in the recreational sector may benefit the sector in the short-term, but raise the issues of potential over-harvest of the respective species, necessitating the implementation of stricter harvest measures in the long-term for both the commercial and recreational sectors, with associated adverse social and economic effects, as well as raising equity concerns of managing a fishery without substantive effort controls. While subsequent action could be taken to enact any necessary protection, should the need arise, such would be redundant to the current management action and opportunity, incurring a duplication of time and resources to accomplish what could be accomplished under the current amendment.

Alternatives 2a and **2b (Preferred)** would establish sector ACLs based on the expected catch resulting from management measures implemented in Snapper Grouper Amendment 16. **Alternative 2a** would establish the sector-specific ACLs for only red grouper and black grouper, with allowable ACLs for the other species already in place via previous management action. Because the ACLs for red grouper and black grouper equate to current expected harvest levels, their specification would not be expected to require any additional management action to restrict harvests and, therefore no adverse social effects would be expected to accrue to fishermen, associated businesses, or communities.

While **Alternative 2b (Preferred)** would also be based on the harvest expectations resulting from Snapper Grouper Amendment 16, it would establish separate commercial and recreational ACLs equivalent to combined expected catch of red grouper, black grouper, and ACLs for gag. For the recreational sector, because the ACL is equivalent to the sum of the expected harvest of each individual species, no change in social effects would be expected. For the commercial sector, in addition to establishing the ACL, this alternative would establish the commercial AM that would close the commercial fisheries for all shallow water grouper when either the gag quota or the combined commercial ACL for gag, red grouper, and black grouper is projected to be met. Tying the three species together in this manner could result in either short-term adverse or positive social effects. Adverse social effects would occur if accelerated gag harvest results in closure of the entire shallow water grouper commercial fishery, resulting in decreased fishing revenues and associated declines in social benefits to fishermen, associated businesses, and communities. Closure of the shallow water grouper fishery should help protect gag, as closure of the shallow water grouper fishery should help reduce additional gag bycatch mortality in these other fisheries. Reduced harvests of other grouper species may also have beneficial stock effects for these species, with associated potential long-term social and economic benefits. It is unknown, however, whether the benefits of this additional gag protection and possible stock benefits for other grouper species exceed the social costs associated with the prohibition of the harvest of all shallow water grouper species. Combining the species into a single ACL could result in positive short-term benefits, or at least neutral change in social benefits, if gag harvests are circumstantially reduced, due to environmental variability or other factors, and fishermen are able to successfully substitute increased harvests of red grouper or black grouper. Because these species would not be subject to individual ACLs, their harvest could increase relative to historic or expected harvest levels without subsequent closure of the fishery as long as the

aggregate ACL is not exceeded. As a result, fishing flexibility is increased. As long as this flexibility does not jeopardize the condition of these resources, this should increase the social benefits to the fishery relative to single species ACLs.

Alternative 3 would establish an ACT for the recreational sector, with sub-alternatives setting the ACT at different portions of the recreational ACL. While each sub-alternative would establish a different ACT, no change in social effects would be expected to accrue to any of the alternative specifications because each would merely be a benchmark for fishery evaluation and exceeding the ACT would not require any management action. As such, all normal fishery behavior could continue unaffected.

Alternative 4 (Preferred) would establish an AM for the recreational sector that attempts to account for the absence of real-time recreational harvest data. Because final annual harvest data for the recreational sector are not available until the subsequent fishing year, any overage in the previous year would have to be reflected or corrected for by a reduced fishing year the subsequent year. Further, such evaluation would be based on, eventually, a three-year running average. This system should be capable of ensuring that the recreational sector remained responsible for its performance, while protecting the long-term stock, social, and economic benefits. Further, relying on a moving average rather than single-year data should help reduce the adverse effects of over-correction that might occur due to unusual fluctuations in harvest estimates that may be real or result of survey variability. This should result in more stable management, allowable harvest levels, and social benefits.

While **Alternative 4 (Preferred)** deals with the period of review for evaluating performance in the recreational sector and **Alternative 5** specifies the AMs that would be implemented. Under **Alternative 5a,** an AM would be triggered regardless of the stock status, but only if the ACL is exceeded. Because of the delay in final recreational harvest statistics, evaluation of the performance in one year would occur the following year, during which, if the ACL were exceeded the previous year, the Regional Administrator would reduce the length of the fishing season the next year sufficient to ensure the ACL is not exceeded again. By conducting the assessment the second year (final data are only available in the following year), but delaying action until the third year ("…reduce the length of the following fishing year…"), this system may actually allow consecutive overages before corrective action occurs. As a result, the cumulative overage amount could be substantial. Although periodic stock assessments would be conducted and should be capable of and expected to account for the biological impacts of any overages, recreational overages could result in deteriorating stock conditions, or failure to meet recovery goals, where appropriate, resulting in decreased social and economic benefits for both the recreational and commercial sectors.

Also, as stated previously with regards to the AMs for other species, even if no cumulative adverse stock effects are induced, an overage could require a substantial reduction in the length of the next fishing year and result in reduced short-term social benefits due to the narrow prescriptive nature of the accountability measure, which would allow only the season length to be adjusted. It should be noted, however, that imposing

the correction in the third year rather than the second may allow for greater social benefits. The rationale for this is that fishermen, as well as the businesses that cater to their needs, are expected to plan their activities in advance. Announcement and reduction of the season length in the same fishing year may require abrupt closure of the fishery and/or would likely occur after some fishermen and fishing businesses have already planned their activities, and allow little opportunity for adjustment. Announcing a season length reduction for the following fishing year, however, would allow greater opportunity and flexibility for these entities to react to and plan for the change and, therefore, would be expected to result in greater social and economic benefits than same-year adjustment. The net effect of these two considerations, potential cumulative overage effects but increased planning flexibility, are unknown.

Alternative 5b (Preferred) differs from **Alternative 5a** in that the AM for the recreational sector would only be triggered if the species is overfished and shortens the timeframe of assessment and corrective action. Under **Alternative 5b (Preferred)**, harvest assessment would be based on a projection rather than final data, implying the assessment would be conducted in the same fishing year using actual fishing-year data available to date and projecting the remaining harvests for the year based on historical performance (although not specified, it is assumed this process would begin at the point when the first current-year data becomes available, beginning in mid to late spring). If the ACL is projected to be exceeded, the fishing season for the following year would be shortened, as necessary, to prevent consecutive overages. By shortening the evaluation and action process by one year, this alternative would reduce the potential for successive overages, relative to **Alternative 5a**, and substantive cumulative adverse stock effects, thereby reducing the potential for reduced social and economic benefits. **Alternative 5b (Preferred)** would also, similar to **Alternative 5a** and relative to same-year correction, support the social benefits of increased angler and business flexibility by not requiring corrective action in the same fishing year, instead delaying correction until the following year. Additionally, because the correction would be based on projected harvests rather than actual, the potential exists that by the end of the year, no real overage actually occurred (larger than expected harvests early in the year could be followed by reduced harvests the rest of the year, resulting in, overall, a normal year). If such occurs, the season length in the following year could be shortened unnecessarily, resulting in an unnecessary reduction of social and economic benefits. While this may result in increased stock benefits (the shortened season would be presumed to result in lower total harvest, leading to potential stock benefits), the net effect on social benefits is unknown.

Alternative 5c would mimic the specifications, and expected effects, of **Alternative 5b (Preferred)** except that the evaluation target is the ACT rather than the ACL. While the ACT for a stock can be set equal to the ACL, it generally will be set lower than the ACL to afford a buffer to decrease the likelihood of harvest exceeding the ACL. Because of the common components between **Alternative 5c** and **Alternative 5b (Preferred), Alternative 5c** would be expected to result in similar social and economic effects relative to the other alternatives. However, if the ACT is less than the ACL, the lower harvest threshold, while supporting enhanced protection of the resource and maintenance or preservation of social benefit streams, increases the likelihood of triggering AMs. If

normal harvest variability does not warrant the additional buffer an ACT may afford, the lower ACT-based threshold could result in reduced social benefits in the form of foregone benefits during periods when AMs are triggered (by the lower ACT threshold). Further, the lower threshold would be expected to increase the likelihood that projected harvests overestimate actual harvest (final data), increasing the likelihood that AM corrections in the subsequent fishing year occur that may be either totally unnecessary or more severe than necessary.

In summary, **Alternative 1 (Status Quo)** is not a viable long-term alternative because it would not fully satisfy the requirements of the Reauthorized Magnuson-Stevens Act. Its selection would require additional subsequent management action, with duplicative administrative costs. Not all of the remaining alternatives under this action deal with the same management component and, therefore, are not directly comparable. Instead, only sub-sets of alternatives are comparable. **Alternative 2a** would allow current harvests, not be expected to require any additional management measures, and not be expected to result in any adverse social effects. **Alternative 2b (Preferred)** would establish an aggregate ACL for gag, red grouper, and black grouper in addition to single species ACLs and an AM based on single species or aggregate species harvest thresholds. As a result of this aggregate approach, social benefits may increase or decrease, depending on resultant fishery performance and behavior, as gag harvests could result in closure of the fisheries for all three species (diminished social benefits), or increased harvest of the other species could substitute for decreased gag harvests (increased social benefits). The gag resource, and associated social and economic benefits, however, would be expected to be better safeguarded by **Alternative 2b (Preferred)** than under **Alternative 2a**. **Alternative 3** would only establish ACT benchmarks, with no associated necessary management change, and would not be expected to result in any change in social benefits. Because the multi-year perspective of **Alternative 4 (Preferred)** would be capable of addressing the potential variability of recreational harvest estimates, it would be expected to result in increased social benefits relative to single-year assessment and management action. Both **Alternative 5a** and **Alternative 5b (Preferred)** contain sufficient uncertainty of net social effects that ranking is not possible. **Alternative 5b (Preferred)** would base management action on projected harvests rather than actual (final data) and, as a result, may result in unnecessary corrective action, with associated unjustified adverse social effects. Both alternatives would delay corrective action until the subsequent fishing year, which should allow greater flexibility for fishermen and associated businesses to plan activities, resulting in greater social and economic benefits that same-year correction. **Alternative 5c** would be expected to result in social effects similar to **Alternative 5b (Preferred)**. However, because the ACT for a stock will generally be less than the ACL for that stock, using the ACT as the AM-trigger threshold under **Alternative 5c** increases protection of the resource while also increasing the likelihood of reduced social and economic benefits relative to **Alternative 5b (Preferred)** if stock and/or fishery conditions do not warrant the additional stock protection the more conservative ACT limit affords.

4.4.4 Administrative Effects

Alternative 1 (Status Quo) would not produce near-term administrative impacts. However, this alternative would not comply with Reauthorized Magnuson-Stevens Act requirements and therefore, may trigger some type of legal action for not doing so. If this scenario were to occur, the burden on the administrative environment would be great in the future. **Alternative 2a** would produce a minimal negative impact on the administrative environment since most administrative responsibilities were carried out under Snapper Grouper Amendment 16 and there already exists a mechanism by which to monitor the gag quota. **Alternative 2b (Preferred)** would produce a higher level of impact on the administrative environment than **Alternative 2a** because the newly established ACL will need to be monitored each year and no mechanism to track a combined ACL for these species currently exists. Administrative impacts of **Alternative 2c** would be greatest of all since recreational landings would need to be monitored on a continuing basis. Tracking recreational landings is difficult because there is a delay in the availability of recreational data; therefore, the AM chosen as the preferred alternative under Action 4 may be implemented retroactively to address overages occurring over the most recent three year's worth of data. This type of tracking and AM implementation coordination would create a moderate burden on the administrative environment. In ranking the order of impacts of each of the alternatives from the most to the least the ranking would be: **Alternative 2c**, **Alternative 2b (Preferred)**, **Alternative 2a**, and **Alternative 1 (Status Quo).**

Alternative 3 would incur a similar administrative impact as **Alternative 1 (Status Quo)** since the designation of ACTs alone do not require a great deal of administrative action outside of drafting notices informing the public of such actions. **Alternative 4 (Preferred) and Alternative 5**; however, would produce a small negative impact on the administrative environment regardless of the choice of **Sub-alternative 5a**, **Sub-alternative 5b (Preferred),** or **Sub-Alternative 5c**. Under each of the sub-alternatives a notice would need to be drafted and disseminated to fishery participants notifying them of the previous year's overages, and how much the next year's catch level would be reduced or season is shortened.

4.4.5 Council's Conclusions

The Snapper Grouper Advisory Panel (AP) recommended a combined gag and black grouper commercial ACL and a separate red grouper ACL (5 for, 3 against, and 4 abstentions). The AP recommended, following a closure of a fishery based upon the landings for an indicator species, an allowance of spearfishing for the other groupers if their ACL has not been met (5 for, 1 against, and 7 abstentions).

The Law Enforcement Advisory Panel did not have any recommendations.

The Scientific and Statistical Committee (SSC) recommended that the Council consider establishing individual ACLs by species in preference to an aggregate ACL. The SSC believed that that the number of either red grouper or black grouper caught under the combined ACL might exceed the individually derived catches predicted in Amendment 16 without triggering AMs under the aggregate limit.

The Council has chosen **Alternatives 2b** (ACL), **4** (AM), and **5b** (AM sub-alternative) as their preferred alternatives for black sea bass, black grouper, red grouper, gag, and vermilion snapper. **Alternative 2b (Preferred)** would establish combined commercial and recreational ACLs for gag, red grouper, and black grouper based on expected catch resulting from management measures in Snapper Grouper Amendment 16. Combining the three ACLs provides a means by which an ACL can be established for red grouper and black grouper, whose stock status is currently unknown. The combined commercial ACL for all three species would be 662,403 lbs gw, and the combined recreational ACL would be 648,663 lbs gw. It is important to note that SEDAR assessments for red grouper and black grouper will be completed in 2010, after which, the ACLs for red and black grouper may be modified through a framework adjustment if **Alternative 2 (Preferred)** under the "Modification of Framework Procedures" action of this amendment is implemented through rulemaking. The Council chose to not specify a preferred alternative for ACTs. Establishing ACTs for gag, black grouper, red grouper, black sea bass, and vermilion snapper would hedge against the ACL being exceeded; however, it is thought that measures in Amendment 16 will reduce harvest to a level that precludes the need for additional reductions under an ACT.

Using average landings for comparison with the ACL **(Alternative 4 (Preferred))** can buffer peaks in the landings that may be a function of sampling rather than a true estimation of actual harvest. Using an average of landings would help account for data uncertainty and will ensure that AMs are triggered only when appropriate. The Council chose **Alternative 5b (Preferred)** over **Alternative 5a** because closing the fishery when the ACL is met as well as reducing the length of the following fishing year enough to make up for the amount of the ACL overage for an overfished species would likely have a greater biological benefit than only reducing the length of the fishing season. Furthermore, more recent amendments affecting the various species considered in this section are expected to constrain recreational landings to their respective ACLs. Thus,

the ACL/AMs of this amendment would likely have minimal adverse economic effects in the very near future.

The Council recognizes it will be difficult to monitor the recreational catch. However, based on catches shown in Table 4-23c and the expected reductions in catch from the regulations not fully shown, the Council concluded the recreational catches will be below their ACL. If the recreational ACLs are exceeded, the proposed accountability measures will close the recreational fishery if one of the species is overfished or reduce the ACL the following season by the amount of the overage.

The Council concluded the preferred alternatives are sufficient to end/prevent overfishing of black grouper, black sea bass, gag, red grouper, and vermilion snapper; the actions meet the new Magnuson-Stevens Act requirements for these species; and the preferred alternatives best address the SSC's recommendations. The Council also concluded the preferred alternatives best meets the goals and objectives of the Snapper Grouper FMP as amended.

4.5 Update the framework procedure for specification of Total Allowable Catch (TAC) for the Snapper Grouper Fishery Management Plan (FMP) to incorporate Annual Catch Limits (ACLs), Annual Catch Targets (ACTs), and Accountability Measures (AMs).

The Council's current FMPs Framework Procedure for setting TAC **(Appendix J)** provides a mechanism for making changes to allowable catch levels and related management of stocks or stock complexes in a timely manner when stock assessments or new assessment information indicates that changes are needed. Changes that can be made through a Regulatory Amendment (also known as a Framework Action) include biomass levels, age-structured analyses, target dates for rebuilding overfished species, MSY, ABC, TAC, quotas, trip limits, bag limits, minimum sizes, gear restrictions, seasonal or area closures, definitions of essential fish habitat, (EFH), EFH-Habitat Areas of Particular Concern (HAPCs) or Coral HAPCs, and restrictions on gear and fishing activities applicable in EFH and EFH-HAPCs. Under the Reauthorized Magnuson-Stevens Act and the amended guidelines for NS 1 (74 FR 3178), it is also necessary to be able to adjust and establish ACLs, ACTs, and AMs when needed. This action revises the current FMPs Framework Procedure to allow such adjustments under the framework.

The Council is proposing the establishment of ACLs, ACTs, and AMs where needed. Currently, the framework procedures specify that if changes are needed to the TAC, a Council appointed Assessment Group (Group) will advise the Regional Administrator in writing of their recommendations accompanied by the Group's report (where appropriate), relevant background material, draft regulations, Regulatory Impact Review, and public comments. The Council is proposing to update the procedures for specification of TAC in order to incorporate the ACL, ACT, and AM vernacular. With this revision, the specification of TAC section of the framework procedure would be renamed to reflect the 2009 National Standard 1 Guidelines, which define ACL is the primary unit set through management to control harvest levels. As used in the framework procedure, ACL is analogous to the term TAC.

Alternative 1 (Status Quo). Do not include the ability to modify ACLs, ACTs, and AMs in the existing framework procedure.

Current Framework procedure:

I. Establish an assessment group and annual adjustments:

1. The Council will appoint an assessment group (Group) that will assess the condition of selected snapper grouper species in the management unit (including periodic economic and sociological assessments as needed) on an annually planned basis. The Group will present a report of its assessment and recommendations to the Council.

2. The Council will consider the report and recommendations of the Group and hold public hearings at a time and place of the Council's choosing to discuss the Group's report. The Council may convene the Advisory Panel and the Scientific and Statistical Committee to provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

3. If changes are needed in the maximum sustainable yield (MSY), total allowable catch (TAC), quotas, trip limits, bag limits, minimum sizes, gear restrictions, season/area closures (including spawning closures), timeframe for recovery of overfished species or fishing year, the Council will advise the Regional Director in writing of their recommendations accompanied by the Group's report (where appropriate), relevant background material, draft regulations, Regulatory Impact Review and public comments. For wreckfish and any other species under limited access, this report will be submitted each year at least 60 days prior to the start of the fishing season (currently April 16). Biomass levels and age structured analyses are to be added as they become available.

4. The Regional Director will review the Council's recommendations, supporting rationale, public comments and other relevant information. If the Regional Director concurs that the Council's recommendations are consistent with the goals and objectives of the fishery management plan, the national standards and other applicable law, the Regional Director will recommend that the Secretary publish proposed and final rules in the Federal Register of any changes for species managed under limited access prior to the fishing year, and for all other species and/or changes on such dates as may be agreed upon with the Council.

5. Should the Regional Director reject the recommendations, he will provide written reasons to the Council for the rejection, and existing regulations will remain in effect until the issue is resolved.

6. Appropriate adjustments that may be implemented by the Secretary by proposed and final rules in the Federal Register are:

a. Initial specification of MSY and subsequent adjustment of the best estimate of MSY where this information is available for a particular species.

b. Initial specification of acceptable biological catch (ABC) and subsequent adjustment of the ABC range and/or best estimate when and where this information is available for a particular species.

c. Setting TAC for a particular species. A TAC for wreckfish may not exceed 8 million pounds.

d. Modifying (or implementing for a particular species) TAC, quotas (including zero quotas), trip limits, bag limits (including zero bag limits), minimum sizes, gear restrictions (ranging from modifying current regulations to a complete prohibition) and season/area closures (including spawning closures).

e. The fishing year and spawning closure for wreckfish may not be adjusted by more than one month.

f. Authority is granted to the Regional Director to close any fishery, i.e. revert any bag limit to zero and close any commercial fishery, once a quota has been established through the procedure described above and such quota has been filled. When such action is necessary, the Regional Director will recommend that the Secretary publish a notice in the Federal Register as soon as possible.

g. Modifying (or implementing for a particular species) a timeframe for recovery of an overfished species.

h. Initial specification and subsequent adjustment of biomass levels and age structured analyses.

Alternative 2. (Preferred) Update the framework procedure for specification of Total Allowable Catch (TAC) for the Snapper Grouper Fishery Management Plan (FMP) to incorporate ACLs, ACTs, and, AMs. Such modifications would be based upon new scientific information indicating such modifications are prudent.

Table 4-25. Proposed framework modifications.

Items retained from current framework	Items removed from current framework	Items added to current framework
Adjustments to or establishment of MSY	Provision that would not allow fishing year or spawning season closure to be adjusted by more than one month for wreckfish.	Use of SEDAR reports or other documentation the Council deems appropriate to provide biological analyses
Adjustments to ABC	References to the Council-appointed "assessment group"	The SSC prepares a written report to the Council specifying OFL and a range of ABCs for species in need of catch reductions to achieve OY.
Adjustments to or implementation of quotas including closing any commercial fishery when the quota is filled	References to the assessment group report.	The SEDAR report or SSC will recommend rebuilding periods
Adjustments to TAC		
Adjustments to or implementation of trip limits		Adjustment to ACLs and/or sector ACLs
Adjustments to or implementation of bag limits including zero bag limits		Adjustment to or implementation of ACTs
Adjustments to or implementation of minimum sizes		Adjustments to or implementation of AMs
Adjustments to or implementation of gear restrictions		Adjustments to fishing seasons/years
Adjustments to or implementation of seasonal/area closures		
Adjustment to or implementation of timeframes for recovery of an overfished species.		
Initial specification and subsequent adjustments of biomass levels and age structured analysis.		
Inclusion of public input in the framework adjustment process		
SSC's role in providing the Council advise and recommendations for framework adjustments		

Proposed Language for Updated Framework Procedure

I. Snapper Grouper FMP Framework Procedure for Specification of Annual Catch Limits, Annual Catch Targets, Overfishing Limits, Acceptable Biological Catch, and annual adjustments:

Procedure for Specifications:

1. At times determined by the SEDAR Steering Committee, and in consultation with the Council and NMFS Southeast Regional Office (SERO), stock assessments or assessment updates will be conducted under the SEDAR process for stocks or stock complexes managed under the Snapper Grouper FMP. Each SEDAR stock assessment or assessment update will: a) assess to the extent possible the current biomass, biomass proxy, or SPR levels for each stock; b) estimate fishing mortality (F) in relation to F_{MSY} (MFMT) and F_{OY}; c) determine the overfishing limit (OFL); d) estimate other population parameters deemed appropriate; e) summarize statistics on the fishery for each stock or stock complex; f) specify the geographical variations in stock abundance, mortality, recruitment, and age of entry into the fishery for each stock or stock complex; and g) develop estimates of B_{MSY}.

2. The Council will consider SEDAR stock assessments or other documentation the Council deems appropriate to provide the biological analysis and data listed above in paragraph 1. Either the SEFSC or the stock assessment branch of a state agency may serve as the lead in conducting the analysis, as determined by the SEDAR Steering Committee. The Scientific and Statistical Committee (SSC) will prepare a written report to the Council specifying an OFL and may recommend a range of ABCs for each stock complex that is in need of catch reductions for attaining or maintaining OY. The OFL is the annual harvest level corresponding to fishing at MFMT (F_{MSY}). The ABC range is intended to provide guidance to the SSC and is the OFL as reduced due to scientific uncertainty in order to reduce the probability that overfishing will occur in a year. To the extent practicable, the probability that overfishing will occur at various levels of ABC and the annual transitional yields (i.e., catch streams) calculated for each level of fishing mortality within the ABC range should be included with the recommended range.

For overfished stocks, the recommended range of ABCs shall be calculated so as to end overfishing and achieve snapper grouper population levels at or above B_{MSY} within the rebuilding periods specified by the Council and approved by NOAA Fisheries Service. The SEDAR report or SSC will recommend rebuilding periods based on the provisions of the National Standard Guidelines, including generation times for the affected stocks. Generation times are to be specified by the stock assessment panel based on the biological characteristics of the individual stocks. The report will recommend to the Council a B_{MSY} level and a MSST from B_{MSY}. The report may also recommend more appropriate estimates

of F_{MSY} for any stock. The report may also recommend more appropriate levels for the MSY proxy, OY, the overfishing threshold (MFMT), and overfished threshold (MSST). For stock or stock complexes where data are inadequate to compute an OFL and recommended ABC range, the SSC will use other available information as a guide in providing their best estimate of an OFL corresponding to MFMT and ABC range that should result in not exceeding the MFMT.

3. The SSC will examine SEDAR reports or other new information, the OFL determination, and the recommended range of ABC. In addition, the SSC will examine information provided by the social scientists and economists from the Council staff and from the SERO Fisheries Social Science Branch analyzing social and economic impacts of any specification demanding adjustments of allocations, ACLs, ACTs, AMs, quotas, bag limits, or other fishing restrictions. The SSC will use the ABC control rule to set their ABC recommendation at or below the OFL, taking in account scientific uncertainty. If the SSC sets their ABC recommendations equal to OFL, the SSC will provide its rational why it believes that level of fishing will not exceed MFMT.

4. The Council may conduct a public hearing on the reports and the SSC's ABC recommendation at, or prior, to the time it is considered by the Council for action. Other public hearings may be held also. The Council may request a review of the report by its Snapper Grouper Advisory Panel and optionally by its socioeconomic experts and convene these groups before taking action.

5. The Council, in selecting an ACL, ACT, AM, and a stock restoration time period, if necessary, for each stock or stock complex for which an ABC has been identified, will, in addition to taking into consideration the recommendations and information provided for in paragraphs 1, 2, 3, and 4, utilize the following criteria:

> **a.** Set ACL at or below the ABC specified by the SSC or set a series of annual ACLs at or below the projected ABCs in order to account for management uncertainty. If the Council sets ACL equal to ABC, and ABC has been set equal to OFL, the Council will provide its rationale as to why it by it believes that level of fishing will not exceed MFMT.
>
> **b.** May subdivide the ACLs into commercial, for-hire, and private recreational sector ACLs that maximize the net benefits of the fishery to the nation. The Sector ACLs will be based on allocations determined by criteria established by the Council and specified by the Council through a plan amendment. If, for an overfished stock, harvest in any year exceeds the ACL or sector ACL, management measure and catch levels for that sector will be adjusted in accordance with the AMs established for that stock.

c. Set ACTs or sector ACTs at or below ACLs and in accordance with the provision of the AM for that stock. The ACT is the management target that accounts for management uncertainty in controlling the actual catch at or below the ACL. If an ACL is exceeded repeatedly, the Council has the option to establish an ACT if one does not already exist for a particular stock and adjust or establish AMs for that stock as well.

6. The Council will provide the SSC specification of OFL; SSC recommendation of ABC; and its recommendations to the NOAA Fisheries Service Regional Administrator for ACLs, sector ACLs, ACTs, sector ACTs, AMs, sector AMs, and stock restoration target dates for each stock or stock complex, estimates of B_{MSY} and MSST, estimates of MFMT, and the quotas, bag limits, trip limits, size limits, closed seasons, and gear restrictions necessary to avoid exceeding the ACL or sector ACLS, along with the reports, a regulatory impact review and proper National Environmental Policy Act (NEPA) documentation, and the proposed regulations within a predetermined time as agreed upon by the Council and Regional Administrator. The Council may also recommend new levels or statements for MSY (or proxy) and OY.

7. The Regional Administrator will review the Council's recommendations and supporting information, and, if he concurs that the recommendations are consistent with the objectives of the FMP, the National Standards, and other applicable law, he shall forward for publication notice of proposed rules to the Assistant Administrator (providing appropriate time for additional public comment). The Regional Administrator will take into consideration all public comment and information received and will forward for publication in the *Federal Register* of a final rule within 30 days of the close of the public comment, or such other time as agreed upon by the Council and Regional Administrator.

8. Appropriate regulatory changes that may be implemented by final rule in the *Federal Register* include:

a. ACLs or sector ACLs, or a series of annual ACLs or sector ACLs.

b. ACTs or sector ACTs, or a series of annual ACTs or sector ACTs and establish ACTs for stocks which do not have an ACT.

c. AMs or sector AMs.

d. Bag limits, size limits, vessel trip limits, closed seasons or area, gear restrictions, and quotas designed to achieve OY and keep harvest levels from exceeding the ACL or sector ACL.

e. The time period specified for rebuilding an overfished stock, estimated MSY and MSSGT for overfished stocks, and MFMT.

f. New levels or statements of MSY (or proxy) and OY for any stock.

g. New levels of total allowable catch TAC

h. Adjust fishing seasons/years.

9. The NMFS Regional Administrator is authorized, through notice action, to conduct the following activities.

f. Close the commercial fishery of a snapper grouper species or species group that has a commercial quota or sub-quota at such time as projected to be necessary to prevent the commercial sector form exceeding its sector ACL or ACT for the remainder of the fishing year or sub-quota season.

g. Close the recreational fishery of a snapper grouper species or species group at such time as projected to be necessary to prevent recreational sector ACLs or ACTs from being exceeded.

h. Reopen a commercial or recreational season that had been prematurely closed if needed to assure that a sector ACL or ACT can be reached.

10. If NMFS decides not to publish the proposed rule for the recommended management measures, or to otherwise hold the measures in abeyance, then the Regional Administrator must notify the Council of its intended action and the reasons for NMFS concern along with suggested changes to the proposed management measures that would alleviate the concerns. Such notice shall specify: 1) The applicable law with which the amendment is inconsistent; 2) the nature of such inconsistencies; and 3) recommendation concerning the action that could be taken by the Council to conform the amendment to the requirements of applicable law.

II. Establish a procedure to allow for rapid modification to definitions of Essential Fish Habitat (EFH); establishment of new, or modification of existing, Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs); and establishment of new, or modification of existing, Coral-Habitat Areas of Particular Concern.

This adjustment procedure will allow the Council to add or modify measures through a streamlined public review process. As such, measures that have been identified could be implemented or adjusted at any time during the year. The process is as follows:

1. The Council will call upon the Habitat and Environmental Protection Advisory Panel (Panel) for EFH-related actions and the Coral Advisory Panel for Coral-HAPC related actions. The Habitat and/or Coral Advisory Panel(s) will present a report of their assessment and recommendations to the Council.

2. The Council may take framework action one or more times during a year based on need. Such action(s) may come from the Panel report or the Council may take action based on issues/problems/information that surface separate from the Panel. The steps are as follows:

A. Habitat or Coral Advisory Panel Report - The Council will consider the report and recommendations of the Panel and hold public hearings at a time and place of the Council's choosing to discuss the Panel's report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the Panel's report and provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

B. Information separate from Panel Report - The Council will consider information that surfaces separate from the Panel. Council staff will compile the information and analyze the impacts of likely alternatives to address the particular situation. The Council staff report will be presented to the Council. A public hearing will be held at the time and place where the Council considers the Council staff report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the staff report and provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

3. If the Council determines that an addition or adjustment (e.g., in a species or species complex definition of EFH or EFH-HAPCs or a new EFH-HAPC is proposed for a species or species complex) to EFH, EFH-HAPCs, or Coral-HAPCs is necessary to meet the goals and objectives of the Habitat Plan, it will recommend, develop, and analyze appropriate action over the span of at least two Council meetings. The Council will provide the public with:

A. Advance notice of the availability of the recommendation.

B. The appropriate justifications, and biological, economic, and social analyses.

C. An opportunity to comment on the proposed adjustments prior to and at the second Council meeting.

4. After developing management actions and receiving public testimony, the Council will then submit the recommendation to the Regional Administrator. The Council's recommendation to the Regional Administrator must include supporting rationale, an analysis of impacts, and a recommendation to the Regional Administrator on whether to publish the management measure(s) as a final rule.

5. If the Council recommends that the management measures should be published as a final rule, the Council must consider at least the following factors and provide support and analysis for each factor considered:

A. Whether the availability of data on which the recommended management measures are based allows for adequate time to publish a proposed rule.

B. Whether regulations have to be in place for an entire harvest/fishing season.

C. Whether there has been adequate notice and opportunity for participation by the public and members of the affected industry in the development of the Council's recommended management measures.

D. Whether there is an immediate need to protect the resource.

E. Whether there will be a continuing evaluation of management measures adopted following their promulgation as a final rule.

6. If, after reviewing the Council's recommendation and supporting information based on the FMP and the administrative record:

A. The Regional Administrator concurs with the Council's recommended management measures and determines that the recommended management measures may be published as a final rule then the action will be published in the Federal Register as a final rule; or

B. The Regional Administrator concurs with the Council's recommendation and determines that the recommended measures should be published first as a proposed rule, the action will be published as a proposed rule in the Federal Register. After additional public comment, if the Regional Administrator concurs with the Council recommendation, the action will be published as a final rule in the Federal Register; or

C. The Regional Administrator does not concur, the Council will be notified, in writing, of the reason for non-concurrence and recommendations to address those concerns.

7. Appropriate adjustments that may be implemented by the Secretary by proposed and final rules in the Federal Register are:

A. Definition of or modification of a current definition of Essential Fish Habitat for a managed species or species complex.

B. Establishment of or modification of EFH-HAPCs for managed species or species complex.

C. Establishment of or modifications of Coral-HAPCs.

D. Description, identification, and regulations of fishing activities to protect EFH and EFH-HAPCs.

E. Management measures to reduce or eliminate the adverse effects of fishing activities or fishing gear on EFH or EFH-HAPCs.

F. Regulations of EFH-HAPCs.

4.5.1 Biological Effects

The Council currently has at its disposal, three different regulatory vehicles for addressing fishery management issues for any species in the snapper grouper fishery. First, a full amendment may be developed to implement management measures to alter the undesired level of mortality. The amendment process can take anywhere from one to three years dependent upon the type of NEPA document needed to support the amendment actions. Second, the Council may vote for a interim or emergency rule that could remain effective for 180 days with the option to expend it for an additional 186 days. Interim, and/or emergency rules are only meant to act as short-term management tools while permanent regulations are being developed through an FMP amendment. Third, the Council may prepare a regulatory amendment based on the current framework procedures which include biomass levels, age-structured analyses, target dates for rebuilding overfished species, MSY, ABC, TAC quotas, trip limits, bag limits, minimum

sizes, gear restrictions, seasonal or area closures, definitions of, EFH, EFH-HAPCs or Coral HAPCs, and restrictions on gear and fishing activities applicable in EFH and EFH-HAPCs. Typically, framework actions can take about nine months to implement, and are effective until modified.

Alternative 1 (Status Quo) would not modify the current framework procedures to include adjustments to ACLs, ACTs, and AMs. This would maintain the Regional Administrator's current ability to adjust TAC, quotas, trip limits, bag limits, size limits, seasonal closures, and area closures; however, there would exist no means of making needed adjustments to the NS1 harvest parameters in a timely manner. Often, when a harvest reduction is needed, corrective action is required quickly. Not allowing ACLs, ACTs, and AMs to be adjusted through framework would most likely lead to extended delays in implementation of harvest reductions and/or associated AMs. Such a scenario could be biologically detrimental since excessive levels of fishing mortality, or even overfishing would persist until the appropriate harvest limitations could be put in place through amendment action. Alternately, if new data shows a stock is doing better than previous assessments indicate and more restrictive management measures are maintained, unnecessary harvest restrictions could prevent the fishery from harvesting its optimum yield. Under **Alternative 2 (Preferred),** adjustments to ACLs, ACTs, and AMs could be made with relative ease as new fishery and stock abundance information becomes available. **Alternative 2 (Preferred)** would likely be biologically beneficial for any species to which an ACL, ACT, and/or AM is assigned. By changing the current framework procedures to allow for periodic adjustments to NS 1 harvest parameters, management measures could be altered in a timely manner to implement harvest level changes or AMs in response to stock assessment or survey results. In the South Atlantic Region, 10 ACLs will be set, or defined based on current quotas and allocations, for species undergoing overfishing and many more will be set for a multitude of snapper grouper species not undergoing overfishing (**Appendix D**). Allowing ACL adjustments to be made through framework actions could eliminate the need to prepare and analyze individual amendments or amendment actions for each adjustment needed. Framework actions are implemented by the Regional Administrator and require less public and Council participation when compared to the lengthy amendment process. The majority of public participation and Council weigh-in on framework issues typically takes place when the framework procedures are initially drafted during the amendment process, as is the case here. This reduces the need for long public comment periods and periods of consideration by the Council. Eliminating these time-consuming factors would enable harvest modifications to be expedited when they are most needed.

Alternative 2 (Preferred) would add ACLs, ACTs, and AMs to the current list of items able to be modified through framework actions. In the South Atlantic, ACLs are likely to be the most utilized NS 1 parameter as a benchmark against which harvest overages would be measured. In most cases, the ACL would determine when an AM is triggered, and thus carries a great deal of importance to fisheries management. Therefore, it is imperative to be able to adjust any given sector or annual ACL in a timely manner in order to implement appropriate harvest levels to optimize the fishery while ensuring sustainability of snapper grouper stocks.

ACTs may not be established for each snapper grouper stock; however, including an allowance for the establishment and adjustment ACTs in the framework procedure would ensure the ability NOAA Fisheries Service to use them as a management tool if needed. ACTs can be useful as AM triggers when set lower than the ACL, which could act as a buffer to limit the likelihood of an ACL being exceeded. If an ACL is exceeded repeatedly for a species that does not have an ACT, the framework would allow an ACT to be established, which would incorporate a stop gap measure to limit the possibility that the ACL would continue to be exceeded, or be exceeded by excessive amounts.

Alternative 2 (Preferred) would also provide a means by which AMs could be modified. Adding AMs to the framework procedures, in addition to ACLs and ACTs, builds in a level of flexibility for the Regional Administrator to make adjustments to any combination of these parameters in order effectively and efficiently reduce catch levels, and prevent future ACL overages. Revising the current FMP Framework Procedure will not directly affect the protected species, because these parameters are not used in determining immediate harvest objectives.

Regardless of how the current framework procedures are modified, those changes will have no immediate effect on protected species because those changes will not cause immediate changes in harvest objectives.

4.5.2 Economic Effects

There is likely to be no direct economic impacts resulting from **Alternative 2 (Preferred)** since it is expected that the changes that will occur are simply changes in terminology. However, the action will enable framework actions to be implemented more quickly than actions through the amendment process since they require less public and Council participation. Eliminating these time-consuming factors would enable harvest modifications to be expedited when they are most needed and this could improve management of the stocks and indirectly increase long-term economic benefits.

4.5.3 Social Effects

Updating the framework procedure for specification of TAC to incorporate ACLs, ACTs, and AMs is an administrative action. Because this it is an administrative action, it would not be expected to result in any direct social effects on fishermen, associated businesses, or fishing communities. Direct effects would only accrue to subsequent management action that occurs in response to evaluation of the fishery with respect to these parameters and any corrective action that results in response to that evaluation. The framework procedure, however, is intended to support more timely and responsive management, reducing the administrative cost of action and, potentially, reducing the severity of the action and/or achieving the goals of corrective action more quickly, thereby reducing the adverse social and economic effects on the fishery, associated businesses, and fishing

communities or allowing the social and economic benefits of the action to be received sooner.

Alternative 1 (Status Quo), would not modify the Snapper Grouper FMP framework procedure for setting TAC**.** Because the status quo would not add ACLs, ACTs, and AMs as items that can be modified under the framework, **Alternative 1 (Status Quo)** would not support the indirect benefits discussed in the previous paragraph that the inclusion of these parameters into the framework would be expected to receive.

Alternative 2 (Preferred) would add ACLs, ACTs, and AMs as items that can be modified under the framework. As discussed above, modifying the framework is an administrative action and would not be expected to result in any direct economic effects on the fishery or associated businesses. However, as discussed above, expansion of the framework procedure would be expected to support more efficient and effective management, allowing necessary management measures to be implemented more quickly, potentially lessening their severity or allowing benefits to be achieved more quickly. In the long term, positive social and economic effects, relative to the status quo, would be expected from future fishery improvements that may result from more timely adjustments of these parameters. It is noted, however, that because framework procedures are implemented more rapidly than plan amendments, there may be some concern that public participation in the decision process may be reduced relative to that which may occur under the normal plan amendment process and, as a result, the resultant final action may not be as reflective of public concerns as an action developed under a plan amendment.

In summary, **Alternative 1 (Status Quo)** would not modify the framework procedure for setting TAC and would not support more efficient and effective management of the fishery. **Alternative 2 (Preferred)** would increase the types of management measures that could be modified under the framework. This would be expected to increase the efficiency and effectiveness of management change, potentially allowing less severe corrective action when necessary, or the quicker receipt of social and economic benefits associated with less restrictive management. In the long term, positive social and economic effects, relative to the status quo, would be expected from more timely management adjustments.

4.5.4 Administrative Effects

Alternative 1 (Status Quo) would be the most administratively burdensome of the two alternatives being considered, because all modifications to ACLs, ACTs, and AMs would need to be implemented through an FMP amendment, which is a more laborious and time consuming process than a framework action. **Alternative 2 (Preferred)** would incur less of an administrative burden than **Alternative 1 (Status Quo)** since several steps in the lengthy amendment process would be eliminated if the Regional Administrator were given the latitude to adjust ACLs, ACTs, and AMs through framework actions.

4.5.5 Council's Conclusions

The Snapper Grouper Advisory Panel, in an unanimous vote, request the Council add changes to the black sea bass pot fishery (such as changes to allowable pot numbers) be added to the framework.

The Law Enforcement Advisory Panel did not have any recommendations.

The Scientific and Statistical Committee (SSC) did not have any recommendations.

The Council chose to update the current framework procedures to include ACLs, ACTs, and AMs. **Alternative 2 (Preferred)** would be expected to increase the efficiency and effectiveness of management change, potentially allowing less severe corrective action when necessary, or the quicker receipt of social and economic benefits associated with less restrictive management. Additionally, **Alternative 2 (Preferred)** would likely be biologically beneficial for any species to which an ACL, ACT, and/or AM is assigned. By changing the current framework procedures to allow for periodic adjustments to National Standard 1 harvest parameters, management measures could be altered in a timely manner to implement harvest level changes or AMs in response to stock assessment or survey results.

The Council concluded the preferred alternative provides the necessary flexibility to respond quickly to new stock assessment information and to changes in the snapper grouper fishery. The Council also concluded the preferred alternative meets the requirements of the reauthorized Magnuson-Stevens Act and best meets the goals and objectives of the snapper grouper fishery management plan as amended.

4.6 Research Needs

Vermilion snapper, gag, snowy grouper, golden tilefish, black sea bass, and red snapper have been assessed through the SEDAR process. After completion of these assessments, research needs have been identified by the SEDAR workgroup and made available. These needs have been identified and prioritized in the MARFIN request for proposals. Furthermore, a summary of current research will be provided in the snapper grouper SAFE Report (NMFS 2005), which is considered to be a "living" document that will be updated as new data become available.

Biological research needs that have been identified through the SEDAR process are as follows:

4.6.1 Vermilion Snapper

- Quantify discard rates especially in commercial fishery. Estimate discard mortality rates by depth and fishery.
- Research management measures that will reduce release mortality.
- Age sampling from commercial, headboat, and MRFSS that is representative.
- Develop better abundance indices that cover a broader spatial/seasonal scale.
- Fecundity estimates by length and age.
- Collect data on the magnitude and size/age composition of vermilion snapper that are discarded by fishery and gear.
- Develop an index of recruitment.
- Investigate methods of weighting applied to the input data.
- Expand MARMAP area coverage, and include more deep-water habitat.
- Incorporate commercial logbooks for use as an abundance index.
- Increase number of age samples, with a minimum of 500 samples annually for specific fishery segments (i.e., hook and line and headboat).
- Externally combine the indices of abundance into one index to be used in parallel with the existing age-structured model, rather than including the individual indices.

4.6.2 Gag

- Continue research on the use of otolith chemistry to evaluate the population structure of gag.
- Continue genetic research on gag population structure. Add Mexican (Campeche) samples to determine patterns of gene flow and population connectivity.
- Continue workshops on aging and reproductive biology, targeting gag and similar species to eliminate potential methodological differences.
- Long-term continuous monitoring of age structure should be undertaken in the South Atlantic to test the hypothesis that annual recruitment trends are similar between regions.

- Continue oceanographic modeling efforts of recruitment and larval transport associated with development of an Integrated Coastal Ocean Observing System (ICOOS).
- Additional tagging studies should be conducted off the east coast of Florida to examine the extent of northerly and southerly movements.
- Increase sampling to obtain otoliths for aging.
- Improvement in at-sea observation for discards.
- Continue education of samplers for species identification.
- Conversions are needed for different market categories (gutted, headed, filleted, whole weight).
- Data are needed on effort and discards by depth.
- A fishery independent index of abundance should be developed.
- The gag mature sex ratio is needed, from which it may be possible to infer information about male fertility and the number of sperm required for successful fertilization.
- Reconstruct the catch and total removals history (prior to 1962) from data sources not currently being used in the assessment.
- Employ DNA tagging to provide an independent snapshot of total mortality.
- Effectiveness of effort from technological changes should be examined.

4.6.3 Black sea bass

- Age sampling from commercial, headboat, and MRFSS.
- Increased fishery independent sampling.
- Update fecundity information by age and length.
- Age structured models that will take into consideration historical landings.
- Estimates of release mortality by depth and fishery.
- Determine if changes in fishing operations, including species composition of the landings, might reflect catch ability of black sea bass that has not been taken into account by the assessment.
- Index of recruitment.
- Estimate the magnitude, direction, geographic extent, timing, and management implications of mixing north and south of Cape Hatteras.
- Behavioral dynamics associated with reproduction should be investigated with respect to the effects of size selective harvesting.

4.6.4 Golden tilefish

- Develop standardized techniques for aging golden tilefish. Resolve discrepancies in aging from different institutions. Additional research is needed to verify and validate age determinations.
- Sampling programs are needed to quantify discard rates. Research is also needed to identify management measures that will reduce discard mortality.
- Expand fishery-independent sampling of tilefish.

- Representative age, length, and sex composition data are needed for all fisheries (commercial, MRFSS, headboat), gear, seasons, and areas.
- Additional life history and biological research is needed to cover the full geographic range of the species.
- Fecundity information by age and length.

4.6.5 Snowy grouper

- Develop standardized techniques for aging snowy grouper. Resolve discrepancies in aging from different institutions. Additional research is needed to verify and validate age determinations.
- Sampling programs are needed to quantify discard rates. Research is also needed to identify management measures that will reduce discard mortality.
- Expand fishery-independent sampling of snowy grouper.
- Representative age, length, and sex composition data are needed for all fisheries (commercial, MRFSS, headboat), gear, seasons, and areas.
- Additional life history and biological research is needed to cover the full geographic range of the species.
- Fecundity information by age and length.
- Further research is needed into the implication of sex change for fishery management.

4.6.6 Black grouper, Red grouper, Speckled hind, and Warsaw grouper

Black grouper, red grouper, speckled hind and warsaw grouper have not been assessed through the SEDAR process and therefore no research recommendations have been specified for these species. Black grouper and red grouper are scheduled to be assessed in 2009 through SEDAR 19 and speckled hind and warsaw grouper are scheduled to be assessed in 2013 through SEDAR 29.

Although research recommendations have not been specifically identified, some general research recommendation for other assessed species would apply. These recommendations include:

- Identify the complete catch of commercial fishermen. Determine percentage of catch retained, species composition of released fishes and fate of those fishes.
- Age composition of commercial and recreational discards is needed.
- At-sea observers for monitoring discards and developing CPUE indices.
- Develop standardized techniques for aging reef fishes. Resolve any discrepancies in fish age estimates by different institutions.
- For all reef fish species, representative age, length, and sex composition data are needed for all fisheries (commercial, MRFSS, headboat), gear, seasons, and areas.
- Provide estimates of ages determined from fishes caught with fishery-independent gear.
- Recruitment indices for reef fishes.
- Age specific estimates of natural mortality (M).

- Thoroughly examine estimates of natural mortality (M) and steepness (h) in a workshop setting.
- Estimate predator-prey interactions.
- Bioenergetics and trophic relationships needed for ecosystem management.
- Additional life history and biological research is needed for many species to cover the full geographic range of the species.
- Further research is needed into the implication of sex change for fishery management.
- Identify spawning locations, duration, periodicity, and determine if there is spawning migration.
- Fecundity information, batch fecundity, spawning frequency by age and length.

4.6.7 Socio-cultural Research Needs

Socio-cultural research needs that have been identified by the Council's Scientific and Statistical Committee are as follows:

1. Identification, definition and standardization of existing datasets to meet short-term social analysis needs (e.g. behavioral networks based on annual rounds). Centrally locate these datasets so they are accessible to researchers and managers (realizing the constraints imposed by confidentiality);

2. Development of new variables to meet long-term social analytical needs (e.g., community health, individual health, decision-making patterns, cumulative impacts of endogenous, exogenous, and regulatory factors);

3. Longitudinal Data – monitoring needs, including historical, ethnographic, and quantitative data over time;

4. Traditional ecological knowledge/local fisheries knowledge (TEK/LFK) constructions along with scientific ecological knowledge (SEK);

5. State data (license/permit data; social survey type data) and coordination between agencies/levels;

6. Better integration of social, biological and economic variables in modeling efforts; and

7. Better efforts to include humans and human behavior in the ecosystem-based framework (e.g., representation of humans as keystone predators in the system);

Economic research needs that have been identified by the Council's Scientific and Statistical Committee are as follows:

The following issues were identified as being impediments to conducting economic research:

- Confidentiality of state data and data collected through federal research projects.
- Data collected through certain agency grants cannot be distributed without dealing with confidentiality issues.
- The inability to display confidential data.

Commercial

1. Explore the feasibility of developing computable general equilibrium models, which can incorporate the entire economy and important ecosystem components (medium priority, high cost).
2. Develop an input output model for the South Atlantic commercial fisheries. This model should be similar to the NOAA Fisheries Service model for other regions on shore-based communities (medium priority, high cost).
3. Consider alternative ways to collect data on both a social and economic basis e.g. partnerships to develop projects (high priority, medium cost).
4. Ensure availability, improve upon and collect basic data: catch, employment, effort, price, cost/earnings (very high priority, high cost).
5. Opportunity costs - rely on the studies completed in the past on the next best jobs. Include collection of data to estimate worker satisfaction bonus.
6. Integrated biological, social and economic models including dynamic optimization models.
7. Demand analysis – include the effects of imports. Studies of value added product e.g. branding and marketing strategies.
8. Include data collection and analysis on the processing sector, retail sector.
9. Research on the economic and social effects of capacity reduction.
10. Employment in the primary and secondary sectors of the fishing industry that also includes research on household budgets.
11. Cumulative impacts – economic and social.
12. Models to predict fishing behavior in the face of fishing regulations. This would include description of fishing rounds on a seasonal basis and fishing behavioral networks.
13. Non-consumptive and non-use benefits of marine protected species and essential fish habitat/habitat areas of particular concern. Also, measure the socio-cultural benefits of these species.
14. Research on live product/whole weight conversion factors on a seasonal basis possibly through the TIP program or through other biological sampling programs.

Recreational

1. Assess the feasibility of developing benefits transfer models from existing data and the MRFSS. Complete recreational demand models that are more relevant for fisheries management. These models should focus on policy relevant variables (bag, size limits, individual species and species groups). (high priority, low/medium cost)

2. Develop random utility models for predicting participation changes, economic value and behavior of recreational fishermen. (high priority, high cost for data collection).
3. Develop targeted input-output model to estimate the effects of policy changes on the economic impacts of recreational fishing. Will provide information on jobs, wages, income on affected sectors such as lodging, restaurants, bait and tackle shops, marinas, boats (medium priority, high cost).
4. Include categories/motivations of recreational anglers in models outlined in items 1 and 2 (medium priority, high cost).
5. Collect data on motivations/behavioral patterns of recreational fishermen. (medium priority, high cost).
6. Characterize participants in subsistence fisheries. (low priority, high cost).
7. Develop Valuation models and I/O models for tournament fishing. (medium priority, high cost).
8. Develop cost-earnings model for the for-hire sector (charter and headboat). (high priority, high cost). NOAA Fisheries Service is currently conducting a study.

Ecosystem based management

1. Conduct analyses to facilitate the economic valuation of ecosystem services (very high priority, high cost).
2. Explore the use of ecopath and ecosim (very high priority, high cost).

4.7 Cumulative Effects

As directed by NEPA, federal agencies are mandated to assess not only the indirect and direct impacts, but the cumulative impacts of proposed actions as well. NEPA defines a cumulative impact as *"the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time"* (40 C.F.R. 1508.7). Cumulative effects can either be additive or synergistic. A synergistic effect is when the combined effects are greater than the sum of the individual effects.

Various approaches for assessing cumulative effects have been identified, including checklists, matrices, indices, and detailed models (MacDonald 2000). The Council on Environmental Quality (CEQ) offers guidance on conducting a Cumulative Effects Analysis (CEA) in a report titled "Considering Cumulative Effects under the National Environmental Policy Act". The report outlines 11 items for consideration in drafting a CEA for a proposed action.

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.
2. Establish the geographic scope of the analysis.
3. Establish the timeframe for the analysis.
4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.
5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.
6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
7. Define a baseline condition for the resources, ecosystems, and human communities.
8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
9. Determine the magnitude and significance of cumulative effects.
10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
11. Monitor the cumulative effects of the selected alternative and adapt management.

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

4.7.1 Biological

SCOPING FOR CUMULATIVE EFFECTS

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

The 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 **(Section 4.0)**;
II. Which resources, ecosystems, and human communities are affected **(Section 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. In light of the available information, the extent of the boundaries would depend upon the degree of fish immigration/emigration and larval transport, whichever has the greatest geographical range. Therefore, the proper geographical boundary to consider effects on the biophysical environment is larger than the entire South Atlantic EEZ. The ranges of affected species are described in **Section 3.2.1**, which is hereby incorporated by reference. The most measurable and substantial effects would be limited to the South Atlantic region.

3. Establish the timeframe for the analysis.

Establishing a timeframe for the CEA is important when the past, present, and reasonably foreseeable future actions are discussed. It would be advantageous to go back to a time when there was a natural, or some modified (but ecologically sustainable) condition. However, data collection for many fisheries began when species were already fully exploited. Therefore, the timeframe for analyses should be initiated when data collection began for the various fisheries. In determining how far into the future to analyze cumulative effects, the length of the effects will depend on the species and the alternatives chosen. Long-term evaluation is needed to determine if management measures have the intended effect of improving stock status. Therefore, analyses of effects should extend beyond the time when these overfished stocks are rebuilt. Monitoring should continue indefinitely for all species to ensure that management measures are adequate for preventing overfishing in the future. A complete description of monitoring methods that would be employed under this amendment appears in **Section 4.14** of this document, and is incorporated herein by reference.

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 speckled hind, warsaw grouper, golden tilefish, snowy grouper, and red snapper.

A. Past

The reader is referred to **Section 1.3 History of Management** for past regulatory activity. These include bag and size limits, spawning season closures, commercial quotas, gear prohibitions and limitations, area closures, and a commercial limited access system.

Snapper Grouper Amendment 13C was implemented on October 23, 2006. Amendment 13C established quotas, trip limits, and bag limits to end overfishing of snowy grouper, golden tilefish, vermilion snapper, and black sea bass. It also increased harvest of red porgy consistent with the rebuilding program.

Snapper Grouper Amendment 14 was implemented on February 12, 2009. Implementing regulations established eight Type 2 Marine Protected Areas (MPAs) in federal waters ranging from North Carolina to Florida (see Figure 4-14). A Type 2 MPA is an area within which fishing for or retention of snapper grouper species is prohibited but other types of legal fishing, such as trolling, are allowed. The prohibition on possession does not apply to a person aboard a vessel that is in transit with fishing gear appropriately stowed. MPAs are being used as a management tool to promote the optimum size, age, and genetic structure of slow growing, long-lived deepwater snapper grouper species (speckled hind, snowy grouper, warsaw grouper, yellowedge grouper, misty grouper, golden tilefish, blueline tilefish, and sand tilefish). Because of the small sizes of the MPAs, it is unlikely that any significant reductions in overall mortality of species also affected by Snapper Grouper Amendment 17B would occur. Therefore, biological effects of the MPAs would not significantly add to or reduce the anticipated biological benefits of management actions in Amendment 17B.

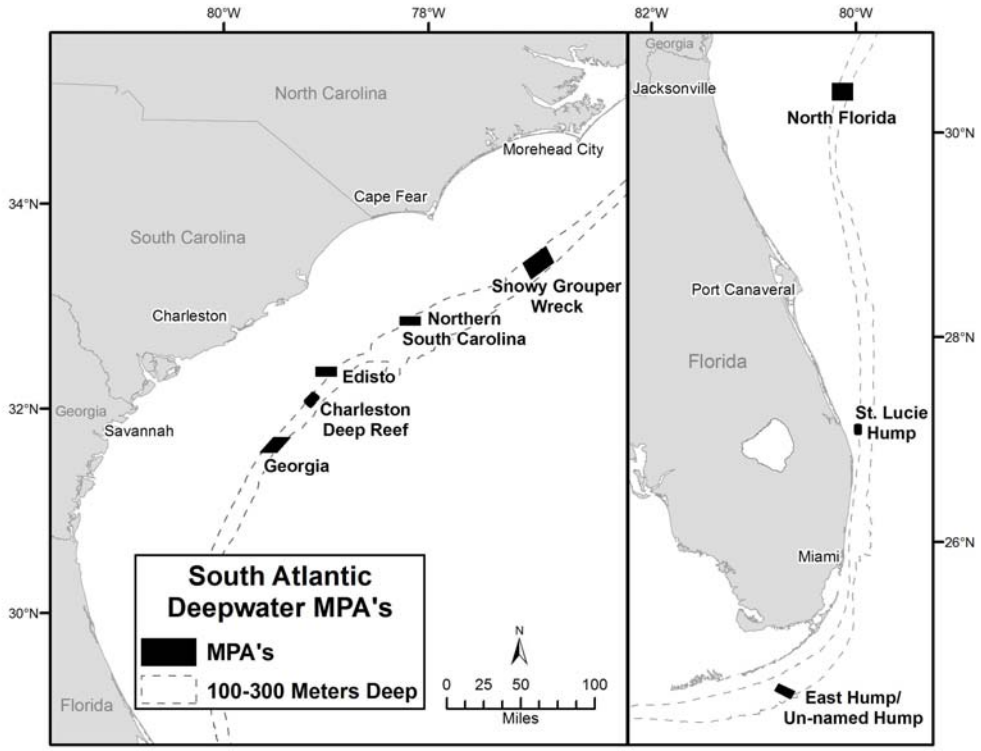


Figure 4-14. Marine protected areas implemented under Snapper Grouper Amendment 14 (SAFMC 2007).

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.

Most recently, Snapper Grouper Amendment 16 to the FMP for the Snapper Grouper Fishery of the South Atlantic Region (SAFMC 2008c) was partially approved by the Secretary of Commerce; all regulations were effective as of 7/29/09. Amendment 16 includes provisions to extend the shallow water grouper spawning season closure, create a five month seasonal closure for vermilion snapper, require the use of dehooking gear if needed, reduce the aggregate bag limit from five to three grouper, and reduce the bag limit for black grouper and gag to one gag or black grouper combined within the aggregate bag limit. The expected effects of these measures include significant reductions in landings and overall mortality of several shallow water snapper grouper species including gag, black grouper, red grouper, and vermilion snapper. In addition, the use of dehooking tools may reduce the release mortality of red snapper that are incidentally caught while fishing for other snapper grouper species.

The shallow water spawning season closure for grouper in Amendment 16 extends from January through April. If **Alternative 4 (Preferred)** under the speckled hind/warsaw grouper action in Snapper Grouper Amendment 17B is also implemented through rulemaking, a large portion of the EEZ would theoretically be closed to most fishing for snapper grouper species January through April because **Alternative 4 (Preferred)** includes a year-round closure for deepwater snapper grouper species in depths greater than 240 feet. This would preclude much of the effort shift into deeper water that may have otherwise taken place as a result of the spawning season closure in Snapper Grouper Amendment 16. Some species would still be available for harvest such as black sea bass, vermilion snapper, and golden tilefish. However, those species are managed under commercial quotas and any effort shift into those fisheries as a result of the combined effects of Snapper Grouper Amendments 16 and 17B could cause the quotas to be met faster shutting down both fisheries sooner than usual. Other species not listed as shallow water species in Amendment 16 and not listed as deepwater species in Amendment 17B, may also be targeted during this four-month period when the shallow water and proposed deepwater closure could overlap. Those species include greater amberjack, white grunt, yellowtail snapper, gray triggerfish, mutton snapper, blackfin snapper, cubera snapper, gray snapper, lane snapper, schoolmaster, and others. Effort shifts to harvest of these species may help mitigate, to some extent, the combined negative socioeconomic impacts of Amendment 16 and Amendment 17B. Furthermore, increased targeting of mackerel species could be expected during this time period.

On July 30, 2008, Snapper Grouper Amendment 15B was submitted for Secretarial review and the final rule published on November 16, 2009. Management measures in Amendment 15B that affect species addressed in Snapper Grouper Amendment 17B 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 (ACCSP) release, discard, and protected species module to assess and monitor bycatch; allocations for snowy grouper; and management reference points for golden tilefish.

Since some recreational fishermen may intentionally catch more fish than they can consume with the intent to sell, prohibiting the sale of those fish by recreational fishermen could decrease fishing effort, and therefore, may have biological benefits. Adopting a bycatch monitoring method would not yield immediate biological benefits, but may help to inform future fishery management decisions with increased certainty using data collected from the ACCSP. Biological benefits from Snapper Grouper Amendment 15B are not expected to result in a significant cumulative

biological effect when added to anticipated biological impacts under Snapper Grouper Amendment 17B.

In a letter dated 3/23/09, the South Atlantic Council requested a prohibition on harvest and possession of red snapper to be implemented through interim measures. The Council approved the following motion at the March 2009 meeting in Jekyll Island, Georgia: "Request an interim rule to implement no harvest of red snapper in the EEZ off NC, SC, GA & FL [intent to request an extension for a total of a one year closure and to request the states to adopt compatible regulations]." The interim rule became effective on January 4, 2010 and will remain in place until June 2, 2010. The Secretary of Commerce will determine whether to extend the interim rule while the Council is completing Snapper Grouper Amendment 17A to implement permanent regulations for red snapper.

C. Reasonably Foreseeable Future

Snapper Grouper Amendment 17A is currently under development and is expected to include a rebuilding plan and management measures that would end overfishing of red snapper. Amendment 17A would also specify an Annual Catch Limit (ACL) and Accountability Measures (AMs) for red snapper as required by the Magnuson-Stevens Act. One of several potential management measures being considered in Amendment 17A is a total prohibition on all fishing for red snapper as well as a large area closure for all snapper grouper fishing off the coasts of Georgia and Northern Florida. These closures, if implemented through rulemaking, would enhance the expected biological benefits of the spawning season closure for shallow water grouper in Snapper Grouper Amendment 16, and the proposed deepwater snapper grouper closure in Snapper Grouper Amendment 17B. It is possible that a snapper grouper closure proposed in Amendment 17A could overlap, to some degree, the deepwater closure proposed in Amendment 17B, and would therefore, enhance the biological benefit to red snapper and other deepwater species. Even greater biological benefit may accrue in the proposed Amendment 17A areas that would extend into the proposed 17B deepwater closure area (**Alternative 4 (Preferred)**) since no snapper grouper fishing would be allowed, rather than only prohibiting the harvest of deepwater species.

Snapper Grouper Amendment 18 is currently under development. Measures in Amendment 18 would extend the snapper grouper FMP northward, limit effort in the black sea bass and golden tilefish fisheries, change the golden tilefish fishing year, establish golden tilefish trip limits, improve the accuracy and timing of fisheries statistics, and designate EFH in the proposed snapper grouper northern area. The actions currently contained in Amendment 18, which affect the same species being addressed in Snapper Grouper Amendment 17B, are intended to prevent overcapitalization while allowing fishery participants to achieve optimum yield benefits for those species.

Snapper Grouper Amendment 20 is currently under development. Amendment 20 will include a formal review of the current wreckfish individual transferable quota (ITQ) program and will update/modify that program according to recommendations from the review. Amendment 20 will also update the wreckfish ITQ program to comply with Reauthorized Magnuson-Stevens Act LAPP requirements. Actions in Amendment 20 are not likely to impact species addressed in Snapper Grouper Amendment 17B. However, more restrictive quotas, ACLs, and associated management measures in Snapper Grouper Amendments 13C, 16, 15B, 17A, and 17B are likely to lead to some effort shift from directed snapper grouper fishing to wreckfish fishing.

Snapper Grouper Amendment 21 is currently under development and will examine trip limits; effort and participation reduction and endorsements; catch shares for the following quota species (except snowy grouper): vermilion snapper, golden tilefish, black sea bass, gag, greater amberjack, red grouper, and black grouper; individual transferable quotas (ITQs); cooperatives; regional fishery allocations (RFAs); community development quota (CDQ) components; regional or state by state quotas; and changes in the black sea bass fishing year.

Snapper Grouper Amendment 22 is currently under development and will address long-term management for red snapper.

The Comprehensive Annual Catch Limit (ACL) Amendment is currently under development and would establish Annual Catch Limits (ACLs), Accountability Measures (AMs), Annual Catch Targets (ACTs) for all other federally managed South Atlantic species not experiencing overfishing. Other actions contained within the ACL Amendment may include: (1) choosing ecosystem component species; (2) allocations; (3) management measures to limit recreational and commercial sectors to their ACTs; (4) accountability measures; and (5) any necessary modifications to the range of regulations. It is unlikely any of the management measures for the species being addressed in the Comprehensive ACL Amendment would directly affect the species included in Snapper Grouper Amendment 17B. However, several species are co-occurring, and species in Amendment 17B could be included in potential species groupings in the Comprehensive ACL Amendment (e.g., the shallow water snapper grouper complex and the deepwater snapper grouper complex). Therefore, if regulations are implemented in the future that may biologically benefit one species in a species complex, it is likely others in the same complex may also realize biological benefits.

Mackerel Amendment 18 is currently under development and would establish Annual Catch Limits (ACLs), Accountability Measures (AMs), Annual Catch Targets (ACTs) for king mackerel, Spanish mackerel, and cobia. A number of snapper grouper fishers also participate in the mackerel fishery.

Spiny Lobster Amendment 10 is currently under development and would establish Annual Catch Limits (ACLs), Accountability Measures (AMs), Annual Catch Targets (ACTs) for lobsters. A number of snapper grouper fishers also participate in the lobster fishery.

II. Non-Council and other non-fishery related actions, including natural events affecting speckled hind, warsaw grouper, golden tilefish, and snowy grouper.

A. Past
B. Present
C. Reasonably foreseeable future

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

The snapper grouper ecosystem includes many species, which occupy the same habitat at the same time.

<u>Climate change</u>
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).

Actions from this amendment could decrease the carbon footprint from fishing if some fishermen stop or reduce their number and duration of trips due to the proposed area closure. 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 timeframe known in which these impacts will occur. Actions in this amendment are expected to reduce harvest of snapper grouper species including speckled hind, warsaw grouper, golden tilefish, snowy grouper, black sea bass, vermilion snapper, black grouper, red grouper, gag, and co-occurring species; thus these actions may partially mitigate the negative impacts of global climate change on snapper grouper species.

AFFECTED ENVIRONMENT

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 Cumulative Effects Analysis (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 trends in condition of gag, vermilion snapper, black sea bass, snowy grouper, and golden tilefish are documented through the Southeast Data, Assessment and Review (SEDAR) process. Warsaw grouper and speckled hind have not been recently assessed. However, given the best available science, each of these stocks has been determined to be undergoing overfishing, meaning that fishing related mortality is greater than the maximum fishing mortality threshold. Red grouper and black grouper are currently being assessed through the SEDAR process, the results of which could be used to inform updates to fishery management decisions for these species in the near future. The status of each of these stocks is described in detail in **Section 3.3** of this document, and is hereby incorporated by reference.

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

The Cumulative Effects Analysis (CEA) should address whether thresholds could be exceeded because of the contribution of the proposed action to other cumulative activities affecting resources.

Fish populations

Definitions of overfishing and overfished for species addressed in this amendment can be found in the most recent stock assessment sources included in **Table 1-1** of this document. Applicable stock assessment sources include SEDAR 4 (2004) for golden tilefish and snowy grouper; Potts and Brennan (2001) for speckled hind, black grouper, and red grouper; Huntsman *et al.* (1993) for warsaw grouper; SEDAR Update 2 (2005) for black sea bass; SEDAR 10 (2006) for gag; and SEDAR 17 (2008) for vermilion snapper. Of these species, snowy grouper, and black sea bass have been declared overfished. All others have been determined to be undergoing overfishing according to their respective overfishing and overfished definitions. Detailed discussions of the science and processes used to determine the stock status of these species is contained in the previously mentioned information sources and are hereby incorporated by reference.

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 gag and snowy grouper, assessments reflect initial periods when the stocks were above B_{MSY} and fishing mortality was fairly low. However, some species such as vermilion snapper and black sea bass 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.

DETERMINING THE ENVIRONMENTAL CONSEQUENCES OF CUMULATIVE EFFECTS

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

Table 4-26. 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
1960s-1983	Growth overfishing of many reef fish species.	Declines in mean size and weight of many species including black sea bass.
August 1983	4" trawl mesh size to achieve a 12" TL commercial vermilion snapper minimum size limit (SAFMC 1983).	Protected youngest spawning age classes.
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 1988b).	Increase yield per recruit of vermilion snapper; eliminate trawl damage to live bottom habitat.
Pre-January 1, 1992	Overfishing of many reef species including vermilion snapper and gag.	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).	Protected smaller spawning age classes of vermilion snapper.
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	Initiated the recovery of snapper grouper

Time period/dates	Cause	Observed and/or Expected Effects
	and retention of snapper grouper species (HAPC renamed OECA; SAFMC 1993).	species in OECA.
1992-1999	Declining trends in biomass and overfishing continue for a number of snapper grouper species including vermilion snapper and gag.	Spawning potential ratio for vermilion snapper and gag is less than 30% indicating that they are overfished.
February 24, 1999	Gag and black: 24" total length (recreational and commercial); 2 gag or black grouper bag limit within 5 grouper aggregate; March-April commercial closure. Vermilion snapper: 11" total length (recreational). Aggregate bag limit of no more than 20 fish/person/day for all snapper grouper species without a bag limit (SAFMC 1998b).	Fishing mortality (F) for gag and vermilion snapper declines but is still above F_{MSY}.
October 23, 2006	Snapper grouper FMP Amendment 13C (SAFMC 2006).	Commercial vermilion snapper quota set at 1.1 million lbs 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 December 16, 2009, and February 15, 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	Snapper grouper FMP	Protect spawning aggregations and snapper

Time period/dates	Cause	Observed and/or Expected Effects
29, 2009	Amendment 16 (SAFMC 2008c)	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.
January 4, 2010	Interim Rule for Red Snapper	Prohibit all fishing for, harvest, and possession of red snapper.
Target 2010	Snapper Grouper FMP Amendment 17A	SFA parameters for red snapper: ACL and management measures to limit recreational and commercial sectors to the ACL; and accountability measures.
Target 2010	Snapper Grouper FMP Amendment 17B	For overfishing species other than red snapper: SFA parameters; ACLs and ACTs; management measures to limit recreational and commercial sectors to their ACTs; and accountability measures.
Target 2010	Snapper Grouper FMP Amendment 18	Extend the snapper grouper FMU northward, prevent overexploitation in the black sea bass and golden tilefish fisheries, improve data collection timeliness and data quality.
Target 2011	Snapper Grouper FMP Amendment 17A	For red snapper: SFA parameters; ACLs; AMs; management measures to limit mortality to the ACL; and monitoring measures.
Target 2011	Snapper Grouper FMP Amendment 20	Review and update wreckfish ITQ program to comply with Reauthorized Magnuson-Stevens Act LAPP requirements.
Target 2011	Comprehensive ACL Amendment.	ACLs, ACTs, and accountability measures 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 2011	Mackerel Amendment 20	SFA parameters for mackerels and cobia: ACL and management measures to limit recreational and commercial sectors to the ACL; and accountability measures.
Target 2011	Spiny Lobster Amendment 10	SFA parameters for lobsters: ACL and management measures to limit recreational and commercial sectors to the ACL; and accountability measures.
Target 2012	Snapper Grouper FMP Amendment 21	Trip limits; effort and participation reduction and endorsements; catch shares for the following quota species (except snowy grouper): vermilion snapper, golden tilefish, black sea bass, gag, greater amberjack, red

Time period/dates	Cause	Observed and/or Expected Effects
		grouper, and black grouper; individual transferable quotas (ITQs); cooperatives; regional fishery allocations (RFAs); community development quota (CDQ) components; regional or state by state quotas; and changes in the black sea bass fishing year.
Target 2012	Snapper Grouper FMP Amendment 22	Long-term management for red snapper.

9. Determine the magnitude and significance of cumulative effects.

Proposed management actions, as summarized in **Section 2** of this document, would establish ACLs and AMs for those species undergoing overfishing and are expected to have a beneficial, cumulative effect on the biophysical environment. These management actions are expected to protect and increase stock biomass, which may affect other stocks. Detailed discussions of the magnitude and significance of the preferred alternatives appear in **Section 4** of this integrated document and is hereby incorporated by reference. Below is a short summary of the biological significance and magnitude of each of the preferred alternatives chosen, and a brief discussion of their combined effect on the snapper grouper FMU and the ecosystem.

Closing the area beyond 240 feet to deepwater snapper grouper fishing would provide protection to the largest, most fecund fish, and ensure a natural sex ratio into the future. Speckled hind are thought to form spawning aggregations, which can be susceptible to targeted fishing pressure (G. Gilmore, Dynamac Corporation, personal communication). Prohibiting all harvest of deepwater snapper grouper species beyond 240 feet would also protect these spawning aggregations, as well as decrease bycatch mortality of speckled hind, warsaw grouper, and other co-occurring deepwater snapper grouper species.

Snapper Grouper Amendment 13C took actions to immediately end overfishing of golden tilefish by establishing a 295,000 lb gw commercial quota at $F_{MSY.}$ In order to comply with the NS 1 guidelines, the Council chose to set a single ACL for golden tilefish at 75% of F_{MSY} for the commercial and recreational sectors. Setting the ACL lower than the Amendment 13C commercial quota will establish a larger buffer between the ACL and OFL, decreasing the risk of the ACL being exceeded and the AM being triggered. Therefore, this action is expected to be biologically beneficial in the long-term as it will help achieve and maintain a sustainable biomass level.

Reducing the bag limit for snowy grouper to 1 fish per vessel per day would benefit the environment in the short-term and long-term by limiting the extent to which the stock is targeted. Since release mortality of snowy grouper is considered to range from 90-100%, the lower bag limit would provide little reduction in fishing related mortality if fishermen continued to target the species. Therefore, the key to reducing fishing mortality of snowy grouper in the recreational sector is to remove the incentive to target the species, which is

the Councils intent under this action. Additionally, using an average of landings over a period of years to monitor the recreational ACL and implement AMs would provide a small benefit to the biological environment since ACL overages in the recreational sector would be accounted for on a yearly basis.

Establishing ACLs and AMs for black grouper, red grouper, black sea bass, gag, and vermilion snapper would provide protection for these species and implement a mechanism by which ACL overages could be accounted for and recovered in subsequent years. Since SEDAR assessments are forthcoming for red grouper and black grouper, the ability to adjust their ACLs and AMs according to the outcome of those assessments has been built into the proposed modifications to the current framework procedures. In doing so, the biological benefits of setting ACLs and AMs may be optimized through timely and efficient framework actions rather than time intensive FMP amendments. Every stock in the snapper grouper FMU would be able to have their ACLs, ACTs, and AMs adjusted as new stock assessments/updates are completed.

When viewed in totality, the actions in this amendment would benefit the species currently undergoing overfishing as well as the ecosystem in which they reside. Since the snapper grouper FMU and species complexes therein include a host of co-occurring species, proposed management measures may also benefit those associated species in addition to the nine addressed here. Predator prey relationships would likely approach balanced conditions over time, and the protections put in place under this amendment may enhance the natural sex ratio and protect easily targeted fish that may aggregate to spawn. Although it is difficult to quantify the cumulative effects of the proposed actions, it is expected that the effects will be positive and synergistic.

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

The cumulative effects on the biophysical environment are expected to be positive. 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.

Methods to monitor the progress of rebuilding efforts may be highly variable. Large scale research entities such as MARMAP and SEFSC research cruises may gather fishery-independent data while cooperative research programs with academic institutions and headboat surveys could be used to supplement fishery-dependant data along with the MRIP reporting system. Dependent upon funding, more monitoring efforts may be implemented in the future with special emphasis on large closed areas such as the proposed deepwater snapper grouper closure in this amendment (see Section 4.14 and **Appendix G** for more detail).

4.7.2 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 **Section 3.0** and incorporated herein by reference. A description of the history of management of the snapper grouper fishery is contained in **Section 1.3** and is incorporated herein by reference. Participation in and the economic performance of the fishery have been effected 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. For each regulatory action, expected effects are projected. However, these projections typically only minimally, if at all, are capable of incorporating the variety of external factors, and evaluation in hindsight is similarly incapable of isolating regulatory effects from other factors, as in, what portion of a change was due to the regulation versus due to input cost changes, random variability of species availability, the sale of a fish house or docking space for condominium development, or even simply fishermen behavioral changes unrelated to the regulation.

In general, it can be stated, however, that the regulatory environment for all fisheries has become progressively more complex and burdensome, increasing, in tandem with other adverse influences, the likelihood of economic losses, business failure, occupational changes, and associated adverse pressures on associated families, communities, and industries. Some reverse of this trend is possible and expected. The establishment of ACLs and AMs for species undergoing overfishing is expected to help protect and sustain harvest at the OY level. However, certain pressures would remain, such as total effort and total harvest considerations, increasing input costs, import induced price pressure, and competition for coastal access.

A detailed description of the expected social and economic impacts of the actions in this amendment are contained elsewhere in **Section 4**, and in **Sections 5, 6** and **7**, which are incorporated herein by reference. Current and future amendments are expected to add to this cumulative effect. Snapper Grouper Amendment 15B prohibited the sale of bag-

limit caught snapper grouper species for those who do not hold a federal commercial permit for snapper grouper. This would eliminate 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 would have more pronounced effects on the for-hire sector which often uses the sale of bag-limit caught fish to pay crew members. The cumulative impacts of eliminating the ability to sell bag limit caught snapper grouper and the restrictions in this amendment could be perceived as being significant to this sector.

Snapper Grouper Amendment 16 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 are intended to prevent the stocks from becoming overfished, which would require recovery plans, further harvest restrictions, and additional social and economic losses.

Snapper Grouper Amendment 17A will address the overfished status of red snapper. Because of red snapper bycatch in other snapper grouper fisheries, red snapper rebuilding requires not only closure of the red snapper fishery for a protracted period of time, but also closure of other snapper grouper fisheries in certain areas. While 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. Thus, closure of the red snapper fishery alone may have substantive social and economic effects on some businesses and communities. Closure of additional snapper grouper fisheries to reduce red snapper bycatch in order to achieve red snapper rebuilding goals is expected to have additional and broader adverse short-term social and economic effects.

Snapper Grouper Amendment 18 will examine limiting participation and effort in the golden tilefish and black sea bass pot fisheries, consider extending the range of the FMP north through the Mid-Atlantic and New England Council areas, and identify EFH and EFH-HAPCs, among other actions. While restrictions of this nature would in theory allow status quo total harvests for the respective species to continue, these restrictions may result in the redistribution of harvests among traditional users, resulting in those who are able to increase their harvests, and associated social and economic benefits, and those who suffer reduced harvests, with associated losses in benefits. For those who would be expected to experience a possible reduction in harvests, these reductions may occur on top of declining benefits as a result of other recent or developing management action.

Cumulative economic impacts of Amendment 17B specific to the commercial fishery:

Previous sections compared the effects of proposed alternatives within each Action by assuming the No-Action alternative for other Actions. This section compares the joint effects of the Council's preferred alternatives for all Actions with the No-Action alternative for Amendment 17B. The preferred alternatives included **Alternative 4 (Preferred)** for speckled hind and warsaw grouper, **Alternative 3 (Preferred)** for golden tilefish allocation, **Alternative 2 (Preferred)** for golden tilefish total allowable catch,

and **Alternative 2b (Preferred)** for gag, red grouper, and black grouper ACL. The respective status quo alternatives include the simulated effects on the commercial fishery of Amendments 13C and 16.

An important characteristic of the commercial snapper grouper fishery is that fishermen usually catch more than one species on the same trip. If two or more proposed regulations affect different species that generally are landed on the same trips, then it is possible that their joint effects could differ from the sum of the effects for each regulation considered separately.

This is not the case for Snapper Grouper Amendment 17B, which considers additional management for three relatively distinct portions of the snapper-grouper fishery. The proposed management alternatives for speckled hind and warsaw grouper primarily would affect deepwater species and have little effect on trips that land shallow water groupers or tilefish. The proposed alternatives for red grouper and black grouper primarily would affect trips with shallow water groupers and have little effect on trips that land deep water species or tilefish. Similarly, the proposed alternatives for golden tilefish primarily would affect trips for golden tilefish and have little effect on trips that land shallow water groupers or the deep water species. As a result, the effect of the preferred alternatives when evaluated simultaneously is approximately equal to the sum of the effects of each preferred alternative when evaluated separately.

Average annual net operating revenues to boat owners and crew after deducting trip costs would decline from $8.78 million in constant 2008 dollars to approximately $8.38 million with the preferred management alternatives for speckled hind, warsaw grouper, golden tilefish, gag, red grouper, and black grouper. The average annual difference of -$0.40 million between the Status Quo and Preferred management scenarios represents a 4.6% average annual short-term economic loss that would be incurred by the commercial snapper-grouper fishery. Actual losses would vary annually depending on economic, biological and environmental conditions. For example, the expected losses of $0.80 million (an 8.2% loss compared to Status Quo) with fishing conditions as characterized in 2008 would be approximately twice the average annual loss of $0.40 million, whereas the predicted losses of approximately $0.15 million (a 1.9% loss compared to Status Quo) with fishing conditions as characterized in 2005 would be approximately half the average (Figures 4-15a and 4-15b).

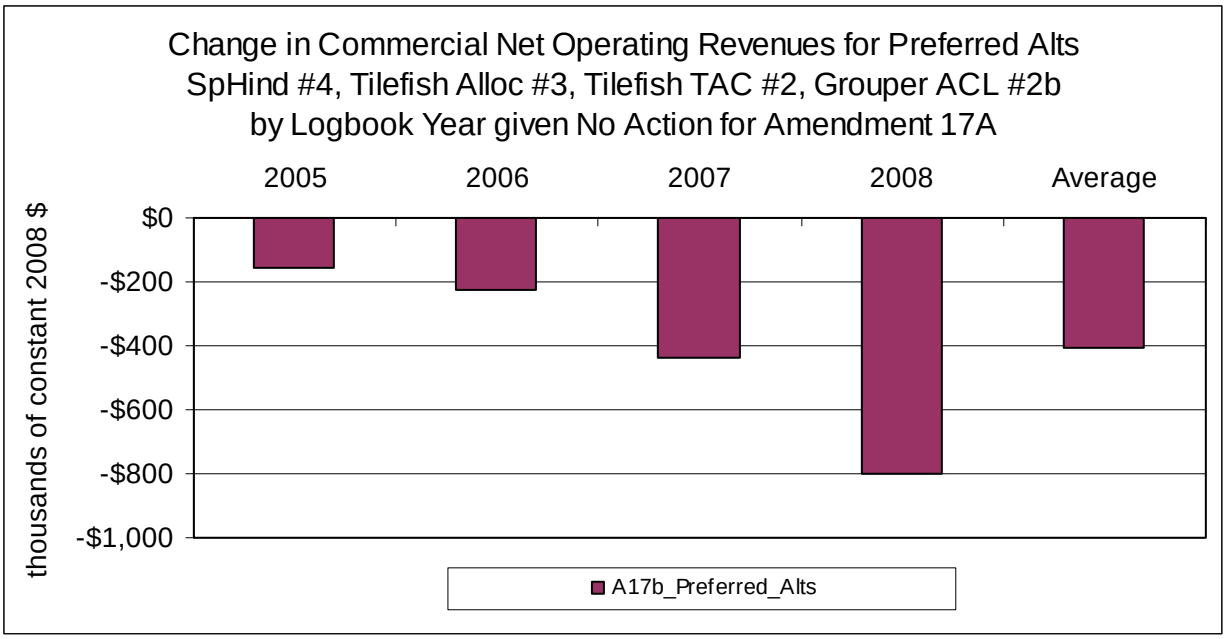


Figure 4-15a. Predicted change in commercial net operating revenues by year for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

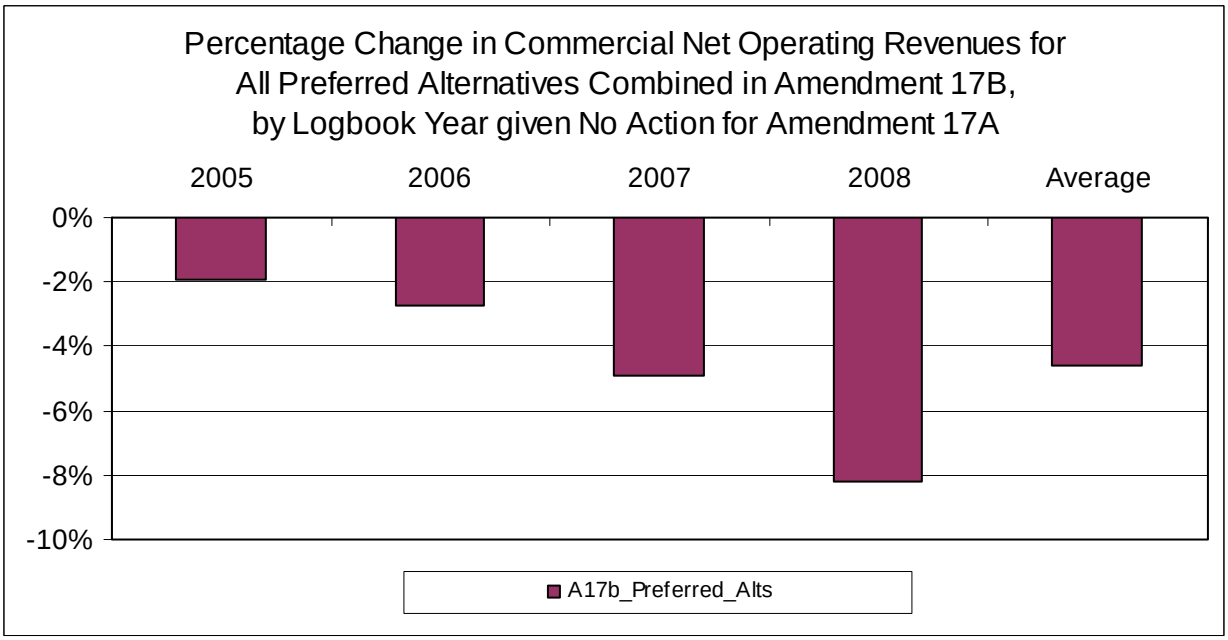


Figure 4-15b. Predicted percentage change in commercial net operating revenues by year for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

The expected economic losses differ by gear. Most of the losses in dollars would be incurred by boats on trips with vertical line gear because that is the predominant gear in

the fishery. Fishermen on trips with longlines represent a smaller component of the snapper-grouper fishery, but would incur greater percentage losses because the prohibition on the harvest of deep water species in waters deeper than 240 feet would eliminate most of the longline fishery for snowy grouper and yellowedge grouper. Fishermen on trips with vertical line gear are expected to lose an annual average of slightly more than $320,000 per year in constant 2008 dollars, or about 4.6% compared to No Action, while fishermen on trips with bottom longlines are expected to lose an average of $68,000 per year, or about 13.2% compared to their earnings with the Status Quo (Figures 4-16a and 4-16b).

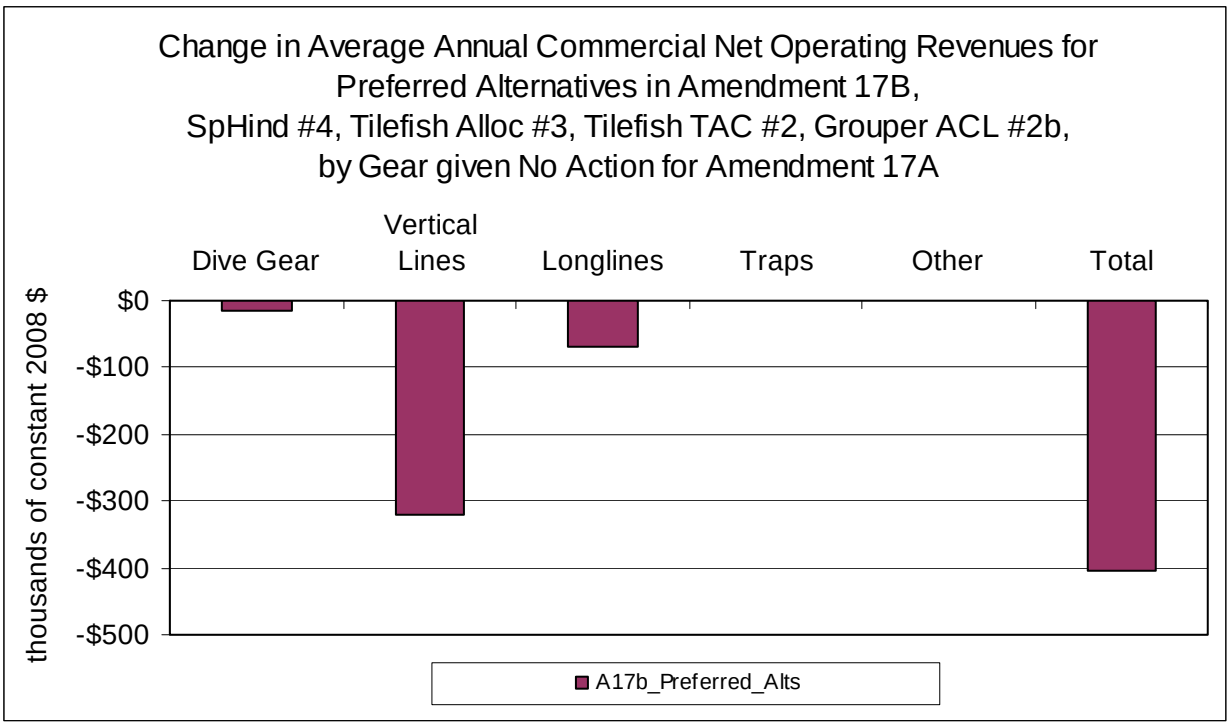


Figure 4-16a. Predicted change in commercial net operating revenues by gear for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

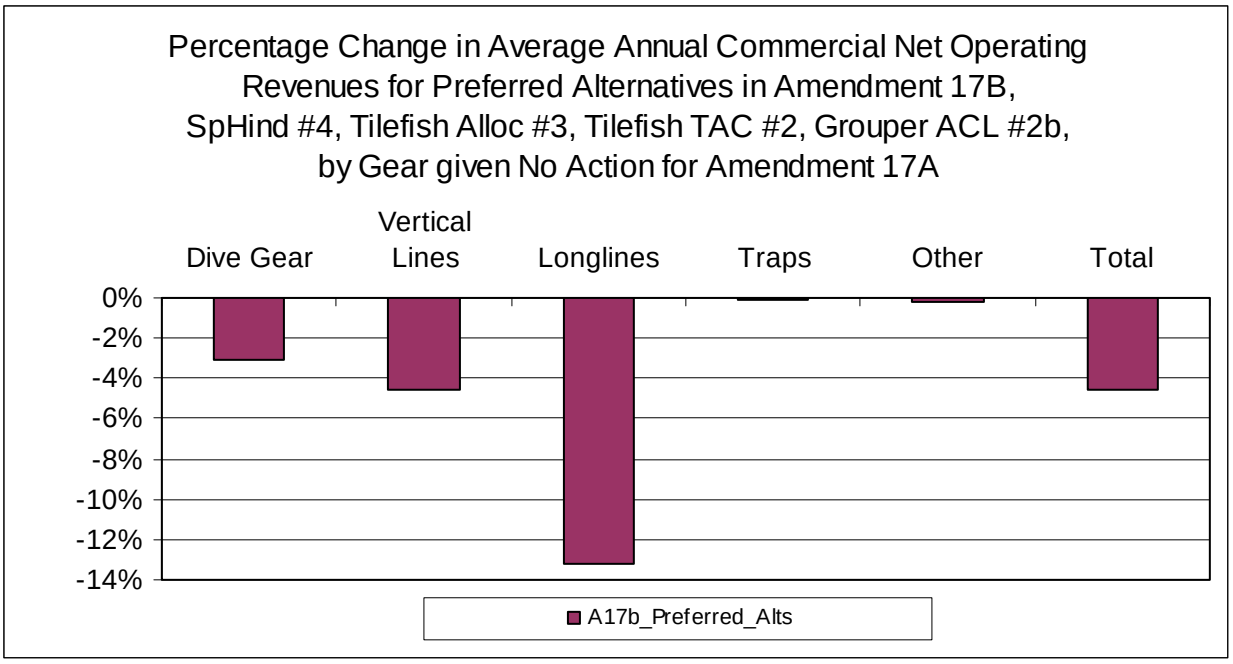


Figure 4-16b. Predicted percentage change in commercial net operating revenues by gear for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

The economic effects of Snapper Grouper Amendment 17B also are expected to differ by state of landing. Fishermen from North Carolina, South Carolina, and the Florida Keys would incur the greatest losses in terms of both dollars and percentages, whereas fishermen from Georgia through southeast Florida would be affected to a lesser extent (Figures 4-17a and 4-17b). The geographic distribution of expected reductions in net operating revenues primarily reflects the location of fishing activities for the species whose harvest would be prohibited in waters deeper than 240 feet.

Most vessels would not be affected by the preferred alternatives. The logbook database includes trip reports for 776 vessels in 2005, 765 vessels in 2006, 760 vessels in 2007, and 791 vessels in 2008. Over the 4-year period, approximately 77.3% of vessels would not be affected by the preferred alternatives in Snapper Grouper Amendment 17B. Approximately 13.5% would be expected to incur losses of less than $1,000 per vessel. Another 6.3% would be expected to incur losses between $1,000 and $5,000 per vessel, and 2.2% would be expected to incur losses of more than $5,000. Approximately 0.7% would be expected to realize a gain in net operating revenues. Based on logbook data for 2005-2008, the maximum loss per vessel would be approximately $131,000 given conditions in 2008, and the maximum gain per vessel would be approximately $3,000 given conditions in 2006.

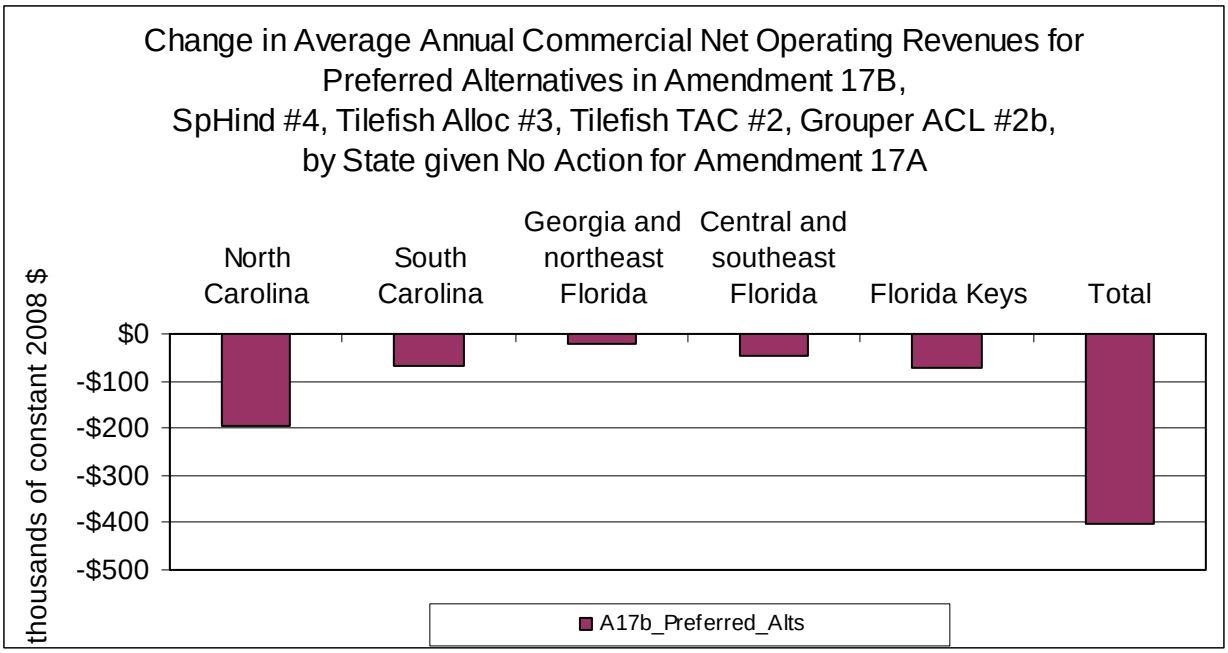


Figure 4-17a. Predicted change in commercial net operating revenues by state of landing for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

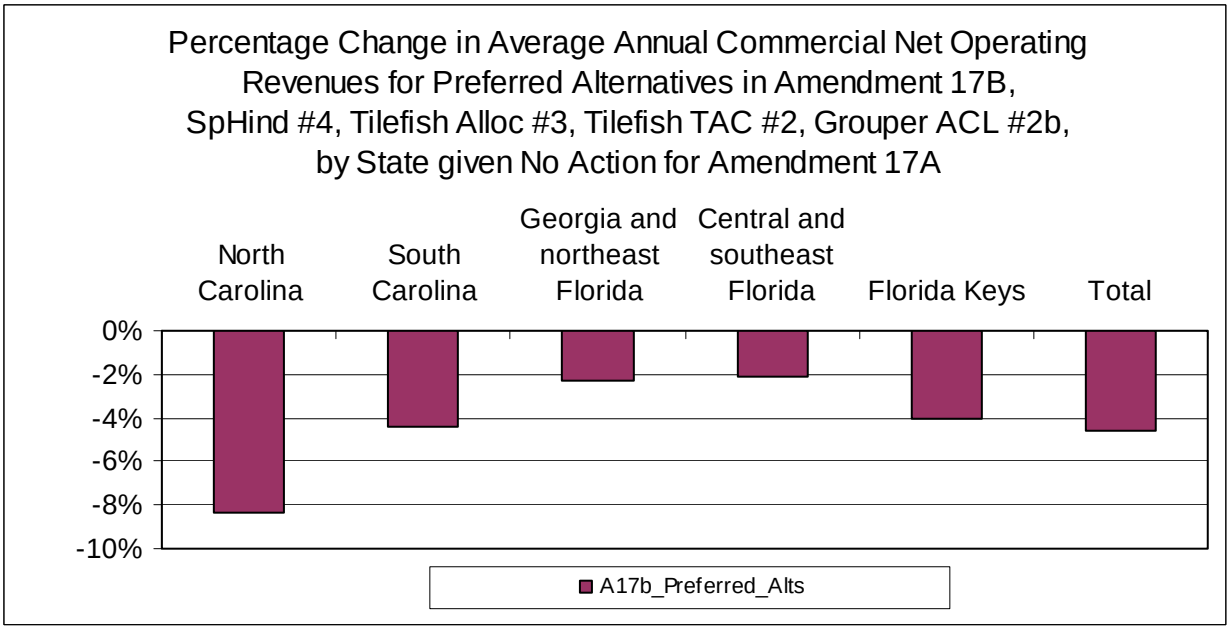


Figure 4-17b. Predicted percentage change in commercial net operating revenues by state of landing for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

The simulation results suggest that most of the proposed management alternatives that were evaluated would not have major *additional* economic effects when compared to the no-action alternative for the entire commercial snapper-grouper fishery, *after accounting for the expected effects of Snapper Grouper Amendments 13C and 16*. This is because Snapper Grouper Amendment 17B would not impose additional regulations for the commercial harvest of high-volume species such as vermilion snapper, yellowtail snapper, and gag.

Average annual net operating revenues to boat owners and crew after deducting trip costs would decline from $8.78 million in constant 2008 dollars to approximately $8.38 million with the preferred management alternatives for speckled hind, warsaw grouper, golden tilefish, gag, red grouper, and black grouper. The average annual difference of -$0.40 million between the No Action and Preferred management scenarios represents a 4.6% average annual short-term economic loss that would be incurred by the commercial snapper-grouper fishery. On average, approximately 72% of the overall, expected annual reduction in net operating revenues would occur in response to the prohibition on the harvest and landing of deep water groupers and snappers and blueline tilefish in waters deeper than 240 feet. Approximately 26% of the expected annual reduction would occur in response to the aggregate ACL for gag, red grouper, and black grouper, and the remaining 2% reduction is expected in response to a lower ACL for tilefish.

The analysis evaluated the economic effects of proposed alternatives for each management action given the No-Action alternative for other actions, as well as the simultaneous effects of all preferred alternatives for the various actions in Snapper Grouper Amendment 17B. In addition, the management alternatives in Amendment 17B could interact with additional alternatives that are simultaneously being developed in Snapper Grouper Amendment 17A to manage fishing activity in areas with large concentrations of red snapper.

4.8 Bycatch Practicability

4.8.1 Population Effects for the Bycatch Species

4.8.1.1 Background

The directed commercial fishery for vermilion snapper, gag, red snapper, misty grouper, silk snapper, red grouper, queen snapper, snowy grouper, black grouper, and blueline tilefish is prosecuted primarily with hook and line gear (Table 4-27). Black sea bass are predominantly taken with pots; whereas, longline gear has been the predominant gear type used to capture golden tilefish, yellowedge grouper, speckled hind, and warsaw grouper. Commercial landings information for speckled hind and warsaw grouper are probably not reliable since sale is prohibited for these species.

Table 4-27. Percentage of commercial catch by gear based on data from 2005-2008.

Species	H&L	Diving	LL	Pot	Other
Gag	94.85%	3.62%	1.31%	0.02%	0.20%
Black sea bass	11.07%	0.01%	0.01%	88.81%	0.10%
Vermilion snapper	99.75%	0.05%	0.05%	0.10%	0.05%
Red grouper	76.53%	1.30%	21.75%	0.20%	0.23%
Black grouper	71.70%	10.17%	17.07%	0.17%	0.89%
Golden tilefish	10.03%	0.00%	89.61%	0.00%	0.35%
Snowy grouper	73.55%	0.00%	26.25%	0.01%	0.19%
Red Snapper	92.56%	5.95%	0.58%	0.01%	0.91%
Speckled Hind	27.09%	0.08%	72.54%	0.29%	0.01%
Warsaw grouper	33.28%	0.00%	66.72%	0.00%	0.00%
Blueline tilefish	56.09%	0.03%	41.74%	1.76%	0.37%
Yellowedge grouper	17.90%	0.05%	82.05%	0.00%	0.01%
Misty grouper	88.25%	0.87%	10.88%	0.00%	0.00%
Queen Snapper	75.75%	1.15%	23.07%	0.00%	0.03%
Silk Snapper	86.76%	0.02%	13.19%	0.01%	0.02%

Source: NMFS SEFSC Logbook program.
Note. All of Monroe County is represented for commercial landings.

Landings during 2005-2008 were predominantly from the commercial sector for vermilion snapper, gag, golden tilefish, snowy grouper, black grouper, speckled hind, yellowedge grouper, misty grouper, queen snapper, and silk snapper. The recreational sector dominated landings for red snapper, red grouper, blueline tilefish, black sea bass, and warsaw grouper (Table 4-28).

Table 4-28. Average landings (lbs whole weight) during 2005-2008 for commercial (ALS), headboat (HB), MRFSS, and HB MRFSS combined.

Species	commercial	HB	MRFSS	HB/MRFSS
Gag	634,628	63,470	375,349	438,819
Black sea bass	453,254	153,774	647,776	801,550
Vermilion snapper	1,050,800	407,322	321,564	728,886
Red grouper	508,490	64,382	539,640	604,022
Black grouper	155,104	14,988	41,789	41,789
Golden tilefish	370,095	0	72,271	72,271
Snowy grouper	193,962	671	60,113	60,784
Red Snapper	143,029	93,894	539,640	633,534
Speckled Hind	15,765	1,207	1,753	2,960
Warsaw grouper	2,267	1,034	10,206	11,240
Blueline tilefish	207,169	513	268,279	268,792
Yellowedge grouper	52,063	30	428	458
Misty grouper	1,697	1	0	1
Queen snapper	6,444	0	352	352
Silk snapper	24,207	2,131	661	2,792

Note. All of Monroe County is represented for commercial landings.

Regulations, which are currently being used to manage the species included in Snapper Grouper Amendment 17B are: quotas (gag, vermilion snapper, golden tilefish, snowy grouper, and black sea bass); size limits (vermilion snapper, gag, red grouper, black grouper, red snapper, queen snapper, and black sea bass); bag limits (all 15 species mentioned in Table 4-28); and closed seasons (gag, vermilion snapper, black grouper, and red grouper).

Management measures proposed in Snapper Grouper Amendment 17B would establish ACLs and AMs for some species undergoing overfishing, modify management measures to reduce harvest to achieve ACLs and ACTs, establish allocations for golden tilefish, and update framework procedures. These alternatives are described in detail in Sections 2.0 and 4.0. The final National Standard 1 (NS1) guidelines recognize that existing FMPs may use terms and values that are similar to, associated with, or may be equivalent to ABC, ACL, ACT, and AM in many fisheries for which annual specifications are set for different stocks or stock complexes. In these situations the guidelines suggest that, as Councils revise their FMPs, they use the same terms as set forth in the NS1 guidelines.

Management measures specified in Snapper Grouper Amendment 16, which has been implemented, include actions that could serve as ABCs, ACLs, ACTs, and AMs for species addressed in Snapper Grouper Amendment 17B. Amendment 16 established sector allocations for gag and vermilion snapper, a commercial quota for gag, and reduced the commercial quota for vermilion snapper; prohibited harvest and retention of gag and shallow water groupers (gag, black grouper, red grouper, scamp, red hind, rock hind, coney, graysby, yellowfin grouper, yellowmouth grouper, and tiger grouper) after the commercial gag quota is projected to be met; established a January through April recreational and commercial spawning season closure for gag and other shallow water

groupers including red grouper and black grouper; modified bag limits for vermilion snapper, gag, and shallow water groupers; established a recreational closed season for vermilion snapper; and excluded captain and crew on for-hire vessels from retaining vermilion snapper or species in the grouper aggregate.

4.8.1.2 Commercial Fishery

During 2004 to 2008, approximately 20% of snapper grouper permitted vessels from the Gulf of Mexico and South Atlantic were randomly selected to fill out supplementary logbooks. The average number of trips per year during 2005 to 2008 was 14,005 (Table 4-29). Fishermen spent an average of 1.69 days at sea per trip.

Table 4-29. Snapper grouper fishery effort for South Atlantic.

Year	Trips	Days	Days per Trip
2005	13,783	22,876	1.66
2006	13,273	23,335	1.76
2007	14,835	24,446	1.65
2008	14,127	23,898	1.69
Mean	14,005	23,639	1.69

Source: NMFS SEFSC Logbook Program.

For species in Snapper Grouper Amendment 17B, the number of trips that reported discards was greatest for vermilion snapper, red grouper, and gag, followed by black sea bass, and black grouper (Table 4-30). The average percentage of trips that reported discards was 5.35% for vermilion snapper, 3.52% for red grouper, 2.71% for black grouper, 2.67% for black sea bass, and 2.59% for gag (Table 4-31). During 2005-2008, the average number of individuals discarded per trip was greatest for vermilion snapper (63), followed by black sea bass (Table 4-32).

Since the discard logbook database represents a sample, data were expanded to estimate the number of discarded fish in the whole fishery. The method for expansion was to: (1) estimate the probability of discarding a species; (2) estimate the number of fish discarded per trip; and (3) estimate the number discarded in the whole fishery (total discarded = total trips * % trips discarding * discard number). For example in 2008, the total discards of red grouper 1,493 = 14,127 total trips (Table 4-29) * 0.023 trips discarding (Table 4-31) * 4.4 discards/trip (Table (Table 4-32). During 2005-2008, an average of 52,160 vermilion snapper, 20,731 black sea bass, 2,775 red grouper, 2,471 gag, and 1,934 black grouper were discarded per year (Table 4-33).

Table 4-30. Annual number of trips reporting discards of Snapper Grouper Amendment 17B species.

Year	Red grouper	Black grouper	Vermilion snapper	Gag	Golden tilefish	Speckled hind	Warsaw grouper	Snowy grouper	Black sea bass	Blueline tilefish	Yellowedge grouper	Misty grouper	Queen snapper	Silk snapper
2005	118	115	78	64	0	38	1	8	54	2	3	0	0	1
2006	74	44	96	23	0	13	0	1	54	0	0	0	0	0
2007	143	82	158	88	1	6	1	10	55	1	0	0	2	1
2008	110	96	472	221	1	42	3	29	215	0	0	0	0	0
Mean	111.3	84.3	201.0	99.0	0.5	24.8	1.3	12.0	94.5	0.8	0.8	0.0	0.5	0.5

Source: NMFS SEFSC Logbook Program.

Table 4-31. Percentage of trips that discarded Snapper Grouper Amendment 17B species.

Year	Red grouper	Black grouper	Vermilion snapper	Gag	Golden tilefish	Speckled hind	Warsaw grouper	Snowy grouper	Black sea bass	Blueline tilefish	Yellowedge grouper	Misty grouper	Queen snapper	Silk snapper
2005	5.00	4.87	3.31	2.71	0.00	1.61	0.04	0.34	2.29	0.08	0.13	0.00	0.00	0.04
2006	3.78	2.25	4.91	1.18	0.00	0.66	0.00	0.05	2.76	0.00	0.00	0.00	0.00	0.00
2007	2.99	1.72	3.31	1.84	0.02	0.13	0.02	0.21	1.15	0.02	0.00	0.00	0.04	0.02
2008	2.30	2.01	9.88	4.62	0.01	0.88	0.06	0.61	4.50	0.00	0.10	0.00	0.00	0.00
Mean	3.52	2.71	5.35	2.59	0.01	0.82	0.03	0.30	2.67	0.03	0.06	0.00	0.01	0.02

Source: NMFS SEFSC Logbook Program.

Table 4-32. Unexpanded umber of discarded Snapper Grouper Amendment 17B species.

Year	Red grouper	Black grouper	Vermilion snapper	Gag	Golden tilefish	Speckled hind	Warsaw grouper	Snowy grouper	Black sea bass	Blueline tilefish	Yellowedge grouper	Misty grouper	Queen snapper	Silk snapper
2005	4.9	6.6	62.9	6.1	0.0	5.3	2.0	3.8	21.4	1.0	3.0	0.0	0.0	5.0
2006	7.1	4.6	45.5	2.9	0.0	8.2	0.0	1.0	21.6	0.0	0.0	0.0	0.0	0.0
2007	6.0	3.0	62.8	4.8	2.0	3.3	1.0	2.2	57.0	3.0	0.0	0.0	1.0	1.0
2008	4.4	3.8	81.6	8.5	2.0	8.3	4.3	6.9	87.7	0.0	0.0	0.0	0.0	0.0
Mean	5.6	4.5	63.2	5.6	1.0	6.3	1.8	3.5	46.9	1.0	0.8	0.0	0.3	1.5

Source: NMFS SEFSC Logbook Program.

Table 4-33. Expanded number of discarded Snapper Grouper Amendment 17B species.

Year	Red grouper	Black grouper	Vermilion snapper	Gag	Golden tilefish	Speckled hind	Warsaw grouper	Snowy grouper	Black sea bass	Blueline tilefish	Yellowedge grouper	Misty grouper	Queen snapper	Silk snapper
2005	3,389	4,458	28,647	2,290	0	1,180	12	175	6,760	12	53	0	0	29
2006	3,540	1,377	29,646	448	0	726	0	7	7,929	0	0	0	0	0
2007	2,676	767	30,778	1,301	6	62	3	68	9,725	9	0	0	6	3
2008	1,493	1,136	119,568	5,845	3	1,080	40	624	58,511	0	0	0	0	0
Mean	2,775	1,934	52,160	2,471	2	762	14	219	20,731	5	13	0	2	8

Source: NMFS SEFSC Logbook Program.

During 2005-2008, vermilion snapper and black sea bass were among the top ten most commonly discarded species in South Atlantic waters (Table 4-34).

Table 4-34. The 65 most commonly discarded species during 2005-2008 for the South Atlantic.

Species	Number of trips reported discarding the species	Number discarded
RED PORGY	1,027	106,888
SNAPPER, VERMILION	831	58,956
SHARK, UNC	383	26,882
BLACK SEA BASS	394	24,682
SNAPPER,YELLOWTAIL	1,539	15,764
SHARK, DOGFISH, SPINY	63	12,870
SCAMP	706	6,793
SNAPPER, RED	298	6,068
KING MACKEREL	1,052	5,688
SNAPPER, GRAY	273	4,730
TUNA, LITTLE (TUNNY)	121	4,092
MENHADEN	46	3,400
SHARK, DOGFISH, UNC	52	3,397
SHARK, ATLANTIC SHARPNOSE	151	3,304
PINFISH, SPOTTAIL	96	3,203
GROUPER, GAG	404	2,820
BLUEFISH	62	2,582
GROUPER, RED	451	2,466
SCUPS OR PORGIES,UNC	54	2,154
SHARK, DOGFISH, SMOOTH	31	2,136
GRUNTS	135	2,092
SHARK, BLACKTIP	155	2,080
BLUE RUNNER	232	1,776
AMBERJACK, GREATER	235	1,736
SHARK, SANDBAR	114	1,715
GRAY TRIGGER FISH	129	1,597
GROUPER, BLACK	340	1,592
SHARK, TIGER	110	1,492
GRUNT, TOMTATE	15	1,323
GRUNT, WHITE	83	1,188
SNAPPER, MUTTON	191	897
DOLPHINFISH	157	786
AMBERJACK	156	776
BONITO, ATLANTIC	154	762
REMORA	227	731
HIND, SPECKLED	101	688
BARRACUDA	55	626
BALLYHOO	18	600
SNAPPERS, UNC	21	506

Species	Number of trips reported discarding the species	Number discarded
FINFISHES, UNC FOR FOOD	68	478
TRIGGERFISHES	79	470
SNAPPER, LANE	53	385
GROUPERS	52	365
SPANISH MACKEREL	78	345
SHARK, CARIBBEAN SHARPNOSE	8	334
RAYS, UNC	44	320
STINGRAYS	28	305
NEEDLEFISH, ATLANTIC	71	297
CERO	95	285
CHUBS	6	263
GROUPER, SNOWY	49	255
TILEFISH, SAND	33	232
AMBERJACK, LESSER	7	204
COBIA	116	197
SHARK, NURSE	67	182
SHARK, SPINNER	26	167
MARGATE	12	166
SHARK, HAMMERHEAD	49	157
SNAPPER, MAHOGONY	13	133
RUDDERFISH (SEA CHUBS)	28	129
TUNA, YELLOWFIN	24	114
HAKE, ATLANTIC ,RED & WHITE	19	105
JACK, ALMACO	13	104
SPADEFISH	19	102
SKATES	17	97

Source: NMFS SEFSC Logbook Program.

4.8.1.3 Recreational Fishery

For the recreational fishery, estimates of the number of recreational discards are available from 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.

For species in Snapper Grouper Amendment 17B, the number of released fish was greatest for black sea bass (12,155,946), followed by vermilion snapper (782,111), gag (631,667), and red grouper (363,155) (Table 4-35). During 2005-2008, 86% black grouper, 85% speckled hind, 84% red snapper, 82% black sea bass, 79% gag, and 61% red grouper were released by recreational fishermen (Table 4-35).

Table 4-35. Estimated number total catch (A+B1+B2), harvests (A+B1), and released (B2) fish in numbers for the South Atlantic during 2005-2008.

Species	Total	A+B1	B2	% B2
Vermilion snapper	1,867,502	1,085,391	782,111	42
Gag	799,283	167,616	631,667	79
Red grouper	599,114	235,959	363,155	61
Black grouper	89,144	12,499	76,645	86
Golden tilefish	86,228	85,192	1,036	1
Speckled hind	13,164	1,928	11,236	85
Warsaw grouper	3,158	3,032	126	4
Snowy grouper	34,770	29,963	4,807	14
Black sea bass	14,741,374	2,585,428	12,155,946	82
Blueline tilefish	257,348	236,948	0	8
Yellowedge grouper	3,017	3,017		0
Misty grouper	n/a	n/a	n/a	n/a
Queen snapper	570	570	0	0
Silk snapper	9,982	8,070	1,912	19

Source: MRFSS Web Site.

Headboat fishermen most commonly discarded black sea bass (480,079), followed vermilion snapper (56,434) during 2005-2008 (Table 4-36). Among the grouper species, gag (12,851), red grouper (15,743), black grouper (2,163), and speckled hind (222) were discarded most often (Table 4-36). To estimate the number of dead discards, it was assumed the release mortality rates were: 15% black sea bass, 38% vermilion snapper, 25% gag, 20% black grouper, 20% red grouper, and 100% snowy grouper and golden tilefish. A 100% release mortality rate was also assumed for blueline tilefish, yellowedge grouper, misty grouper, and queen snapper. Silk snapper would have high release mortality, but possibly less than 100%.
Golden tilefish, misty grouper, and queen snapper were not harvested or discarded by headboat fishermen during 2005-2008.

Table 4-36. Total fish released alive or dead on sampled headboat trips during 2005-2008.

Species	released alive	mean#/trip	released dead	mean#/trip	#trips alive	# trips dead	dead discards
Vermilion snapper	56,434	6.63	14,354	1.69	8,515	8,510	35,799
Gag	12,851	1.83	252	0.04	7,015	7,011	3,465
Black grouper	2,163	1.16	33	0.02	1,868	1,868	466
Red grouper	15,743	2.81	217	0.04	5,612	5,609	6,514
Golden tilefish	0	0.00	0	0.00	0	0	0
Speckled hind	222	0.62	1	0.00	359	359	unknown
Warsaw grouper	132	0.73	5	0.03	181	181	unknown
Snowy grouper	101	0.68	5	0.03	149	149	106
Black sea bass	480,079	38.05	13,032	1.03	12,616	12,613	85,044
Blueline tilefish	7	0.18	0	0.00	40	40	7
Yellowedge grouper	20	2.00	0	0.00	10	10	20
Misty grouper	0	0.00	0	0.00	0	0	0
Queen snapper	0	0.00	0	0.00	0	0	0
Silk snapper	154	0.98	21	0.13	157	157	unknown

Note: Release mortality rates used to estimate dead discards are: 15% black sea bass; 38% vermilion snapper; 25% gag, 20% black grouper, 20% red grouper, and 100% each for snowy grouper, golden tilefish, blueline tilefish, yellowedge grouper, misty grouper, and queen snapper. Silk snapper would have high release mortality but possibly less than 100%. Dead discards = (no. released alive * % release mortality rate) + no. released dead.
Source: NMFS Headboat survey.

4.8.1.4 Finfish Bycatch Mortality

SEDAR 17 (2008) recommended a release mortality rate for vermilion snapper of 38% for both the commercial and recreational fisheries. This was based on a recent mortality study conducted by Ruderhshausen *et al*. (2007). Previously, SEDAR 2 (2003) estimated a release mortality rate of 40% and 25% for vermilion snapper taken by commercial and recreational fishermen, respectively. Release mortality rates from SEDAR 2 (2003) were based on cage studies conducted by Collins (1996) and Collins *et al*. (1999). Burns *et al*. (2002) suggested that release mortality rates of vermilion snapper could be higher than those estimated from cage studies because cages protect the fish from predators. A higher release mortality rate is supported by low recapture rates of vermilion snapper in tagging studies. Burns *et al*. (2002) estimated a 0.7% recapture rate for 825 tagged vermilion snapper versus recapture rates for red grouper and gag of 3.8% to 6.0% (Burns *et al*. 2002). McGovern and Meister (1999) estimated a 1.6% recapture rate for 3,827 tagged vermilion snapper. Alternatively, recapture rates could be low if population size was very high or tagged fish were unavailable to fishing gear. Harris and Stephen (2005) indicated approximately 50% of released vermilion snapper caught by one commercial fisherman were unable to return to the bottom. Higher recapture rates were estimated for black sea bass (10.2%), gray triggerfish (4.9%), gag (11%), and greater amberjack (15.1%) (McGovern and Meister 1999; McGovern *et al*. 2005). Burns *et al*. (2002) suggested released vermilion snapper did not survive as well as other species due to

predation. Vermilion snapper, which do not have air removed from swim bladders, are subjected to predation at the surface of the water. Individuals with a ruptured swim bladder or those that have air removed from the swim bladder are subject to bottom predators, since fish would not be able to join schools of other vermilion snapper hovering above the bottom (Burns *et al*. 2002). However, Wilde (2009) reports that venting appears to be increasingly harmful for fish captured from deepwater.

SEDAR 10 (2006) estimated release mortality rates of 40% and 25% for gag taken by commercial and recreational fishermen, respectively. A tagging study conducted by McGovern *et al.* (2005) indicated recapture rates of gag decreased with increasing depth. The decline in recapture rate was attributed to depth related mortality. Assuming there was no depth related mortality at 0 m, McGovern *et al.* (2005) estimated depth related mortality ranged from 14% at 11 – 20 m (36 – 65 feet) to 85% at 71 – 80 m (233 – 262 feet). Similar trends in depth related mortality were provided by a gag tagging study conducted by Burns *et al.* (2002). Overton *et al.* (2008) reported post-release mortality for gag as 13.3%. Release mortality rates are not known for other shallow water grouper species but could be similar to gag since they have a similar depth distribution.

A recent study conducted by Rudershausen *et al.* (2007) estimated release mortality rates of 15% for undersized vermilion snapper and 33% for undersized gag taken with J- hooks in depths of 25 – 50 m off North Carolina. Immediate mortality of vermilion snapper was estimated to be 10% at depths of 25 – 50 m (82-164 feet) and delayed mortality was estimated to be 45% at the same depths. For gag caught at depths of 25 – 50 m (82-164 feet), no immediate mortality was observed but delayed mortality was estimated to be 49%. McGovern *et al.* (2005) estimated a release mortality rate of 50% at 50 m (164 feet), which is similar to the findings of Rudershausen *et al.* (2007). Rudershausen *et al.* (2007) also concluded minimum size limits were moderately effective for vermilion snapper and gag over the shallower portions of their depth range.

Release mortality rates are unknown for black grouper and red grouper, but could be similar to gag as they occupy a similar depth range. Estimates of release mortality rates for these species will be provided by the SEDAR 19 assessment, which began in June, 2009. Wilson and Burns (1996) reported potential mortality rates for released red grouper to be low (0 - 14%) as long as the fish were caught from waters shallower than 44 m (144 feet). Overton *et al.* (2008) reported a release mortality rate of 13% for gag held in enclosures.

Snowy grouper are primarily caught in water deeper than 300 feet and golden tilefish are taken at depths greater than 540 feet; therefore, release mortality of the species are probably near 100% (SEDAR 4 2004). There were fewer golden tilefish, warsaw grouper, snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper discarded by commercial and recreational fishermen during 2005-2008 when compared with the other species considered in Snapper Grouper Amendment 17B (Tables 4-33 and 4-36). Release mortality rates are probably at or near 100% for adult speckled hind and warsaw grouper in deep water. However, juvenile speckled hind and warsaw grouper are also taken in water at the shelf-edge (~165 feet)

where some survival of released species could occur. If release mortality rates of juvenile speckled hind and warsaw grouper are similar to gag, some survival (~50%) would be expected at depths of 165 feet (McGovern *et al.* 2005). Therefore, the overall release mortality for these species could be less than 100%. Estimates of release mortality for speckled hind and warsaw grouper will be provided by SEDAR 27, which is scheduled to take place in 2012. A 100% release mortality rate was also assumed for blueline tilefish, yellowedge grouper, misty grouper, and queen snapper. Silk snapper would have high release mortality, but possibly less than 100%. Several recent studies point to the prevalence and severity of deleterious effects of barotrauma encountered by fishes removed from deepwater (Rummer and Bennett 2005; St. John and Syers 2005; Parker *et al.* 2006; Hannah *et al.* 2008; and Diamond and Campbell 2009).

Release mortality of black sea bass is considered to be low (15%) (SEDAR 2005) indicating minimum size limits are probably an effective management tool for black sea bass. McGovern and Meister (1999) report a recapture rate of 10.2% for 10,462 that were tagged during 1993-1998 suggesting that survival of released black sea bass is high. Rudershausen *et al.* (2007) reported a sub-legal discard rate of 12% for black sea bass. Collins *et al.* (1999) reported venting of the swim bladder yielded reductions in release mortality of black sea bass, and the benefits of venting increased with capture depth. The same study was analyzed by Wilde (2009) to suggest that venting increased the survival of black sea bass, although this was an exception to the general findings of Wilde's (2009) study.

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

Vermilion snapper, gag, black sea bass, red grouper, and black grouper

Current commercial and recreational regulations for the above shallow water and mid-shelf species are listed in **Section 2** (Tables 2-5 and 2-6, respectively). Vermilion snapper and black sea bass were among the most commonly discarded species in the commercial fishery in recent years (2005-2008, Tables 4-33 and 4-34). In the recreational fishery, 86% black grouper, 85% speckled hind, 84% 82% black sea bass, and 79% gag were discarded by private and charter boats (Table 4-35). In the headboat fishery, discard rates were highest in black sea bass followed by vermilion snapper (Table 4-36).

Section 2.4 includes alternatives that would specify ACLs, ACTs, and AMs for vermilion snapper, gag, black sea bass, red grouper, and black grouper. Regulatory discards could increase after a catch limit has been met since fishermen might target co-occurring species. Vermilion snapper are commonly taken on trips where fishermen catch gag, greater amberjack, and gray triggerfish. However, if a catch limit was met, fishermen may be able to avoid areas where restricted species occur or modify methods to reduce the chances of bycatch.

Seasonal and/or longer closures of both commercial and recreational fisheries specified in Snapper Grouper Amendment 16, which has been implemented, could also reduce bycatch mortality of species included in Snapper Grouper Amendment 17B. A longer spawning seasonal closure could enhance the reproductive potential of the stock. For example Amendment 16 has established a January – April spawning season closure for gag, red grouper, black grouper, and shallow water grouper species. Gag are in spawning condition from December through April each year. There is some evidence spawning aggregations may be in place before and after a spawning season (Gilmore and Jones 1992). When aggregated, gag are extremely susceptible to fishing pressure since the locations are often well known by fishermen. Gilmore and Jones (1992) showed that the largest and oldest gag in aggregations are the most aggressive and first to be removed by fishing gear. Since gag change sex, larger and older males can be selectively removed. As a result, a situation could occur where there are not enough males in an aggregation to spawn with the remaining females. Furthermore, the largest most fecund females could also be selectively removed by fishing gear. Therefore, a spawning season closure for all shallow water grouper species would be expected to protect grouper species when they are most vulnerable to capture, reduce bycatch of co-occurring grouper species, increase the percentage of males in grouper populations, enhance reproductive success, and increase the magnitude of recruitment. Increased bycatch mortality is accounted for in analyses and overall mortality is expected to decrease over time. Other actions in Amendment 16, which could reduce bycatch of snapper grouper species, include a reduction in the recreational bag limit to 1 gag or black grouper (combined) per day within a grouper aggregate bag limit of 3 fish and the establishment of a commercial quota for gag. When the commercial quota is met, all fishing for or possession of shallow water grouper species will be prohibited.

Unobserved mortality due to predation or trauma associated with capture could be substantial (Burns *et al.* 1992; Rummer and Bennett 2005; St. John and Syers 2005; Parker *et al*. 2006; Rudershausen *et al.* 2007; Hannah *et al.* 2008, Diamond and Campbell 2009). Snapper Grouper Amendment 16 includes actions that require the use of dehooking devices, which could help reduce bycatch of vermilion snapper, black sea bass, gag, red grouper, and black grouper. Dehooking devices can allow fishermen to remove hooks with greater ease and more quickly from snapper grouper species without removing the fish from the water. If a fish does need to be removed from the water, dehookers could still reduce handling time in removing hooks, thus increasing survival (Cooke *et al.* 2001).

Golden tilefish, snowy grouper, speckled hind, and warsaw grouper

Sections 2.1 through **2.3** include alternatives that would prohibit fishing for and retention of speckled hind, warsaw grouper, snowy grouper, and other deepwater species (blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper). Speckled hind and warsaw grouper occupy a broad depth zone and co-occur with deepwater and mid-shelf species. Juvenile speckled hind and warsaw grouper are commonly taken at the shelf edge with species such as vermilion snapper and gag. Since the populations of speckled hind and warsaw grouper are likely depressed, the numbers of older fish, which

are found in deeper water, would be reduced. As populations of speckled hind and warsaw grouper recover and older fish become more established, a greater co-occurrence of these species with other deepwater species like snowy grouper and blueline tilefish would be expected. Therefore, alternatives that would prohibit fishing for or retention of speckled hind, warsaw grouper, snowy grouper, and deepwater species in the commercial and recreational sectors decrease the chances of overfishing of these species as well as reduce fishing mortality of co-occurring species that could be taken incidentally when targeting species such as snowy grouper.

4.8.2 Ecological Effects Due to Changes in the Bycatch

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

Management alternatives proposed in Snapper Grouper Amendment 17B for vermilion snapper, gag, red grouper, black grouper, golden tilefish, speckled hind, warsaw grouper, snowy grouper, and black sea bass could increase the number of regulatory discards. However, alternatives are being considered in Amendment 17B (**Section 2**) that could decrease bycatch.

Overall fishing effort could decrease in the commercial and recreational sectors in response to more restrictive management measures, thereby, reducing the potential for bycatch. Furthermore, some alternatives would prohibit fishing for and retention for speckled hind, warsaw grouper, deepwater grouper species, and snowy grouper, which could decrease discards for target species as well as co-occurring species. Proposed actions include ACLs, ACTs, and AMs for vermilion snapper, gag, red grouper, black grouper, and black sea bass, which have the potential to increase discards. There is also a potential for increased discards with reduced bag limits for snowy grouper and golden tilefish. The extent to which the discards increase would depend on the ability of fishermen to avoid regulated species when a catch limit or bag limit is met and the extent to which effort would shift to other species and fisheries. Reduced fishing pressure would be expected to result in an increase in the mean size/age as well as overall biomass of the species listed in Snapper Grouper Amendment 17B. Thus ecological changes could occur in the community structure of reef ecosystems through actions that would end overfishing. These ecological changes could affect the nature and magnitude of bycatch of species in Amendment 17B as well as other species. However, many of the species listed in this amendment have spatial and temporal coincidence and the benefits could be shared among them.

Data from North Carolina presented to the Council indicated fishermen with snapper grouper permits also fish in the nearshore gillnet fisheries. Fishermen with snapper grouper permits in other areas also participate in various state fisheries. It is expected that if efforts shift to these fisheries, there could be impacts to protected species. NOAA Fisheries Service will track and evaluate any increased risk to protected species.

A Catch Shares program is under consideration for the snapper grouper fishery that could substantially reduce bycatch by providing fishery participants an incentive to fish efficiently and to better handle their catch to maximize profits. A Catch Shares program could stabilize markets and prices by allowing catches to be delivered on demand. This would help fishermen target when they wanted to fish, where they wanted to fish, and which species they wanted to catch thereby reducing bycatch.

The Comprehensive ACL Amendment for species in FMPs not experiencing overfishing could propose 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. Each group would be represented by an indicator species that has been recently assessed or is scheduled for a SEDAR assessment in the future. Snapper Grouper Amendment 14 is currently in place, which establishes Marine Protected Areas, and could also reduce bycatch of species in Snapper Grouper Amendment 17B.

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

Some proposed actions such as a decrease in the bag limit for snowy grouper and golden tilefish could increase discards unless there was an associated reduction in recreational effort. Snapper Grouper Amendment 17B includes alternatives that could close commercial and recreational fisheries for snowy grouper, speckled hind, warsaw grouper, and deepwater species (snowy grouper, speckled hind, golden tilefish, and warsaw grouper). Since commercial/recreational closure for these deepwater species could overlap with other co-occurring species (misty grouper, yellowedge grouper, blueline tilefish, queen snapper, and silk snapper), there could be substantial reductions in bycatch and fishing mortality.

More restrictive management measures proposed in Snapper Grouper Amendment 17B could result in an effort shift to other species and fisheries causing a change in the magnitude of harvest and number of discards in those fisheries. Reduced fishing pressure on species in this amendment would be expected to result in an increase in the mean size and age. In addition, biomass and the percentage of males for grouper species would be expected to increase. The relative abundance, size structure, and age structure of other species in reef communities could be expected to change in response to reduced fishing pressure on species in Amendment 17B as well as potential shifts in effort. Thus, ecological changes could occur in the community structure of reef ecosystems through the proposed actions. These ecological changes could affect the nature and magnitude of bycatch over time.

4.8.4 Effects on Marine Mammals and Birds

Under Section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. Of the gear utilized within the snapper grouper fishery, only the black sea bass pot is considered to pose an entanglement risk to 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 2010 List of Fisheries classifies as a Category II (74 FR 27739; June 11, 2009). 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 which sub-samples 20% of the vessels with an active permit. Since August 2001, only three interactions with marine mammals have been documented; each was taken by handline gear and each released alive (McCarthy SEFSC database). The bottom longline/hook-and-line component of the South Atlantic snapper grouper fishery remains a Category III under the LOF.

Although the black sea bass pot fishery can pose an entanglement risk to large whales due to their distribution and occurrence, sperm, fin, sei, and blue whales are unlikely to overlap with the black sea bass pot fishery operated within the snapper grouper fishery since it is executed primarily off North Carolina and South Carolina 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).

North Atlantic 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 North Atlantic right and humpback whale entanglement in black sea bass pot gear.

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

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

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

Management alternatives in Snapper Grouper Amendment 17B would be expected to affect the cost of fishing operations. It is likely that all four states (NC, SC, GA & FL) would be affected by the regulations (closures, ACLs, etc.) and the variety/number of species included in this amendment. North Carolina, South Carolina, and the Florida Keys will have higher significant effects when compared with those in Georgia through Southeast Florida (Figures 4-17a and 4-17b). Additionally, factors such as waterfront property values, availability of less expensive imports, etc. may affect economic decisions made by recreational and commercial fishermen.

Snapper Grouper Amendment 18 (under development) proposes to enhance current data collection programs. This might provide more insight in calculating the changes in fishing, processing, disposal, and marketing costs.

4.8.6 Changes in Fishing Practices and Behavior of Fishermen

Management regulations proposed in Snapper Grouper Amendment 17B could result in a modification of fishing practices by commercial and recreational fishermen, thereby affecting the magnitude of discards. There is a potential for increased discards with reduced bag limits for snowy grouper and golden tilefish. Prohibiting take of deepwater species as well as closed areas to protect red snapper being proposed in Snapper Grouper Amendment 17A would be expected to provide a substantial decrease in bycatch. Furthermore, closed seasons, new or reduced quotas, reduced bag limits, and increased size limits could cause some commercial and recreational fishermen to reduce effort. However, it is difficult to quantify any of the measures in terms of reducing discards until the magnitude of bycatch has been monitored over several years.

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

Research and monitoring is needed to understand the effectiveness of proposed management measure in reducing bycatch. Additional work is needed to determine the effectiveness of measures in Snapper Grouper Amendment 16 and by future actions being proposed by the Council to reduce bycatch. Snapper Grouper Amendment 18 is being developed, which

proposes to enhance current data collection programs. Some observer information has recently been provided by MARFIN and Cooperative Research Programs but more is needed. Approximately 20% of commercial fishermen are asked to fill out discard information in logbooks; however, a greater percentage of fishermen could be selected with emphasis on individuals that dominate landings. Furthermore, the use of electronic logbooks could be enhanced to enable fishery managers to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Additional administrative and enforcement efforts will be needed to implement and enforce these regulations.

4.8.8 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.

4.8.9 Changes in the Distribution of Benefits and Costs

Attempts were made to ensure reductions provided by preferred management measures are equal in the commercial and recreational sectors. The extent to which these management measures will increase or decrease the magnitudes of discards is unknown. Proposed closures for deepwater species as well as area closures for red snapper proposed in Snapper Grouper Amendment 17A are likely to provide substantial decreases in bycatch. Some measures specified in Snapper Grouper Amendment 16, such as the requirement for dehooking devices, a recreational/commercial seasonal closure for gag, reduction of recreational bag limits, and closing all shallow water groupers when a gag quota is projected to be met or during a gag seasonal closure could help to reduce bycatch. It is likely that some proposed management measures such as bag limits for snowy grouper and golden tilefish could increase the number of discards. However, this depends on whether fishermen shift effort to other species, seasons, or fisheries and if effort decreases in response to more restrictive management measures as well as changes in community structure and age/size structures that could result from ending overfishing.

4.8.10 Social Effects

The social effects of all the management measure, including those most likely to reduce bycatch, are described in **Section 4**.

4.8.11 Conclusion

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality in the South Atlantic snapper grouper fishery using the ten factors provided at 50 CFR 600.350(d)(3)(i). In summary, proposed closures for deepwater species could provide decreases in bycatch of Snapper Grouper Amendment 17B species and also co-occurring species. The requirement of dehooking devices, a recreational/commercial seasonal closure for gag, reduction of recreational bag limits, and closing all shallow water groupers when a gag quota is projected to be met or during a gag seasonal closure specified in Snapper Grouper Amendment 16 (approved by the Secretary) could also help to reduce bycatch. It is likely that some management measures such as bag limits for snowy grouper and golden tilefish could increase the number of discards. However, this depends on whether fishermen shift effort to other species, seasons, or fisheries and if effort decreases in response to more restrictive management measures as well as changes in community structure and age/size structures that could result from ending overfishing. Furthermore, overall fishing effort could decrease in the commercial and recreational sectors in response to more restrictive management measures, thereby reducing the potential for bycatch.

There is likely to be an interactive effect of the preferred management measures in Snapper Grouper Amendment 17B on bycatch of species addressed in the amendment with associated species in reef ecosystems. Closures for multiple deep water species such as snowy grouper and blueline tilefish is likely to decrease the incentive to target any deepwater species and reduce bycatch. Furthermore, area prohibitions to protect red snapper (Snapper Grouper Amendment 17A) would eliminate bycatch of red snapper and co-occurring species. Reduced fishing pressure on species in Amendment 17B would be expected to result in an increase in the mean size/age of affected species. In addition, an increase would be expected in the percentage of male groupers, and population biomass. Overlapping seasonal closures for red porgy, greater amberjack, mutton snapper, gag, shallow water groupers and vermilion snapper with proposed actions in this amendment could be expected to reduce bycatch and fishing mortality of many co-occurring species. The relative abundance, size structure, and age structure of other species in reef communities could be expected to change in response to reduced fishing pressure on species in Amendment 17B as well as potential shifts in effort. Thus, ecological changes could occur in the community structure of reef ecosystems through actions that would end overfishing. These ecological changes could affect the nature and magnitude of bycatch over time.

Additional measures to reduce bycatch in the snapper grouper fishery are being developed. The Comprehensive ACL Amendment could propose measures to reduce bycatch in the snapper grouper fishery including species grouping based on biological, geographic, economic, taxonomic, technical, social, and ecological factors. Each group could be represented by an indicator species, which has been recently assessed or is scheduled for a SEDAR assessment in the future.

4.9 Unavoidable Adverse Effects

There are several unavoidable adverse effects on the socioeconomic environment that may result from the implementation of Amendment 17B. A brief summary of those effects follows.

For speckled hind and warsaw grouper **Alternative 4 (Preferred)** is expected to reduce net operating revenues in the snapper-grouper fishery by about $292,000 or by 3.3% (Figures 4-6a and 4-6b). The effects of this alternative are expected to be slightly smaller than those of **Alternative 3**. The expected reductions in net operating revenues would be incurred primarily by boats that fish with vertical lines (Figure 4-6a), although boats with longlines would incur greater losses in percentage terms (Figure 4-6b). Vessels that use bottom longline gear are expected to incur losses that average approximately 11.5% of base net operating revenues. Net operating revenues for boats in North Carolina are predicted to decline by an average of 7.2% per year, while net operating revenues for boats in the Keys are predicted to decline by approximately 3.9% per year compared to the no-action alternative.

For golden tilefish the simulation model predicts that these reductions in commercial catch limits would generate an overall reduction in net operating revenues that ranges from approximately $3,500 to $12,500 or less than 0.15% to the entire snapper-grouper fishery (Figures 4-9a and 4-9b).). Boats that use bottom longlines are predicted to lose 35% and 36% of baseline net operating revenues, respectively. Although commercial landings of golden tilefish would decline by approximately 50%, the expected reductions in dockside revenues would be partially offset by lower operating costs as fewer trips would be taken. Losses would be incurred primarily by longline boats in central Florida and South Carolina (Figures 4-10a and 4-10b).

For black grouper, red grouper, gag, vermilion snapper, and black sea bass, the aggregate catch limit for gag, red grouper and black grouper in **Alternative 2b (Preferred)** is expected to reduce commercial net operating revenues by slightly more than $100,000 per year, or only 1.2% of the predicted base net operating revenues for Amendment 17B (Figures 4-12a and 4-12b). These results are expectations based on the four-year average with data from 2005-2008. If fishing and regulatory conditions in the near future closely resemble conditions in 2007, then the simulation model predicts that net operating revenues would decline by about $177,000 or 2.0% compared to baseline conditions. If conditions in the near future were similar to conditions in 2008, then the model predicts that net operating revenues would decline by $236,000 or 2.4%. The adverse economic effects on the recreational sector would be immediate under **Alternative 5b (Preferred)** once the ACL is projected to be met in the current year. ACL reductions in subsequent years could trigger larger adverse economic effects. Considering that projections may be inaccurate, a fishery closure under **Alternative 5b (Preferred)** could unduly penalize the recreational sector. Of course, this could also mean that ACL adjustments in the following year would not result in more severe economic effects. A reverse condition would ensue if the projection inaccuracy were to lead to overharvest of any of the subject species in the current year. Although a fishery closure, in terms of fixed shortened

season under **Alternative 5a** or variable shortened season under **Alternative 5b (Preferred)**, would not necessarily result in fishing trip cancellations, benefits would still be negatively affected due to increased fishing costs or reduced quality of fishing. In addition, both sub-alternatives would likely have distributional implications across the various fishing modes likely in proportion to the importance of a species to a particular fishing mode. For example, black sea bass is heavily dominated by the shore/private/rental mode whereas vermilion snapper is dominated largely by headboats (see Table 3-41), thus the adverse economic effects would be more on shore/private/rental mode with respect to black sea bass but more on headboats with respect to vermilion snapper.

4.10 Effects of the Fishery on the Environment

The biological impacts of the proposed actions are described in Section 4.0, including impacts on habitat. No actions proposed in this amendment are anticipated to have any adverse impact on EFH or EFH-HAPCs for managed species including species in the snapper grouper complex. No additional impacts of fishing on EFH were identified during the public hearing process. Therefore the Council has determined no new measures to address impacts on EFH are necessary at this time. The Council's adopted habitat policies, which may directly affect the area of concern, are available for download through the Habitat/Ecosystem section of the Council's website: http://www.safmc.net/EcosystemManagement/HabitatProtection/HabitatPolicies/tabid/245/Default.aspx.

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, a series of technical workshops were conducted by Council habitat staff and a draft plan that includes new information has been completed pursuant to the Final EFH Rule.

4.11 Damage 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 Snapper Grouper Fishery Management Plan through Amendment 7 combined have significantly reduced the impact of the snapper grouper fishery on EFH. The 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 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 Snapper Grouper Amendment 8 (SAFMC 1997), 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 Snapper Grouper Amendment 9 (SAFMC 1998b), 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. Snapper Grouper Amendment 13C (SAFMC 2006) increased mesh size in the back panel of pots, which has reduced bycatch and retention of undersized fish. Snapper Grouper Amendment 15B (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.

Snapper Grouper Amendment 16 (SAFMC 2008c) includes 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 Coral and Shrimp FMPs 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 HAPC and the Rock Shrimp closed area (see the Shrimp and Coral FMP/Amendment documents for additional information).

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

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

The relationship between short-term uses and long-term productivity will be affected by this amendment. The proposed actions could restrict the harvest of gag, vermilion snapper, black sea bass, snowy grouper, golden tilefish, black grouper, red grouper, speckled hind, and warsaw grouper in the short-term for both the commercial and recreational sectors of the fishery. However, reductions in harvest are expected to benefit the long-term productivity of these species.

4.13 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. There are no irreversible commitments for this amendment. While the proposed actions would result in irretrievable losses in consumer surplus and angler expenditures, failing to take action would compromise the long-term sustainability of the stocks.

Since the Snapper Grouper FMP and its implementing regulations are always subject to future changes, proceeding with the development of Snapper Grouper Amendment 17B does not represent an irreversible or irretrievable commitment of resources. NOAA Fisheries Service always has discretion to amend its regulations and may do so at any time, subject to the Administrative Procedures Act.

4.14 Monitoring and Mitigation Measures

The proposed actions would adversely affect immediate, short-term net revenues of some commercial and for-hire fishermen in the South Atlantic. The proposed actions would also adversely affect short-term consumer surplus of some recreational anglers in the South Atlantic and may result in cancelled trips and reduced expenditures to the fishery and associated industries. However, it is anticipated reductions in fishing pressure, which will reduce the likelihood that these stocks will be declared overfished, will assist in restoring the size and age structure to more natural conditions and allow stock biomass to increase to more sustainable and productive levels. As a result, the amount of fish that can be harvested should increase as the stocks rebuild. Methods to monitor the progress of rebuilding efforts may be highly variable. Large scale research entities such as MARMAP and SEFSC research cruises may gather fishery-independent data while cooperative research programs with academic institutions and headboat surveys could be used to supplement fishery-dependant data along with the MRIP reporting system. Dependent upon funding, more monitoring efforts may be implemented in the future with special emphasis on large closed areas such as the proposed deepwater snapper grouper closure in this amendment.

The short-term, adverse effects of ending overfishing can be mitigated to some degree by the type of regulations the Council selects to manage reduced catch levels. The Council's preferred alternatives contain those measures that are believed to best mitigate the unavoidable, short-term, adverse effects of ending overfishing.

4.15 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 direction 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…".

Stock assessments have been conducted on vermilion snapper, gag, black sea bass, snowy grouper, and golden tilefish using the best available data available. Status determinations for these species were derived from the 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 Council and their Scientific and Statistical Committee (SSC). SEDAR participants, the Council's Advisory Panels, the Council, and NMFS staff reviewed and considered any concerns about the adequacy of the data. **Section 4.6** lists research needs that resulted from these assessments. The Council's SSC determined that the assessments were based on the best available data.

At their December 2009 meeting, the SSC reported that the magnitude of harvest reductions that would result from changing the snowy grouper bag limit from 1 fish per person per day, to 1 fish per vessel per day was not accounted for in the biological analysis. Currently adequate data are not available for quantitatively determining the potential harvest reductions of the reduced bag limit. However, changing the bag limit for snowy grouper will likely yield some harvest reduction in the recreational sector.

The Council acknowledged, while stock assessment findings are uncertain, there is no reason to assume such uncertainty leads to unrealistically optimistic conclusions about stock status. Rather, the stocks could be in worse shape than indicated by the stock assessment. Uncertainty due to unavailable or incomplete information should not be used as a reason to avoid taking action. Therefore, there are reasonable foreseeable significant adverse effects of not taking action to end overfishing. Failure to take action could result in a worsening of stock status, persistent foregone economic benefits, and more severe corrective actions to end overfishing in the future.

Where information is unavailable or incomplete, such as is the case with estimates of dead discards that could occur when a species is incidentally caught during a seasonal closure or after a quota is met, management measures have been designed to adopt a conservative approach to increase the probability overfishing does not occur.

5 Regulatory Impact Review

5.1 Introduction

The NOAA Fisheries Service requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: (1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; (2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and, (3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the proposed regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866 and provides information that may be used in conducting an analysis of impacts on small business entities pursuant to the Regulatory Flexibility Act (RFA). This RIR analyzes the expected impacts that this action would be expected to have on the commercial and recreational snapper grouper fisheries. Additional details on the expected economic effects of the various alternatives in this action are included in **Section 4.0** and are incorporated herein by reference.

5.2 Problems and Objectives

The purpose and need, issues, problems, and objectives of the proposed amendment are presented in **Section 1.2** and are incorporated herein by reference. In summary, the purpose of this amendment is establish ACLs and AMs for 9 species subject to overfishing pursuant to Magnuson-Stevens Act requirements, and update the framework procedure for the FMP to include ACLs, ACTs, and AMs. These measures are expected to aid in the prevention of overfishing and the achievement of Optimum Yield (OY) from the South Atlantic snapper grouper fishery.

5.3 Methodology and Framework for Analysis

This RIR assesses management measures from the standpoint of determining the resulting changes in costs and benefits to society. To the extent practicable, the net effects of the proposed measures are stated in terms of producer and consumer surplus, changes in profits, employment in the direct and support industries, and participation by charter boat fishermen and private anglers. In addition, the public and private costs associated with the process of developing and enforcing regulations on fishing for snapper grouper in waters of the U.S. South Atlantic are provided.

5.4 Description of the Fishery

A description of the South Atlantic snapper grouper fishery is contained in **Section 3.8** and is incorporated herein by reference.

5.5 Impacts of Management Measures

Details on the economic impacts of all alternatives are included in Section 4 and are included herein by reference. The following discussion includes only the expected impacts of the preferred alternatives.

5.5.1 Speckled Hind and Warsaw Grouper

The overall impacts of this action are discussed in **Section 4.1** of this document, and is hereby incorporated by reference.

Commercial

Overall, **Alternative 4 (Preferred)** is expected to reduce net operating revenues in the snapper-grouper fishery by about $292,000 or by 3.3% (Figures 4-6a and 4-6b). The expected reductions in net operating revenues would be incurred primarily by boats that fish with vertical lines (Figure 4-6a), although boats with longlines would incur greater losses in percentage terms (Figure 4-6b). Vessels that use bottom longline gear are expected to incur losses that average approximately 11.5% of base net operating revenues. Net operating revenues for boats in North Carolina are predicted to decline by an average of 7.2% per year, while net operating revenues for boats in the Keys are predicted to decline by approximately 3.9% per year compared to the no-action alternative.

Recreational

By allowing harvest, possession, and retention of deepwater species within a depth of 240 feet, **Alternative 4 (Preferred)** would provide lower negative economic effects than **Alternative 3**. The magnitude of differential economic effects would depend on the level of recreational activities for the deepwater species in the open areas. This amount cannot be estimated with available information. In the same manner, **Alternative 5** would result in less negative economic effects than **Alternative 3** and **Alternative 4 (Preferred)**, but the differential effects cannot be estimated.

In addition, the economic effects of **Alternative 4 (Preferred)** would be lower than those of **Alternative 3** but higher than those of **Alternative 2**. Also, the economic effects of **Alternative 5** would be less than those of **Alternative 4 (Preferred)**, but possibly greater than those of **Alternative 2**.

5.5.2 Golden Tilefish Allocations

The overall impacts of this action are discussed in **Section 4.2.1** of this document, and is hereby incorporated by reference.

Commercial

Economic impacts on the commercial fishery for the preferred golden tilefish allocation alternative are included in the economic impacts discussion of the preferred golden tilefish ACL alternative (Section 5.5.3). And is hereby incorporated by reference.

Recreational

Economic impacts on the commercial fishery for the preferred golden tilefish allocation alternative are included in the economic impacts discussion of the preferred golden tilefish ACL alternative (Section 5.5.3). And is hereby incorporated by reference.

5.5.3 Golden Tilefish ACLs

The overall impacts of this action are discussed in **Section 4.2.2** of this document, and is hereby incorporated by reference.

Commercial

The reductions are approximately 5% or less for most management scenarios and range from 3,600 lbs (1.2%) for the scenario with allocation **Alternative 3 (Preferred)** and ACL **Alternative 1 (Status Quo)** to a 15,100 lb reduction (5.1%) for allocation **Alternative 2** and ACL **Alternative 2 (Preferred)**. The simulation model predicts that these reductions in commercial catch limits would generate an overall reduction in net operating revenues that ranges from approximately $3,500 to $12,500 or less than 0.15% to the entire snapper-grouper fishery (Figures 4-9a and 4-9b). The commercial catch limit would decline by 144,800 pounds (49%) with ACL **Alternative 1 (Status Quo)** and by 149,200 lbs (50.6%) with ACL **Alternative 2 (Preferred)**. Net operating revenues for the entire commercial snapper-grouper fishery are predicted to decline by approximately $200,000 or 2.3% and $207,000 or 2.4% for these scenarios (Figures 4-9a and 4-9b). Boats that use bottom longlines are predicted to lose 35% and 36% of baseline net operating revenues, respectively. Although commercial landings of golden tilefish would decline by approximately 50%, the expected reductions in dockside revenues would be partially offset by lower operating costs as fewer trips would be taken. Losses would be incurred primarily by longline boats in central Florida and South Carolina (Figures 4-10a and 4-10b).

Recreational

Given the various allocation alternatives, the recreational ACL would be equivalent to 11,613 pounds gutted weight, 8,747 pounds gutted weight, or 145,783150,190 gutted weight (Table 4-14). Based on 2003-2008 average recreational landings of 21.3 thousand pounds (Table 4-15d), the two low recreational ACLs would likely be exceeded even if landings were averaged over a number of years. It is likely that implementation of an AM would increasingly shorten the fishing season over the years. The high ACL, on the other hand, is very unlikely to be exceeded, and thus would afford the recreational sector more opportunities to derive more economic benefits from the fishery. Under **Allocation Alternative 3 (Preferred)**, the recreational ACL of 8,747 pounds gutted weight would be met sometime in May and the ACL of 11,613 pounds would be reached in July. As noted earlier, the ACL of 145,783 pounds would unlikely be met.

5.5.4 Snowy Grouper

The overall impacts of this action are discussed in **Section 4.3** of this document, and is hereby incorporated by reference.

Commercial

If the shared ACL results in the commercial sector harvesting more than the 82,900 pounds allowed under **Alternatives 1 (Status Quo)** and **2 (Preferred)**, the commercial sector would benefit in the short-term up to $13,541 in ex-vessel revenues (4,354 pounds). If the commercial sector harvests less than 82,900 pounds allowed under **Alternatives 1 (Status Quo)** and **2 (Preferred)**, then the commercial sector will experience negative short-term economic effects, the amount of which depends on how much less is harvested. Either scenario could result in a shorter season than that experienced under **Alternatives 1 (Status Quo)** and **2 (Preferred)**. There would be long-term positive economic effects for the commercial fishery due to implementation of an AM for the recreational fishery, assuming the recreational catch can be accurately monitored.

Recreational

Under **Alternative 2 (Preferred)**, the recreational sector would remain open all year long. However, if the monthly landings distribution in 2008 persisted into the future, the recreational ACL of about 523 fish would be reached in July (Table 4-17b). Implementation of AMs would shorten the following year's season.

5.5.5 Black grouper, black sea bass, gag, red grouper, and vermilion snapper

The overall impacts of this action are discussed in **Section 4.4** of this document, and is hereby incorporated by reference.

Commercial

The aggregate catch limit for gag, red grouper and black grouper in **Alternative 2b (Preferred)** is expected to reduce commercial net operating revenues by slightly more than $100,000 per year, or only 1.2% of the predicted base net operating revenues for Snapper Grouper Amendment 17B (Figures 4-12a and 4-12b). If fishing and regulatory conditions in the near future closely resemble conditions in 2007, then the simulation model predicts that net operating revenues would decline by about $177,000 or 2.0% compared to baseline conditions. If conditions in the near future were similar to conditions in 2008, then the model predicts that net operating revenues would decline by $236,000 or 2.4%.

Recreational

Alternative 2b (Preferred) would trigger an AM implementation for all three stocks. It is then possible that under **Alternative 2a** the economic effects of AMs would be limited to one or two fisheries whereas those effects could affect all three fisheries under **Alternative 2b (Preferred)**. Indeed, fishers would have more flexibility in adjusting their activities under **Alternative 2b (Preferred)** so as not trigger or at least to delay the implementation of AMs.

Alternative 4 (Preferred) would appear to provide more stability in the estimation of harvests vis-à-vis the chosen ACL, since there is a good deal of year to year variations in recreational harvests of the subject five species. One year of high harvests due to a variety of reasons could trigger AM implementation when there is actually a downward trend in harvest, or conversely a year of very low harvest would not trigger AM implementation when in fact there is an upward trend in harvest, particularly if this trend is brought about by increasing effort. It would appear then that averaging of harvests over a range of years would potentially allow consideration of both short-term and long-term economic effects. The adverse economic effects on the recreational sector would be immediate under **Alternative 5b (Preferred)** once the ACL is projected to be met in the current year. ACL reductions in subsequent years could trigger larger adverse economic effects. Considering that projections may be inaccurate, a fishery closure under **Alternative 5b (Preferred)** could unduly penalize the recreational sector. Of course, this could also mean that ACL adjustments in the following year would not result in more severe economic effects. A reverse condition would ensue if the projection inaccuracy were to lead to overharvest of any of the subject species in the current year.

5.5.6 Update the framework procedure for specification of Total Allowable Catch (TAC) for the Snapper Grouper Fishery Management Plan (FMP) to incorporate Annual Catch Limits (ACLs), Annual Catch Targets (ACTs), and Accountability Measures (AMs).

The overall impacts of this action are discussed in **Section 4.5** of this document, and is hereby incorporated by reference.

Commercial and Recreational

There is likely to be no direct economic impacts resulting from **Alternative 2 (Preferred)** since it is expected that the changes that will occur are simply changes in terminology. However, the action will enable framework actions to be implemented more quickly than actions through the amendment process since they require less public and Council participation. Eliminating these time-consuming factors would enable harvest modifications to be expedited when they are most needed and this could improve management of the stocks and indirectly increase long-term economic benefits.

5.6 Public and Private Costs of Regulations

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

Council costs of document preparation,
meetings, public hearings, and information
dissemination……...…….. $200,000

NOAA Fisheries administrative costs of document
preparation, meetings and review $200,000

Annual law enforcement costs .....unknown

TOTAL $400,000

Law enforcement currently monitors regulatory compliance in these fisheries under routine operations and does not allocate specific budgetary outlays to these fisheries, nor are increased enforcement budgets expected to be requested to address components of this action. In practice, some enhanced enforcement activity might initially occur while the fishery becomes familiar with the new regulations. However, the costs of such enhancements cannot be forecast. Thus, no specific law enforcement costs can be identified.

5.7 Summary of Economic Impacts

Previous sections compared the effects of proposed alternatives within each Action by assuming the No-Action alternative for other Actions. This section compares the joint effects of the Council's preferred alternatives for all Actions with the Status-Quo alternative for Snapper Grouper Amendment 17B. The Council's preferred alternatives include **Alternative 4 (Preferred)** for speckled hind and warsaw grouper, **Alternative 3 (Preferred)** for tilefish allocation, **Alternative 2 (Preferred)** for golden tilefish total allowable catch, and **Alternative 2b (Preferred)** for the gag, red grouper, and black grouper ACL. The respective status quo alternatives include the simulated effects on the commercial fishery of Snapper Grouper Amendments 13C and 16.

An important characteristic of the commercial snapper-grouper fishery is that fishermen usually catch more than one species on the same trip. If two or more proposed regulations affect different species that generally are landed on the same trips, then it is possible that their joint effects could differ from the sum of the effects for each regulation considered separately.

This is not the case for Snapper Grouper Amendment 17B, which considers additional management for three relatively distinct portions of the snapper-grouper fishery. The proposed management alternatives for speckled hind and warsaw grouper primarily would affect deepwater species and have little effect on trips that land shallow water groupers or tilefish. The proposed alternatives for red grouper and black grouper primarily would affect trips with shallow water groupers and have little effect on trips that land deep water species or tilefish. Similarly, the proposed alternatives for tilefish primarily would affect trips for tilefish and have little effect on trips that land shallow water groupers or the deep water species. As a result, the effect of the preferred alternatives when evaluated simultaneously is approximately equal to the sum of the effects of each preferred alternative when evaluated separately.

Average annual net operating revenues to boat owners and crew after deducting trip costs would decline from $8.78 million in constant 2008 dollars to approximately $8.38 million with the preferred management alternatives for speckled hind, warsaw grouper, tilefish, gag, red grouper, and black grouper. The average annual difference of -$0.40 million between the Status Quo and Preferred management scenarios represents a 4.6% average annual short-term economic loss that would be incurred by the commercial snapper-grouper fishery. Actual losses would vary annually depending on economic, biological and environmental conditions. For example, the expected losses of $0.80 million (an 8.2% loss compared to Status Quo) with fishing conditions as characterized in 2008 would be approximately twice the average annual loss of $0.40 million, whereas the predicted losses of approximately $0.15 million (a 1.9% loss compared to Status Quo) with fishing conditions as characterized in 2005 would be approximately half the average (Figures 4-15a and 4-15b).

The expected economic losses differ by gear. Most of the losses in dollars would be incurred by boats on trips with vertical line gear because that is the predominant gear in

the fishery. Fishermen on trips with longlines represent a smaller component of the snapper-grouper fishery, but would incur greater percentage losses because the prohibition on the harvest of deep water species in waters deeper than 240 feet would eliminate most of the longline fishery for snowy grouper and yellowedge grouper. Fishermen on trips with vertical line gear are expected to lose an annual average of slightly more than $320,000 per year in constant 2008 dollars, or about 4.6% compared to No Action, while fishermen on trips with bottom longlines are expected to lose an average of $68,000 per year, or about 13.2% compared to their earnings with the Status Quo (Figures 4-16a and 4-16b).

The economic effects of Snapper Grouper Amendment 17B also are expected to differ by state of landing. Fishermen from North Carolina, South Carolina, and the Florida Keys would incur the greatest losses in terms of both dollars and percentages, whereas fishermen from Georgia through southeast Florida would be affected to a lesser extent (Figures 4-17a and 4-17b). The geographic distribution of expected reductions in net operating revenues primarily reflects the location of fishing activities for the species whose harvest would be prohibited in waters deeper than 240 feet.

Most vessels would not be affected by the preferred alternatives. The logbook database includes trip reports for 776 vessels in 2005, 765 vessels in 2006, 760 vessels in 2007 and 791 vessels in 2008. Over the 4-year period, approximately 77.3% of vessels would not be affected by the preferred alternatives in Snapper Grouper Amendment 17B. Approximately 13.5% would be expected to incur losses of less than $1,000 per vessel. Another 6.3% would be expected to incur losses between $1,000 and $5,000 per vessel, and 2.2% would be expected to incur losses of more than $5,000. Approximately 0.7% would be expected to realize a gain in net operating revenues. Based on logbook data for 2005-2008, the maximum loss per vessel would be approximately $131,000 given conditions in 2008, and the maximum gain per vessel would be approximately $3,000 given conditions in 2006.

The simulation results suggest that most of the proposed management alternatives that were evaluated would not have major *additional* economic effects when compared to the no-action alternative for the entire commercial snapper-grouper fishery, *after accounting for the expected effects of Amendments 13C and 16*. This is because Amendment 17B would not impose additional regulations for the commercial harvest of high-volume species such as vermilion snapper, yellowtail snapper, and gag.

On average, approximately 72% of the overall, expected annual reduction in net operating revenues would occur in response to the prohibition on the harvest and landing of deep water groupers and snappers and blueline tilefish in waters deeper than 240 feet. Approximately 26% of the expected annual reduction would occur in response to the aggregate ACL for gag, red grouper, and black grouper, and the remaining 2% reduction is expected in response to a lower ACL for tilefish.

The analysis evaluated the economic effects of proposed alternatives for each management action given the No-Action alternative for other actions, as well as the

simultaneous effects of all preferred alternatives for the various actions in Snapper Grouper Amendment 17B. In addition, the management alternatives in Amendment 17B could interact with additional alternatives that are simultaneously being developed in Snapper Grouper Amendment 17A to manage fishing activity in areas with large concentrations of red snapper.

With regards to the recreational sector, **Alternative 4 (Preferred)** for speckled hind and warsaw grouper is expected to result in for-hire net operating revenue losses of up to $102,572 and losses to consumer surplus of up to $5,804,900. The black grouper, gag, red grouper, vermilion snapper, and black sea bass ACL and AM **Preferred Alternatives 2b, 4, and 5b** are expected to result in losses in for-hire net operating revenues of $860,173 and losses in consumer surplus of $21,188,241.

5.8 Determination of Significant Regulatory Action

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

6 Initial Regulatory Flexibility Analysis

6.1 Introduction

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

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

Additional information on the description of affected entities was presented in **Section 3.8** and additional information on the expected economic impacts of the proposed action was presented in **Sections 4.0** and **5.0**. These are included herein by reference.

6.2 Statement of Need for, Objectives of, and Legal Basis for the Rule

The purpose and need, issues, problems, and objectives of the proposed rule are presented in **Section 1.2** and are incorporated herein by reference. In summary, the purpose of this amendment includes: (1) specifying allowable catch limits (ACLs), allowable catch targets (ACTs), and accountability measures (AMs) for 9 species undergoing overfishing; (2) modifying management measures as needed to limit harvest to the ACL; (3) specifying allocation alternatives for golden tilefish; and (4) updating the framework procedure for specification of total allowable catch (TAC). The Magnuson-Stevens

Fishery Conservation and Management Act, as amended, provides the statutory basis for the proposed rule.

6.3 Identification of All Relevant Federal Rules Which May Duplicate, Overlap, or Conflict with the Proposed Rule

No duplicative, overlapping, or conflicting Federal rules have been identified. Previous amendments, whether already implemented or in the process of being implemented, have been considered in designing the various actions in this amendment.

6.4 Description and Estimate of the Number of Small Entities to Which the Proposed Rule will Apply

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

From 2003-2007, an average of 944 vessels per year were permitted to operate in the commercial snapper grouper fishery. Of these vessels, 749 held transferable permits and 195 held non-transferable permits. On average, 890 vessels landed 6.43 million pounds of snapper grouper species and 1.95 million pounds of other species on snapper grouper trips. Total dockside revenues from snapper grouper species stood at $13.81 million and from other species, at $2.30 million. Considering revenues from both snapper grouper and other species, the revenues per vessel would be $18,101. An average of 27 vessels per year harvested more than 50,000 pounds of snapper grouper species per year, generating at least, at an average price of $2.15 (2007 dollars) per pound, dockside revenues of $107,500. Commercial vessels that operate in the snapper grouper fishery may also operate in other fisheries, the revenues of which cannot be determined with available data and are not reflected in these totals.

Although a vessel that possesses a commercial snapper grouper permit can harvest any snapper grouper species, not all permitted vessels or vessels that landed snapper grouper landed all of the major species in this amendment. The following average number of vessels landed the subject species in 2003-2007: 292 for gag, 253 for vermilion snapper, 32 for speckled hind, 64 for golden tilefish, 160 for snowy grouper, 323 for black grouper, 237 for black sea bass, and 402 for red grouper. Combining revenues from snapper grouper and other species on the same trip, the average revenue per vessel for vessels landing the subject species would be $20,551 for gag, $28,454 for vermilion

snapper, $6,250 for speckled hind, $17,266 for golden tilefish, $7,186 for black grouper, $19,034 for black sea bass, and $17,164 for red grouper.

Based on revenue information, all commercial vessels that would be affected by the proposed action can be considered as small entities.

For the period 2003-2007, an average of 1,635 vessels were permitted to operate in the snapper grouper for-hire fishery, of which 82 are estimated to have operated as headboats. Within the total number of vessels, 227 also possessed a commercial snapper grouper permit and would be included in the summary information provided on the commercial sector. The for-hire fleet is comprised of charterboats, which charge a fee on a vessel basis, and headboats, which charge a fee on an individual angler (head) basis. The charterboat annual average gross revenue is estimated to range from approximately $62,000-$84,000 for Florida vessels, $73,000-$89,000 for North Carolina vessels, $68,000-$83,000 for Georgia vessels, and $32,000-$39,000 for South Carolina vessels. For headboats, the appropriate estimates are $170,000-$362,000 for Florida vessels, and $149,000-$317,000 for vessels in the other states.

Based on average revenue figures, all for-hire operations that would be affected by the proposed action can be considered as small entities.

Some fleet activity may exist in both the commercial and for-hire snapper grouper sectors, but the extent of such is unknown and all vessels are treated as independent entities in this analysis.

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

The proposed action would not introduce any changes to the current requirements for reporting, record-keeping, and other compliance requirements.

6.6 Substantial Number of Small Entities Criterion

The proposed action is expected to directly affect all Federally permitted commercial and for-hire vessels that operate in the South Atlantic snapper grouper fishery. All directly affected entities have been determined, for the purpose of this analysis, to be small entities. Therefore, it is determined that the proposed action will affect a substantial number of small entities.

6.7 Significant Economic Impact Criterion

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

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

All entities that are expected to be affected by the proposed rule are considered small entities, so the issue of disproportionality does not arise in the present case.

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

Some of the measures in this amendment would reduce harvest or implement measures designed to constrain harvests that would, in turn, reduce revenues and profits of affected small entities. However, some of the measures have the nature of delaying profit reductions to subsequent fishing seasons. In the following discussion, net operating revenue is considered equivalent to profit.

The measure to establish an ACL=0 landings for speckled hind and warsaw grouper, together with the ban on fishing for deepwater species co-occurring with these two species, is expected to reduce net operating revenues of commercial vessels by about $292 thousand. This measure is also expected to reduce net operating revenues of for-hire vessels by less than $102 thousand.

Establishing a 97% commercial and 3% recreational allocation of golden tilefish would tend to maintain the long-term and short-term proportional landings history of the commercial and recreational sectors, with relatively small short-term changes in net operating revenues of both commercial and for-hire vessels. At this allocation ratio, the corresponding commercial ACL (quota) would be 282,819 lbs gutted weight and the recreational allocation would be 1,578 fish (8,747 lbs gutted weight). The commercial quota with its attendant AM of fishery closure once the quota is met is expected to reduce net operating revenues of commercial vessels by about $8 thousand. The recreational allocation is expected to result in net revenue reductions of for-hire vessels by about $7 thousand. It is worth noting, however, that the reduction in net operating revenues of for-hire vessels is not immediate, since the recreational AM would shorten only the subsequent year's fishing season and only when recreational landings over a number of years (except for 2010) exceed the ACL.

Establishing a daily bag limit of 1 snowy grouper per vessel is expected to reduce net operating revenues of for-hire vessels by about $7 thousand. This reduction in net operating revenues is not immediate, since the recreational AM would shorten only the subsequent year's fishing season and only when recreational landings over a number of years (except for 2010) exceed the ACL.

The combined measure to retain the commercial ACL for gag of 352,940 lbs gutted weight, to establish an aggregate commercial ACL for gag, red grouper, and black grouper of 662,403 lbs gutted weight, and to close the fishery when the gag ACL or the aggregate ACL is reached is expected to reduce net operating revenues of commercial vessels by about $103 thousand. On the recreational side, the combined measure to retain the recreational ACL for gag of 340,060 lbs gutted weight and to establish an aggregate ACL for gag, red grouper, and black grouper of 648,663 lbs gutted weight is not expected to affect the net operating revenues of for-hire vessels, since these are the expected landings from implementation of previous amendments, notably Snapper Grouper Amendment 16. There is a possibility that the recreational AM of prohibiting the harvest and retention of an overfished species when the sector ACL is projected to be met would have negative impacts on for-hire vessels fishing for black sea bass. Under this AM, for-hire vessels could lose about $860 thousand in net revenues. This reduction is likely to be an overestimate for at least two reasons. First, the method used in estimating the economic effects on the recreational sector likely overestimated the number of headboat angler trips affected by the measure. Second, recreational landings of black sea bass have been trending downwards due to the implementation of more restrictive measures provided in previous amendments, so using average landings over 2005-2008 inflated the amount of landings for comparison with the ACL.

Updating the framework procedure for specification of TAC has no direct effects on the net operating revenues of commercial and for-hire vessels.

The short-term reductions in the net revenues of commercial vessels due to the proposed action may be considered relatively small. On the recreational side, only the AM for black sea bass may be considered to have relatively substantial economic effects on for-hire vessels.

6.8 Description of Significant Alternatives

Details of the various alternatives are provided in **Section 2.0** and are included herein by reference. The following describes the proposed action and significant alternatives to the proposed action.

The proposed action consists of the following:

1. Establish an ACL = 0 landings for speckled hind and warsaw grouper and prohibit all fishing for possession, and retention of speckled hind and warsaw grouper; prohibit all fishing for, possession, and retention of snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper beyond a depth of 240 feet (40 fathoms; 73 m).

2. Establish a 97% commercial and 3% recreational allocation of golden tilefish.

3. Establish the commercial ACL (quota) and recreational ACL for golden tilefish at the F_{OY} level. The commercial quota, based upon the selected allocation, would be 282,819 lbs gutted weight. The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is projected to be met. All purchase and sale is prohibited when the quota is projected to be met. The recreational ACL, specified in numbers of fish and based on the selected allocation, would be 1,578 fish. The recreational AM is specified in the following manner. If the ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACL for the following fishing year. Compare recreational ACL with recreational landings using only 2010 landings for 2010, average 2010 and 2011 landings for 2011, and use the most recent three-year running average landings for 2012 and beyond.

4. Establish a recreational daily bag limit of 1 snowy grouper *per vessel*. The AM is specified in the following manner. If the ACL is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACL for the following fishing year. Compare recreational ACL with recreational landings using only 2010 landings for 2010, average 2010 and 2011 landings for 2011, and use the most recent three-year running average landings for 2012 and beyond.

5. Retain the current commercial ACL for gag of 353,940 lbs gutted weight and the commercial AM to prohibit commercial harvest of shallow water groupers when the ACL is projected to be met. Retain the current recreational ACL of 340,060 lbs gutted weight for gag. In addition, establish an aggregate ACL for gag, black grouper, and red grouper of 662,403 lbs gutted weight (commercial) and 648,663 lbs gutted weight (recreational). Prohibit the commercial possession of shallow water groupers when the gag ACL or the aggregate gag, black grouper, and red grouper ACL is projected to be met.

   Implement recreational AMs for black grouper, black sea bass, gag, red grouper, and vermilion snapper in the following manner. If at least one of the species *is overfished* and the sector ACL is projected to be met, prohibit the harvest and retention of the species or species group. If the ACL is exceeded, independent of stock status, the Regional Administrator shall publish a notice to reduce the sector ACL in the following year by the amount of the overage. Compare recreational ACL with recreational landings using only 2010 landings for 2010, average 2010 and 2011 landings for 2011, and use the most recent three-year running average landings for 2012 and beyond.

6. Update the framework procedure for specification of Total Allowable Catch (TAC) for the Snapper Grouper FMP to incorporate ACLs, ACTs, and AMs. Such modifications would be based upon new scientific information indicating such modifications are prudent.

Five alternatives, including the proposed action, were considered for establishing an ACL for speckled hind and warsaw grouper. Alternative 1, the no action alternative, would not conform to the requirements of the Reauthorized Magnuson-Stevens Act to establish an ACL for the subject species. Alternative 2 would establish an ACL=0 for speckled hind and warsaw grouper and prohibit their harvest and retention but would not close any areas to fishing for deepwater species that co-occur with these two species. Although this alternative would have smaller negative economic effects on small entities than the proposed action, it would not be sufficient to end overfishing of speckled hind and warsaw grouper due to discard mortality from fishing for other co-occurring deepwater species. Alternative 3 is the same as the proposed action, except that the fishing prohibition for other co-occurring deepwater species would apply to all depths. In this case, this alternative would result in greater negative economic effects on small entities than the proposed action. Alternative 5 is similar to the proposed action, except that the prohibition on fishing for other co-occurring deepwater species would be beyond 300 feet (92 m.). With smaller closed areas, this alternative would result in slightly smaller negative economic effects on small entities. On the other hand, the protection this alternative provides on adult speckled hind and warsaw grouper would be less than that of the proposed action. The possibility of continued overfishing for the subject species may still occur under this alternative.

Four alternatives, including the proposed action, were considered for the golden tilefish allocation. Alternative 1, the status quo alternative, would not establish a commercial/recreational allocation for golden tilefish. Without a defined sector allocation, it would be difficult to define sector ACL and to take corrective actions should the sector ACLs or overall ACL be exceeded. This would then weaken the ability of fishery managers to effectively manage the stock. Alternative 2 would establish a 96% commercial and 4% recreational allocation. This allocation is very close to that provided under the proposed action, and thus its economic effects would only minimally differ from those of the proposed action. This alternative uses only the most current landings records (2006-2008) while the proposed action uses both the long-run (1986-2008) and short-run (2006-2008) landings history. Alternative 4 would establish a 50% commercial and 50% recreational allocation. This alternative would create significant disruptions to the commercial sector operations, and thus would impose relatively large costs to this sector. The recreational sector would stand to gain from this allocation, but whether or not the gains to the recreational sector would outweigh losses to the commercial sector cannot be determined. At least in the short-run and given the current bag limit of one fish per person per day, benefits to the recreational sector would be relatively small and would not compensate for the losses in the commercial sector. Thus, the expected net economic effects of this alternative in the short run would be negative.

Five alternatives, including the proposed action, were considered for the golden tilefish ACL and AM. Alternative 1, the status quo alternative, would retain the current ACL for the commercial sector based on F_{MSY} and would not establish ACL for the recreational sector. The current AM, which would close all fishing for golden tilefish once the commercial ACL is reached, would serve as AM for both the commercial and recreational sectors. This alternative would not add any more fishery restrictions and

economic losses to the fishery participants, but it would be less conservative than the proposed action in rebuilding the stock. In addition, it would provide less flexibility in implementing sector-specific AM. Alternative 3 would establish a single commercial and recreational ACL using the total of the commercial ACL as the F_{OY} level and the recreational allowable harvest at the OY level. The AM would prohibit commercial and recreational harvest when the ACL is projected to be met. This alternative would result in about the same economic losses to the commercial sector as the proposed action. There is some potential for this alternative to result in smaller economic losses to the recreational sector than the proposed action, especially if only the commercial landings were effectively monitored for then the recreational sector would remain open longer. But to the extent that the AM under this alternative would be imposed in-season while that of the proposed action only in subsequent years, the economic effects of this alternative over time could very well exceed those of the proposed action. Alternative 4 would establish a recreational AM of one golden tilefish per vessel per day when the single ACL (sum of the commercial ACL at the F_{OY} level and recreational harvest at the OY level) is projected to be met. This alternative offers potential for smaller economic losses to the recreational sector than the proposed action by maintaining a year-round recreational fishery although at very limited bag limit. But since this alternative requires in-season adjustments as against subsequent-year adjustments under the proposed action, the resulting economic losses over time due to this alternative could exceed those of the proposed action. Alternative 5 would establish a commercial and recreational ACL based on the yield at F_{OY} for the commercial fishery. The AM for both sectors would be to prohibit harvest, possession, and retention when commercial landings exceed the ACL. This alternative would have the same economic effects on the commercial sector as the proposed action, but losses to the recreational sector would likely exceed those of the proposed action.

Four alternatives, including the proposed action, were considered for snowy grouper ACL and AM. Alternative 1, the status quo alternative, would retain the commercial ACL (quota) of 82,900 lbs gutted weight based on the current TAC of 87,254 lbs gutted weight; would retain the commercial AM which is to prohibit harvest, possession, and retention of snowy grouper when the quota is met; would maintain the recreational ACL of 523 fish; and, would not implement a recreational AM. This alternative would not add any restrictions on both the commercial and recreational sectors, but the absence of an AM for the recreational sector would make it difficult to implement sector-specific adjustments. Alternative 3 would establish a single commercial/recreational ACL of 87,254 lbs gutted weight and the AM for both sectors would be a closure of the fishery when the ACL is projected to be met. This alternative may result in slightly better economic effects on the commercial sector than the proposed action or the no action alternative, but this slight advantage of the commercial sector would come at the expense of the recreational sector. In effect, this alternative would have slightly larger short-run economic losses on the recreational sector than the proposed action. In addition, this alternative would not allow for sector-specific adjustments should ACL overages occur. Alternative 4 would establish a recreational AM of one fish per vessel per day when the commercial quota is projected to be met. The commercial AM would be a fishery closure when the quota is met. This alternative would have about similar economic effects on the

commercial sector as the no action alternative and slightly lower short-run negative effects on the recreational sector than the proposed action. But unlike the proposed action, this alternative could result in overages in the recreational sector without a possible compensating adjustment in succeeding years, thereby potentially resulting in less protection to the stock.

Five alternatives, two of which comprise the proposed action, were considered for the black grouper, black sea bass, gag, red grouper, and vermilion snapper ACL, AM, and ACT. The alternative for establishing commercial and recreational ACLs consisted of two sub-alternatives, one of which is the proposed action (Alternative 2b). The ACT alternative for the recreational sector consisted of three sub-alternatives, none of which was selected as the proposed action. The AM alternative for the recreational sector consisted of three sub-alternatives, one of which is the proposed action (Alternative 5b). Alternative 1, the status quo alternative, would retain the commercial and recreational ACL for black sea bass, gag, and vermilion snapper and would not establish a commercial and recreational ACL for black grouper and red grouper. This alternative would not comply with the requirements of the Reauthorized Magnuson-Stevens Act. Alternative 2a (only alternative to the proposed action on commercial and recreational ACLs) would establish black grouper commercial and recreational ACLs of 86,886 lbs gutted weight and 31,863 lbs gutted weight, respectively. It would also establish red grouper commercial and recreational ACLs of 221,577 lbs gutted weight and 276,740 lbs gutted weight, respectively. This alternative would have about similar biological effects as the proposed action. However, it could result in slightly worse economic outcome than the proposed action as it would allow less flexibility to small entities in adjusting their fishing operations with respect to gag, black grouper, and red grouper. Alternative 5 on recreational AM consisted of two sub-alternatives. Sub-Alternative 5a would require the Regional Administrator to reduce the length of the following fishing year if the ACL were exceeded in the current year. Although this alternative would provide less negative effects in the short-run, it would provide less biological benefits than the proposed action, particularly with respect to overfished species, so as to delay farther the generation of economic benefits from the fishery. Sub-Alternative 5cwould close the fishery if the sector ACT were exceeded for an overfished species or species group and would require the Regional Administrator to reduce the sector ACT the following year. By not selecting any ACT, this alternative would not be a viable alternative. If ACTs were selected, this alternative would likely result in larger short-run economic losses than the proposed alternative.

Two alternatives, including the proposed action, were considered for updating the framework procedure for specification of TAC for the Snapper Grouper FMP to incorporate ACLs, ACTs, and AMs. The only alternative to the proposed action, the no action alternative, would tend to delay the implementation or modification of ACLs, ACTs, and AMs when new scientific information becomes available. It would also tend to incur more administrative costs than the proposed action.

7 Fishery Impact Statement and Social Impact Assessment

7.1 Fishery Impact Statement

Biological impacts of establishing ACLs, AMs, and implementing management measures to maintain harvest at or below the ACLs would generally be positive. Setting strategic ACLs intended to end overfishing and prevent future overfishing of speckled hind, warsaw grouper, golden tilefish, black sea bass, red grouper, black grouper, vermilion snapper, gag, and snowy grouper is biologically advantageous. Rebuilding overfished stocks will promote balanced predator-prey relationships, restore natural sex ratios, and encourage overall ecosystem health and stock abundance. Implementing AMs would also benefit the biological environment by providing incentives to fish within sustainable parameters and providing a mechanism for correcting ACL overages should they occur. Modifying the current Framework Procedure to include ACL, ACTs, and AMs will also be biologically beneficial since management measures and harvest levels could easily be adjusted when new scientific information becomes available. In the long-term, establishing ACLs and AMs would also benefit fishery participants by ensuring appropriate harvest levels are enforced and sustainable biomass levels of snapper grouper are maintained.

The preferred alternatives are expected to improve the long-term biological health of the fishery and thereby improve long-term economic benefits for the fishermen. The impact to the commercial fishery from the preferred alternatives for speckled, warsaw grouper, golden tilefish, red grouper, and black grouper discussed above were analyzed jointly. Average annual net operating revenues to boat owners and crew after deducting trip costs is expected to decline from $8.78 million to approximately $8.38 million, a difference of $0.40 million or a 4.6% average annual short-term economic loss. However, impacts differ by gear and state of landing. Fishermen using vertical line are expected to incur earnings losses of 4.6% compared to losses of 13.2% to fishermen using bottom longline gear. Fishermen from North Carolina, South Carolina, and the Florida Keys would incur the greatest losses. Recreational impacts from the speckled hind and warsaw preferred alternative was not able to be quantified due to a lack of data. Recreational impacts from the golden tilefish ACL and AM would result in a predicted closure in mid-July. The golden tilefish allocation preferred alternative offers the commercial fishery the greatest opportunities to generate economic benefits and the recreational fishery, the least. The impacts to the recreational sector of the snowy grouper limit of one fish per vessel per day would have relatively small economic impacts but is predicted to result in an early closure compared to the status quo. In general, establishment of AMs have beneficial long-term economic impacts if commercial and recreational landings can be accurately tracked. The geographic distribution of economic impacts primarily reflects the location of fishing activities for the species. The recreational AM for black sea bass is expected to create short-term annual losses of around $860,000 in for-hire net revenues. While no direct economic effects are expected, long-term economic benefits are expected from modifications to the framework procedures.

Although some short-term adverse social consequences would be expected to result where harvests will be reduced or closures are triggered by AMs, the proposed measures in this amendment would be expected to result in positive long-term social benefits. These measures, if implemented, are expected to result in improved likelihood of species recovery, where appropriate, and protection, which should provide better safeguards for producing and maintaining a stable resource capable of supporting steady and sustainable social benefits. These actions should allow corrective action, when necessary, to be implemented in a more timely and efficient manner, thereby reducing their severity and the magnitude of associated short term adverse social effects.

Impacts on the administrative environment resulting from the specification of ACLs and defining allocations for golden tilefish would be minimal. Specifying AMs is not expected to incur negative administrative impacts; however, if those AMs are triggered and some action is required such as a fishery closure or an ACL payback, an additional administrative burden would exist for the implementation of the appropriate AM. Such administrative tasks and expenditures may take the form of issuing fishery bulletins to alert fishery participants of changes to harvest levels or fishing seasons, and tracking percentages of ACLs harvested throughout the fishing season. Modifying the current framework procedure to incorporate ACLs, ACTs, and AMs would decrease administrative burdens in the long-term since the framework would make it possible to adjust ACLs, ACTs, and AMs, through regulatory amendments rather than through full FMP amendments. Using regulatory amendments in this way would save time in reacting to new scientific information, and would reduce the overall administrative burden and associated expense.

7.2 Social Impact Assessment

7.2.1 Introduction

Mandates to conduct Social Impact Assessments (SIA) come from both the National Environmental Policy Act (NEPA) and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). NEPA requires Federal agencies to consider the interactions of natural and human environments by using a "...systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences...in planning and decision-making [NEPA section 102 (2) (a)]. Under the Council on Environmental Quality's (CEQ 1986) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, a clarification of the terms "human environment" expanded the interpretation to include the relationship of people with their natural and physical environment (40 CFR 1508.14). Moreover, agencies need to address the aesthetic, historic, cultural, economic, social, or health effects which may be direct, indirect or cumulative

(Interorganizational Committee on Guidelines and Principles for Social Impact Assessment 1994).

Under the Magnuson-Stevens Act, fishery management plans (FMPs) must "..achieve and maintain, on a continuing basis, the optimum yield from each fishery" [Magnuson-Stevens Act section 2 (b) (4)]. When considering "…a system for limiting access to the fishery in order to achieve optimum yield.." the Secretary of Commerce and Regional Fishery Management Councils are to consider both the social and economic impacts of the system [Magnuson-Stevens Act section 303 (b) (6)]. Recent amendments to the Magnuson-Stevens Act require that FMPs address the impacts of any management measures on the participants in the affected fishery and those participants in other fisheries that may be affected directly or indirectly through the inclusion of a fishery impact statement [Magnuson-Stevens Act section 303 (a) (9)]. National Standard 8, requires that FMPs must consider the impacts upon fishing communities to assure their sustained participation and minimize adverse economic impacts upon those communities [Magnuson-Stevens Act section 301 (a) (8)].

7.2.2 Problems and Methods

Social impacts are generally the consequences to human populations that follow from some type of public or private action. Those consequences may include alterations to "...the ways in which people live, work or play, relate to one another, organize to meet their needs and generally cope as members of a society…" (Interorganizational Committee on Guidelines and Principles for Social Impact Assessment 1994:1). Social impact analyses can be used to determine possible consequences management actions may have on fishing dependent communities. In order to do a full social impact analysis it is necessary to identify community participants who depend upon the fisheries in that area and to identify the amount of dependency they have upon a given fishery. Further it is necessary to understand the other opportunities for employment that exist within the community should fishery management measures become so restrictive that participants must switch their focus to other fisheries or other jobs outside of the fishing industry. Public hearings and scoping meetings may provide input from those concerned with a particular action, but they do not constitute a full overview of those that depend on the fishing industry.

In attempting to assess the social impacts of the proposed amendment it must be noted that there is not enough data on all participants who are involved with the snapper grouper fishery at the community level to do a complete overview of the fishery; therefore, analyses cannot predict all social impacts. However, secondary data such as landings data, license data, permits data, and information on communities such as Census data, can help to describe the communities involved in the snapper-grouper fishery in the South Atlantic.

Today, more fisheries are managed by quotas and/or have restrictions on the number of participants. This limits the other opportunities fishermen who fish for species in the snapper-grouper complex to target other species to make up for reduced harvests of the snapper-grouper species.

Based on an analysis of secondary data, there are not any communities in the South Atlantic region that are completely dependent on the snapper grouper fisheries, although several are heavily involved with the commercial or recreational snapper-grouper fishery. Any reduction in harvest has the potential to put fishermen and fishing dependent businesses out of business. Some recreational and commercial fishermen may decide it is not worth fishing for very limited bag limits, reduced TACs, or for only a few species. Decisions on whether to stay in the fishery or to leave for another type of employment often depends on the circumstances of the individual such as whether or not they own their fishing boat, how much longer they intended to fish before retirement, if there is other family income, etc. At this time, there is insufficient information on fishermen to be able to fully describe what they may do with reduced catches, shorter fishing seasons, and/or closed areas.

In the future, fishermen, fishing dependent businesses, and communities involved in the snapper grouper fisheries will benefit when overfishing is stopped and the fishery is rebuilt. However, for the short-term, the closing of specified areas, seasonal closures, reduced catch limits, and other measures that are necessary to stop overfishing and rebuild stocks, will all have negative impacts on those involved in the fishery. The average age of commercial fishermen is increasing, and fewer young people are becoming commercial fishermen. A fishery that is rebuilt in 15, 20, or even 25 years may be of no help to fishermen who will be impacted now by new regulations because they may be too old to fish when the fishery is rebuilt. Because fewer young people are choosing to fish, there may be the possibility that there may not be many commercial fishermen to harvest quotas once the fishery is rebuilt.

Communities that depend on the fishing industry throughout the South Atlantic are facing increasing challenges due to increased regulations that reduce catch for both the recreational and commercial fishing sector. If commercial catches are reduced, there can be a reduction in fish houses and processors, or a loss of jobs in the processing sector. Some fishermen may decide they can no longer make a living in the fishing industry and leave the industry for other jobs. Overall, fewer young people are becoming fishermen due to the difficulty of making a living fishing. If the harvest levels are reduced for recreational sector, this will have a negative impact on charter and party boat operators, private boat owners, and businesses such as bait shops, marinas, hotels, and restaurants that cater to recreational fishermen.

Communities are also facing increasing challenges due to development and gentrification. As more waterfront property is developed for non-fishing uses such as locations for condominiums, hotels, restaurants, etc., fishing related businesses are in competition over land. Development often increases taxes which make it difficult for fishing docks, processors, and other businesses to stay near the water. In the last few

decades more fishermen have had to move inland due to the rising cost of housing and taxes for water front property. This has changed the dynamics of some areas that were once built around the fishing industry.

Profiles of the communities expected to be affected by the actions in this proposed amendment are provided in **Section 3.8.3**, while a discussion of the expected social effects of each alternative considered is provided in **Section 4**.

7.2.3 Environmental Justice Considerations

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

Persons employed in the snapper-grouper fishery and associated businesses and communities along the South Atlantic coast would be expected to be affected by this proposed action. 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. County level data, however, for the communities profiled in Section 3.8.3 have been assessed to examine potential EJ concerns. Because this proposed action would be expected to affect fishermen and associated industries in numerous 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 such that, 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 2000 was used Estimates of the state minority and poverty rates, associated thresholds, and community rates are provided in Table 7-1.

Based on available demographic information, only the poverty rate for Beaufort, North Carolina suggests potential EJ concern, with a poverty rate of 16.6%, which exceeds the state threshold of 14.76%. This single instance might suggest potential EJ concerns are minimal. As noted above, however, additional communities beyond those profiled would be expected to be affected by the actions in this proposed amendment. Because these communities have not been profiled, the absence of additional potential EJ concerns

cannot be assumed and the total number of communities that exceed the thresholds in unknown.

However, 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, no EJ issues have been identified or are expected to arise as a result of this proposed amendment. No negative environmental consequences are expected to accrue to this proposed amendment. Although some short-term adverse social and economic consequences may accrue to fishermen in the snapper-grouper fishery and associated industries and communities due to possible reduction of expenditures and revenues associated with changes in fishing behavior and harvest levels, the environmental consequences of this proposed amendment are expected to be positive. The actions in this proposed amendment are expected to protect and ensure the sustainability and health of the respective species. Protection of these species would be expected to preserve the environmental benefits these species contribute to the marine environment and the general health and condition of this environment. These measures are also not expected to result in increased risk of exposure of affected individuals to adverse health hazards.

Table 7-1. Environmental justice thresholds (percentages).

State	Community	Minority Rate	Minority Threshold*	Poverty Rate	Poverty Threshold*
Florida		34.60	41.52	12.50	15.00
	Cape Canaveral	8.10		11.60	
	Marathon	26.70		14.20	
Georgia		37.40	44.88	13.00	15.60
	Townsend**	39.10		14.60	
South Carolina		33.90	40.68	14.10	16.92
	Little River	9.10		7.50	
North Carolina		29.80	35.76	12.30	14.76
	Atlantic City	2.60		7.30	
	Beaufort	25.40		16.60	
	Hatteras Village	6.60		10.00	
	Morehead City	19.20		14.60	
	Sneads Ferry	9.70		13.50	
	Wanchese	3.30		8.10	
*Calculated as 1.2 times the state rate.					
**Values are for entire McIntosh County.					

Source: 2000 U.S. Census data.

8 Other Applicable Law

8.1 Administrative Procedure Act

All federal rulemaking is governed under the provisions of the Administrative Procedure 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, NOAA Fisheries Service 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 waiting period from the time a final rule is published until it takes effect.

8.2 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 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 **Section 4.0**, the Council has concluded this amendment would improve federal management of snapper grouper species.

8.3 Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 U.S.C. Section 1531 et seq.) requires that federal agencies 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.

NOAA Fisheries Service completed a biological opinion in 2006 evaluating the impacts of the continued authorization of the South Atlantic snapper grouper fishery under the snapper grouper FMP and Amendment 13C (NMFS 2006) on ESA-listed species (see

Section 3.5). The opinion stated the fishery was not likely to adversely affect northern right whale critical habitat, seabirds, or marine mammals (see NMFS 2006 for discussion on these species). However, the opinion did state that the snapper grouper fishery would adversely affect sea turtles and smalltooth sawfish, but would not jeopardize their continued existence. An incidental take statement was issued for green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles, as well as smalltooth sawfish. Reasonable and prudent measures to minimize the impact of these incidental takes were specified, along with terms and conditions to implement them.

NOAA Fisheries Service conducted an informal ESA section 7 consultation on July 9, 2007, evaluating the impacts of the South Atlantic snapper grouper fishery on ESA-listed *Acropora* species. The consultation concluded that the continued operation of the snapper grouper fishery was not likely to adversely affect newly listed *Acropora* coral species. On November 26, 2008, a final rule designating *Acropora* critical habitat was published in the *Federal Register*. A memo dated December 2, 2008, evaluated the effects of the continued authorization of the South Atlantic snapper grouper fishery on *Acropora* critical habitat pursuant to ESA section 7. The evaluation concluded the proposed actions are not likely to adversely affect *Acropora* critical habitat.

8.4 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. The affected states have been closely involved in developing the proposed management measures and the principal state officials responsible for fisheries management in their respective states have not expressed federalism related opposition to the proposed action.

8.5 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.

8.6 Executive Order 12898: Environmental Justice

This Executive Order mandates that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions. Federal agency responsibilities under this Executive Order include conducting their programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons from participation in, denying persons the benefit of, or subjecting persons to discrimination under, such programs policies, and activities, because of their race, color, or national origin. Furthermore, each federal agency responsibility set forth under this Executive Order shall apply equally to Native American programs.

Specifically, federal agencies shall, to the maximum extent practicable; conduct human health and environmental research and analysis; collect human health and environmental data; collect, maintain and analyze information on the consumption patterns of those who principally rely on fish and/or wildlife for subsistence; allow for public participation and access to information relating to the incorporation of environmental justice principals in federal agency programs or policies; and share information and eliminate unnecessary duplication of efforts through the use of existing data systems and cooperative agreements among Federal agencies and with State, local, and tribal governments.

The Council conducted a series of scoping meetings for this amendment in which the public was invited to provide input on actions contained therein. A summary of the scoping meetings can be found in **Appendix K** of this document. Comments received were considered during the development of Amendment 17B, and no environmental justice issues were raised during the scoping process. No Native American programs would be affected by actions contained within this amendment; therefore, no tribal consultation has been initiated.

Section 3.8 describes several areas in North Carolina, South Carolina, Georgia, and Florida where South Atlantic snapper grouper fisheries have a local presence. These communities were identified as key communities involved in the South Atlantic snapper grouper fishery based on fishing permit and employment data. The demographic information reported for these communities were derived from census data. Although the Census Bureau does not supply race or income data at the community level, such data are available for each county in which the fishing communities exist. Based on 2005 Census data, none of the counties within which any of the subject fishing communities is located

has a disproportionately high poverty rate[9], or minority population[10]. The proposed actions would be applied to all participants in the fishery, regardless of their race, color, national origin, or income level, and as a result are not expected to result in adverse or disproportionate environmental or public health impacts. Comments received during scoping did not indicate proposed actions are expected to affect any existing subsistence consumption patterns. Therefore, no environmental justice issues are anticipated and no modifications to any proposed actions have been made to address environmental justice issues.

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 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.

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.

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[9] Following the Office of Management and Budget's (OMB) Statistical Policy Directive 14 if a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps) (U.S. Census, 2008).

[10] A minority population is one either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (U.S. Census, 2008).

Previous snapper grouper amendments, including Amendment 13A (2003), eliminated all potential adverse impacts to *Oculina* coral in the *Oculina* Banks HAPC and Experimental Closed Area that are associated with bottom fishing gear and fulfills the intentions of E.O. 13089. The use of bottom trawls, bottom longlines, dredges, fish traps, and fish pots is currently prohibited within the *Oculina* Banks HAPC and Experimental Closed Area and that prohibition would not be affected by the proposed actions.

The Comprehensive Ecosystem Based Amendment 1 (CE-BA 1) (SAFMC 2009)) specifies boundaries and management measures for proposed deepwater coral habitat areas of particular concern (HAPCs). A series of public hearings for the amendment were held January and February 2009. The Council submitted the draft Environmental Impact Statement (DEIS) for CE-BA 1 to NOAA Fisheries Service in January 2009. CE-BA 1 is currently undergoing formal review by the Secretary of Commerce.

8.9 Executive Order 13158: Marine Protected Areas

E.O. 13158 was signed on May 26, 2000 to strengthen 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 South Atlantic Council developed Snapper Grouper Amendment 14 to establish a series of deepwater marine protected areas in the South Atlantic EEZ. The amendment was approved by the Council during its June 2007 meeting and submitted to NOAA Fisheries Service for approval by the Secretary of Commerce on July 18, 2007. Amendment 14 was implemented on February 12, 2009.

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.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; development and implementation of take-reduction plans for stocks that may be reduced

or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries; and studies of pinniped-fishery interactions. The MMPA requires a commercial fishery to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; and Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities. To legally fish in a Category I and/or II fishery, a fisherman must obtain a marine mammal authorization certificate by registering with the Marine Mammal Authorization Program (50 CFR 229.4), the must accommodate an observer if requested (50 CFR 229.7(c)) and comply with any applicable take reduction plans.

The commercial hook-and-line components of the South Atlantic snapper grouper fishery (i.e., bottom longline, bandit gear, and handline) are listed as part of a Category III fishery (74 FR 27739; June 11, 2009) because there have been no documented interactions between these gears and marine mammals. The black sea bass pot component of the South Atlantic snapper grouper fishery is part of the Atlantic mixed species trap/pot fishery, a Category II fishery, in the 2010 proposed LOF (74 FR 27739; June 11, 200973 FR 73032; December 1, 2008)). The Atlantic mixed species trap/pot fishery designation was created in 2003 (68 FR 41725, July 15, 2003), by combining several separately listed trap/pot fisheries into a single group. This group was designated Category II as a precaution because of known interactions between marine mammals and gears similar to those included in this group. Prior to this consolidation, the black sea bass pot fishery in the South Atlantic was a part of the "U.S. Mid-Atlantic and Southeast U.S. Atlantic Black Sea Bass Trap/Pot" fishery (Category III). There has never been a documented interaction between marine mammals and black sea bass trap/pot gear in the South Atlantic. The actions in Snapper Grouper Amendment 17B are not expected to negatively impact the provisions of the MMPA.

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 signatories, 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 the U.S. government.

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.

A 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.

8.12 National Environmental Policy Act

Concerned with the degree of damages incurred by human activity on the sensitive ecological environment in the United States, Congress passed, and Richard Nixon signed into law, the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. §§ 4321 *et seq.* NEPA sets the national environmental policy by providing a mandate and framework for federal agencies to consider all reasonably foreseeable environmental effects of their actions. In addition, it requires disclosure of information regarding the environmental impacts of any federal or federally funded action to public officials and citizens before decisions are made and actions taken. The analyses and results are presented to the public and other agencies through the development of NEPA documentation. The Final Environmental Impact Statement (FEIS) integrated into Snapper Grouper Amendment 17B serves as the documentation to satisfy the requirements of NEPA.

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 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 EEZ are Gray's Reef and Florida Keys National Marine Sanctuaries. The Florida Keys National Marine Sanctuary represents the bulk of the ESA-listed *Acropora* species' range in the South Atlantic region.

8.14 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to control paperwork requirements imposed on the public by the federal government. The authority to manage information collection and record keeping requirements is vested with the Director of the Office of Management and Budget. This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.

The Council is not proposing, in this amendment, measures that would involve increased paperwork and consideration under this Act.

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.

8.16 Small Business Act

Enacted in 1953, the Small Business Act (SBA) requires that agencies assist and protect small-business interests to the extent possible to preserve free competitive enterprise. The IRFA discussed in Section 6 of this document shows that Snapper Grouper Amendment 17B is in compliance with the SBA.

8.17 Public Law 99-659: Vessel Safety

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

No vessel would be forced to participate in the snapper grouper fishery 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 people participating neither in the fishery nor 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.

8.18 Essential Fish Habitat

The amended Magnuson-Stevens Act included a new habitat conservations provision known as EFH that requires each existing and any new FMPs to describe and identify EFH for each federally managed species, minimize to the extent practicable impacts from fishing activities on EFH that are more than minimal and not temporary in nature, and identify other actions to encourage the conservation and enhancement of that EFH. To address these requirements the Council has, under separate action, approved a Habitat Plan (SAFMC 1998e) and a Comprehensive EFH Amendment/EIS (SAFMC 1998c) to address the new EFH requirements contained within the Magnuson-Stevens Act. Section 305(b)(2) requires federal agencies to obtain a consultation for any action that may adversely affect EFH. An EFH consultation was completed and documented in a memo to the file dated January 15, 2010. The Consultation concluded the actions considered in Snapper Grouper Amendment 17B would not adversely affect EFH.

9 List of Preparers

Name	Title	Agency	Division	Location
Jack McGovern	Fishery Scientist	NMFS	SF	SERO
David Dale	EFH Specialist	NMFS	HC	SERO
Rick DeVictor	Environmental Impact Scientist	SAFMC	N/A	SAFMC
Andy Herndon	Biologist	NMFS	PR	SERO
Stephen Holiman	Economist	NMFS	SF	SERO
David Keys	Regional NEPA Coordinator	NMFS	SF	SERO
Tony Lamberte	Economist	NMFS	SF	SERO
Palma Ingles	Anthropologist	NMFS	SF	SERO
Amanda Frick	Geographer	NMFS	PR	SERO
Nikhil Mehta	Fishery Biologist	NMFS	SF	SERO
John Vondruska	Economist	NMFS	SF	SERO
Roger Pugliese	Senior Fishery Biologist	SAFMC	N/A	SAFMC
Kate Quigley	Economist	SAFMC	N/A	SAFMC
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Jim Waters	Economist	NMFS	Economics	SEFSC
Kate Michie	Fishery Management Plan Coordinator	NMFS	SF	SERO
Gregg Waugh	Deputy Director	SAFMC	N/A	SAFMC
Nick Farmer	Data Analyst	NMFS	SF	SERO

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

<u>Amendment 17B Interdisciplinary Team Members</u>

Roy Crabtree – SERO Regional Administrator
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John Carmichael – SAFMC Scientific and Statistical Committee Staff
Kate Quigley – SAFMC Economist
Myra Brower – SAFMC staff
Roger Pugliese – SAFMC staff
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10 List of Agencies, Organizations, and Persons To Whom Copies of the Statement Are Sent

Responsible Agency

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List of Agencies, Organizations, and Persons Consulted

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

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Appendix A. Alternatives the Council considered but eliminated from detailed study, and a brief discussion of the reasons for their elimination.

This section describes alternatives to the proposed actions that the Council considered in developing this document, but decided not to pursue. The description of each alternative is followed by a summary statement of why it was eliminated from more detailed summary.

Rejected Alternatives 1-4. Modify the Council's current definition of Optimum Yield (OY) for nine species undergoing overfishing (Table 1).

Table 1. OY alternatives for nine species undergoing overfishing.

Alternatives	OY equation	F_{OY} equals
Alternative 1 (Status Quo).	For black sea bass, golden tilefish, snowy grouper, vermilion snapper, and gag, OY equals the yield produced by F_{OY}. F_{OY} equals (75%)(F_{MSY}). 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}. F_{OY} equals (75%)(F_{MSY}). For the other species, OY equals the yield produced by F_{OY}. $F_{40\%SPR}$ is used as the F_{OY} proxy.	Either (75%)(F_{MSY}) or $F_{40\%SPR}$ depending on the species.
Alternative 2.	OY equals the yield produced by $F_{OY.}$ 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}.	(55%)(F_{MSY})
Alternative 3.		(65%)(F_{MSY})
Alternative 4.	OY equals the sum of the sector ACTs.	_____pounds (will be added after the Committee & Council specify ACTs.)

<u>Rationale for elimination</u>: The Council had considered this action because of concern that the ACL and ACT could be at or below the ABC. The Council removed the action to specify the definition of OY at their December2008 meeting since the SSC and Council had recently established definitions of OY for most of the species based on recent SEDAR assessments. The Council indicated OY has been specified as yield at 75%F_{MSY} for snowy grouper, black sea bass, and red porgy in Amendment 15A. Amendment 16 defined OY as the yield at 75%F_{MSY} for gag and vermilion snapper. Amendment 15B specified OY for golden tilefish as the yield at 75%F_{MSY}. OY is not currently being considered for red grouper and black grouper as these species will be assessed beginning in June 2009 and information to determine OY will be available in early 2010. The Council indicated they may want to consider this action in the future after ACLs and ACTs had been established for the nine species.

Rejected Alternatives 5 and 6. Modify the Council's current definition of minimum stock size threshold (MSST) for nine species undergoing overfishing (Table 2).

Table 2. MSST alternatives for ten species undergoing overfishing.

Alternatives	MSST equation
Alternative 5.	MSST equals $SSB_{MSY}(0.5)$.
Alternative 6.	MSST equals $SSB_{MSY}(0.75)$.

Rationale for elimination: The Council has modified the definition of MSST for snowy grouper and golden tilefish over concern that recruitment fluctuations could cause a reoccurring overfished status determination for these species. The low value for natural mortality creates a numerical similar value for MSST and SSB_{MSY}. The Council decided that the natural mortality estimation for nine species undergoing overfishing is considerably greater than those for snowy grouper and golden tilefish. As such, the same concern does not apply to these nine species.

Rejected Alternative 7. Divide the commercial quota for snowy grouper by region/state. Allocate 0.03% to states in the MAFMC's jurisdiction (excluding North Carolina) (23 pounds gutted weight), 60.26% to North Carolina and South Carolina (50,622 pound gutted weight), and 39.71% to Georgia and Florida (33,355 pounds gutted weight). Each region's directed quota (after adjustment for PQBM) would be tracked by dealer reporting. After the commercial quota is met in either region, all purchase and sale is prohibited in that region and harvest and/or possession is limited to the bag limit in that region.

Rejected Alternative 8. Divide the commercial quota for snowy grouper by region/state. Allocate 0.03% to states in the MAFMC's jurisdiction (excluding North Carolina) (23 pounds gutted weight), 35.71% to North Carolina (30,000 pound gutted weight), 24.55% to South Carolina (20,622 lbs gutted weight) and 2.92% to Georgia (2,452 pounds gutted weight), and 36.79% to Florida (30,903 pounds gutted weight). Each state/region's directed quota (after adjustment for PQBM) would be tracked by dealer reporting. After the commercial quota is met in either region, all purchase and sale is prohibited in that state/region and harvest and/or possession is limited to the bag limit in that state/region.

Rationale for elimination: The Council was concerned that the reduction in the magnitude of the snowy grouper commercial quota for snowy grouper implemented through Amendment 13C could increase the probability that the quota could be met through fishing in one region less affected by inclement weather before the start of the fishing season in another. However, since this action was put into place in 2006, the commercial quota has not been met. It is likely that the small trip limit (100 lb gutted weight) has reduced the incentive for fishermen to target this species. In addition, there was concern that harvest restrictions in other fisheries could amplify this effect by resulting in increased fishing effort in the deepwater fishery. As a result, the Council felt that the implementation of state/regional commercial quotas for snowy grouper could increase the probability that there would be a portion of the commercial quota available to

users of all states/regions before the primary fishing season for snowy grouper in each state/region begins. Alternatives 7 and 8; however, were rejected from detailed analysis as they would allocate an unmanageable and untrackable quota (0.03%) to the MAFMC region. Furthermore, the Council felt that it was not reasonable to divide a small quota (84,000 lbs gutted weight) among other states/regions. The Council previously considered but rejected an alternative in Amendment 13C to divide snowy grouper quota among states because of concerns about accurately tracking the small snowy grouper quotas.

Rejected Alternatives 9-12. Define allocations for eight species in the Snapper Grouper Fishery Management Unit undergoing overfishing (Table 3).

Note: The Council's selection of the preferred alternative could vary for eight species experiencing overfishing. In other words, the same preferred alternative does not have to be chosen for all eight species

Alternative 9. Define allocations based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on landings from the years 1986-2007.

Alternative 10. Define allocations based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on landings from the years 2005-2007.

Alternative 11. Define allocations based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on the following formula for each sector: Sector apportionment = (50% * average of long catch range (lbs) 1986-2007) + (50% * average of recent catch trend (lbs) 2005-2007)

Alternative 12. Split the allocation equally among the three sectors.

<u>Rationale for elimination</u>: Amendment 17B, if implemented, would establish allocations for golden tilefish. At their December 2006 meeting, the Council decided not to specify allocations for black sea bass, snowy grouper, gag, vermilion snapper, speckled hind, warsaw grouper, black grouper, or red grouper in Amendment 17, which later was divided into Amendment 17B. Interim allocations have been specified for the black sea bass in Amendment 13C and for snowy grouper in Amendment 15b. Interim allocation have been specified for gag and vermilion snapper in Amendment 16. The Council did not feel that it was necessary to specify allocations for speckled hind and warsaw grouper as the SSCs current recommendation for acceptable biological catch for these two species is zero. Further, the Council did not see a strong need specify black grouper or red grouper allocations at this point since there will be stock assessments completed for these species in the near future. Therefore, if Amendment 17B were to go into place in 2010, it would immediately be followed by the new stock assessment.

Table 3. Percent allocations from allocation alternatives for the ten species undergoing overfishing. CM = Commercial, RC = Recreational, FH = For Hire, PR = Private Recreational, NS=Not Specified.

Species	**No Action**		**Alt. 9. 1986-2007**			**Alt. 10. 2005-2007**			**Alt. 11. Equation**			**Alt. 12. Split Evenly**		
	CM	**RC**	**CM**	**FH**	**PR**	**CM**	**FH**	**PR**	**CM**	**FH**	**PR**	**CM**	**FH**	**PR**
Snowy grouper	95%	5%	89%	5%	6%	68%	32%	0%	79%	18%	3%	33%	33%	33%
Speckled hind	NS	NS	67%	32%	1%	8%	92%	0%	38%	62%	0%	33%	33%	33%
Warsaw grouper	NS	NS	9%	10%	81%	1%	45%	54%	5%	28%	67%	33%	33%	33%
Black grouper	NS	NS	56%	13%	31%	34%	49%	16%	45%	31%	24%	33%	33%	33%
Black sea bass	43%	57%	39%	33%	29%	40%	22%	38%	39%	27%	33%	33%	33%	33%
Gag	51%	49%	64%	19%	17%	59%	17%	25%	61%	18%	21%	33%	33%	33%
Red grouper	NS	NS	55%	20%	25%	41%	14%	44%	48%	17%	35%	33%	33%	33%
Vermilion snapper	68%	32%	64%	32%	4%	62%	34%	5%	63%	33%	4%	33%	33%	33%

Rejected Alternative 13. Establish an ACL of 0 lbs., which would prohibit all fishing for, possession and retention of snowy grouper.

Rationale for elimination: The status quo condition would allow Amendment 17B to specify the 82,900 lbs gw quota and 523 fish recreational allocation as ACLs for the commercial and recreational sectors, respectively. These ACLs are based on the yield at F_{OY}. These catch levels were determined to be based upon the best available science by the SSC and would end overfishing and satisfy the requirements of the reauthorized Magnuson-Stevens Act. To achieve an ACL of 0, the Council would need to propose regulations that would prohibit harvest, possession, and retention of co-occurring snapper grouper species on the shelf edge where juvenile snowy grouper occur. Therefore, reducing the ACL to 0 for both sectors would most likely result in significant beneficial biological benefits to the snowy grouper stock, but would have significant adverse economic and social impacts to fishermen. The Council does not believe that setting an ACL of 0 for snowy grouper is warranted at this time.

Rejected Alternative 14. The commercial quota would serve as the ACL for the commercial and recreational sectors for snowy grouper. The commercial and recreational AM would be to prohibit harvest, possession, and retention in both sectors when the commercial quota is met.

Rationale for elimination: The Council rejected this alternative because the quota for snowy grouper has never been met since implementing new regulations in 2006 through Amendment 13C. Therefore, the Council did not believe that this was a reasonable alternative for ensuring that the recreational sector did not exceed its ACL.

Rejected Alternative 15. For black grouper, black sea bass, gag, red grouper, and vermillion snapper, the recreational sector ACT equals the recreational sector ACL.

Rationale for elimination: The Council did not believe there is a need to establish an ACT if it would equal the ACL. An ACT is typically set lower than the ACL to reduce the risk of exceeding the ACL.

Rejected Alternative 16. Establish an ACL = 0 for speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of all deepwater species (snowy grouper, golden tilefish, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper). Allow harvest for golden tilefish in the area between 100 m and 300 m depth (coordinates to be specified in Appendix X) (Figures 4-x).

Sub-Alternative 16a. Require the use of an approved vessel monitoring system (VMS) by any fishing vessel for golden tilefish.

Rejected Alternative 17. Establish an ACL = 0 for speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of all deepwater snapper species (snowy grouper, golden tilefish, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper) beyond a depth of 240 feet (40 fathoms; 73 m). Allow harvest of golden tilefish in the area between 100 m and 300 m depth (coordinates to be specified in Appendix X) (Figures 4-x).

Sub-Alternative 17a. Require the use of an approved vessel monitoring system (VMS) by any fishing vessel for golden tilefish.

Rationale for elimination: The Council does not believe the creation of allowable golden tilefish areas are necessary. The areas would have a negative effect on law enforcement. Examination of logbook and MRFSS reveals that warsaw grouper and speckled hind were very rarely taken on trips with golden tilefish during 2004-2006 (Tables 1 and 2). Golden tilefish are usually caught over mud habitat in depths of 180 to 300 m (Low et al. 1983; Able et al. 1993) but most commonly occur at depths of 200 m (Dooley 1978). Speckled hind and warsaw grouper prefer rocky habitats and are not found over mud (Heemstra and Randall 1993). Longline gear is sometimes set over rocky bottom in 180 to 300 m where snowy grouper, blueline tilefish, and blackbelly rosefish are caught. On these sets, golden tilefish are also caught in areas where longline gear crosses over mud habitat. While few speckled hind and warsaw grouper are taken on trips with golden tilefish, there is a chance catch of these species could occur when fishing gear is set over rocky habitat and mud.

Table 1. Species taken of commercial trips during 2004-2006 when at least 1 pound of golden tilefish was caught.

COMMON	Obs	Mean	Sum
GOLDEN TILEFISH	1065	980	1,044,019
GROUPER,SNOWY	425	571	242,719
BLACK BELLIED ROSEFISH	176	788	138,643
SHARK,SANDBAR	64	1,499	95,957
TILEFISH,BLUELINE	256	356	91,137
GROUPER,YELLOWEDGE	171	257	43,872
DOLPHINFISH	213	117	24,947
SHARK,HAMMERHEAD	36	481	17,333
GROUPER,RED	42	372	15,623
AMBERJACK,GREATER	72	202	14,518
KING MACKEREL	103	138	14,183
SNAPPER,VERMILION	59	205	12,102
HAKE,ATLANTIC,RED & WHITE	110	82	8,984
GROUPER,BLACK	22	377	8,294
SPANISH MACKEREL	22	322	7,082

COMMON	Obs	Mean	Sum
SHARK,SILKY	13	389	5,061
SHARK,ATLANTIC SHARPNOSE	20	246	4,929
SCAMP	28	169	4,731
SNAPPER,MUTTON	31	152	4,721
HIND,SPECKLED	15	283	4,244
SHARK,BLACKTIP	12	336	4,034
GROUPER,GAG	21	189	3,977
SNAPPER,YELLOWTAIL	33	118	3,898
TRIGGERFISH,GRAY	29	127	3,696
AMBERJACK,LESSER	29	118	3,420
TUNA,YELLOWFIN	9	357	3,210
BARRELFISH	26	118	3,079
EELS,UNC	81	35	2,856
SCORPIONFISH-THORNYHEADS	57	49	2,783
SNAPPER,SILK	22	114	2,507
SHARK,BULL	5	400	1,999
SNAPPER,RED	23	84	1,938
COD,ATLANTIC,UNC	8	238	1,901
JACK,ALMACO	28	58	1,633
SNAPPER,QUEEN	12	125	1,500
FINFISHES,UNC FOR FOOD	29	44	1,286
WRECKFISH	1	1,232	1,232
WAHOO	28	38	1,078
SHARK,LEMON	1	974	974
SHARK,TIGER	8	121	972
BARRACUDA	22	38	840
SHARK,UNC,FINS	13	62	806
EEL,CONGER	16	45	712
SEA BASSE,ATLANTIC,BLACK,UNC	17	40	688
TUNA,BLACKFIN	6	111	666
BLUE RUNNER	37	17	616
SHARK,FINETOOTH	2	288	577
SHARK,GREAT HAMMERHEAD	2	285	570
PORGY,RED,UNC	21	25	523
SNAPPER,MANGROVE	14	36	508
LOBSTER,SPINY	5	97	485
BANDED RUDDERFISH	11	42	458
SHARK,MAKO UNC	5	91	456
GROUPER,YELLOWFIN	4	112	450
PORGY,JOLTHEAD	16	27	435
COBIA	10	43	432
SQUIRRELFISHES	7	60	418
GRUNTS	8	51	408
BLUEFISH	6	66	398
AMBERJACK	1	374	374

COMMON	Obs	Mean	Sum
GROUPER,WARSAW	2	165	330
35 others			2,447

Table 2. Species taken on MRFSS trips during 2004-2006 when at least 1 golden tilefish was caught.

common	Percent
golden tilefish	61.03%
black sea bass	15.05%
dolphin	11.36%
snowy grouper	5.08%
king mackerel	1.39%
unidentified fish	0.92%
little tunny	0.83%
tautog	0.83%
blueline tilefish	0.74%
red porgy	0.65%
redtail scad	0.55%
vermilion snapper	0.37%
amberjack genus	0.18%
blackfin tuna	0.18%
bigeye	0.09%
cero	0.09%
cobia	0.09%
mutton snapper	0.09%
red grouper	0.09%
sailfish	0.09%
scamp	0.09%
speckled hind	0.09%
tripletail	0.09%

Annual Catch Limits

Rejected Alternative 18. ACL equals ABC.

Rejected Alternative 19. ACL equals 90% of the ABC.

Rejected Alternative 20. ACL equals 80% of the ABC.

Note: The Council may specify more than one preferred alternative for this action as 10 species are under consideration.

Allocations

Rejected Alternative 21. Define allocations based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on landings from the years 1986-2007.

Rejected Alternative 22. Define allocations based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on landings from the years 2005-2007.

Rejected Alternative 23. Define allocations based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on the following formula for each sector: Sector apportionment = (50% * average of long catch range (lbs) 1986-2007) + (50% * average of recent catch trend (lbs) 2005-2007).

Note: The Council's selection of the preferred alternative could vary for the four species experiencing overfishing. In other words, the same preferred alternative does not have to be chosen for all four species

Annual Catch Targets for the Commercial Sector

Rejected Alternative 24. The commercial sector ACT equals the commercial sector ACL.

Rejected Alternative 25. The commercial sector ACT equals 90% of the commercial sector ACL.

Rejected Alternative 26. The commercial sector ACT equals 80% of the commercial sector ACL.

Note: The Council may specify more than one preferred alternative for this action as 9 species are under consideration.

Annual Catch Targets for the Recreational Sector

Rejected Alternative 27. The recreational sector ACT equals 85% of the private recreational sector ACL.

Rejected Alternative 28. The recreational sector ACT equals 75% of the private recreational sector ACL.

Rejected Alternative 29. The recreational sector ACT equals sector ACL[(1-PSE) or 0.5, whichever is greater].

Note: The Council may specify more than one preferred alternative for this action as 10 species are under consideration.

Accountability Measures for the Commercial Sector

Rejected Alternative 30. Implement Accountability Measures for the commercial sector for **species undergoing overfishing**. If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to **reduce the sector ACT** in the following year by the amount of the overage.

Rejected Alternative 31. Implement Accountability Measures for the commercial sector for **species undergoing overfishing**. If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to **reduce the length of the following fishing year** by the amount necessary to recover the overage from the prior fishing year.

Rejected Alternative 32. Implement Accountability Measures for the commercial sector **for species undergoing overfishing**. **If the species is overfished or not overfished and the sector ACT** is projected to be met, prohibit the harvest and retention of species or species group. **If the species is overfished and the sector ACL is exceeded**, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage. **If the species is not overfished and the sector ACL** is exceeded, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to recover the overage from the prior fishing year.

Accountability Measures for the Recreational Sector

Rejected Alternative 33. Implement Accountability Measures (AMs) for the recreational sector for species undergoing overfishing. **The AM would not vary depending on stock status.**

> **Sub-alternative 33A**. Do **not implement *in season* AMs if the sector ACT is projected to be met**. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to **reduce the length of the following fishing year** by the amount necessary to ensure landings do not exceed the sector ACT for the following fishing year.
>
> **Sub-alternative 33B. Do not implement *in season* AMs if the sector ACT is projected to be met**. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to **reduce the sector ACT** in the following year by the amount of the overage.

Sub-alternative 33C. If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to **reduce the length of the following fishing year** by the amount necessary to recover the overage from the prior fishing year.

Sub-alternative 33D. If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. If the sector ACL is exceeded, the Assistant Administrator shall publish a notice to **reduce the sector ACT** in the following year by the amount of the overage.

Alternative 34. Implement Accountability Measures for the recreational sector for species undergoing overfishing. **The AM would vary depending on stock status.**

Sub-alternative 34A. Do not implement ***in season*** AMs if the sector ACT is projected to be met. **If the species is overfished and the ACL is exceeded**, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage. **If not overfished and the ACL is exceeded**, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACT for the following fishing year.

Sub-alternative 34B. If the sector ACT is projected to be met, prohibit the harvest and retention of species or species group. **If the species is overfished and the ACL is exceeded**, the Assistant Administrator shall publish a notice to reduce the sector ACT in the following year by the amount of the overage. **If not overfished and the ACL is exceeded**, the Assistant Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the sector ACT for the following fishing year.

Alternative 35. Compare ACL in Alternatives 2 and 3 with 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 three year running average.

<u>Rationale for elimination</u>: During the Amendment development process, the Council considered a system that would establish allocations, Annual Catch Limits (ACLs), Annual Catch Targets (ACTs), and Accountability Measures (AMs) for the ten species undergoing overfishing with the SSC's ABC recommendation as an upper limit. Under this system, the Council would then evaluate whether current regulations would be expected to keep the mortality below the ACT for each of these species. If not, the Council would propose regulatory changes.

During the development of the amendment guidelines became available, which indicate ACTs are not a requirement of the reauthorized Magnuson-Stevens Act. Rather, the

Council has the option of using ACTs to ensure ACLs are not exceeded if they feel it is appropriate. The Council is continuing to evaluate ACLs, ACTs, AMs, and management measures in Amendments 17A and 17B for ten species undergoing overfishing (the rationale for the exclusion of allocations alternatives for red snapper is described above). However, the Council has acknowledged that ACLs, ACTs, allocations, and AMs are in place for some fisheries. For example, the Council views the commercial quota for snowy grouper at the yield at the fishing mortality at optimum yield level and the regulations that specify a closure when the quota is projected to be met to represent a commercial ACL and a commercial AM, respectively. The Council directed staff to include these descriptions in the status quo alternative.

In turn, the Council is evaluating where ACLs, ACTs, AMs, allocations, and management measures are not in place or are not sufficient to keep mortality at the ACL and proposing these reference points where appropriate. For example, the Council views the recreational ACL of 523 snowy grouper currently in place as a sufficient ACL for the recreational sector. However, the Council is proposing AMs for the recreational sector for the snowy grouper fishery and a change in regulations to ensure that mortality remains below the recreational ACL. The Council is also considering alternatives that would modify existing ACLs, ACTs, AMs, allocations, and management measures to ensure overfishing does not occur.

In summary, the Council decided to move from a comprehensive approach to establish ACLs, ACTs, allocations, AMs, and management regulations to one that evaluates where these reference points are currently in place. If the management reference points are not in place or are insufficient to meet the goals and objectives of the Magnuson-Stevens Act, the Council is proposing action in Amendment 17B.

Rejected Alternative 36. Establish an ACL = 0 for speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of all deepwater species (snowy grouper, golden tilefish, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper). Allow harvest for golden tilefish in the area between 100 m and 300 m depth (coordinates to be specified in Appendix X) (Figures 4-x).

Sub-Alternative 36a. Require the use of an approved vessel monitoring system (VMS) by any fishing vessel for golden tilefish.

Rejected Alternative 37. Establish an ACL = 0 for speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of all deepwater snapper species (snowy grouper, golden tilefish, blueline tilefish, yellowedge grouper, warsaw grouper, speckled hind, misty grouper, queen snapper, and silk snapper) beyond a depth of 240 feet (40 fathoms; 73 m). Allow harvest of golden tilefish in the area between 100 m and 300 m depth (coordinates to be specified in Appendix X) (Figures 4-x).

Sub-Alternative 37a. Require the use of an approved vessel monitoring system (VMS) by any fishing vessel for golden tilefish.

Rationale for elimination: The Council removed allowable golden tilefish fishing areas from these alternatives. Speckled hind and warsaw grouper are rarely taken on trips where golden tilefish is also harvested.

Rejected Alternative 38. Establish the commercial ACL (quota) at the F_{OY} level. The commercial quota would be 321,003 lbs ww (286,609 lbs gw). The commercial AM for this stock is to prohibit harvest, possession, and retention when the quota is met. All purchase and sale is prohibited when the quota is met.

Rationale for elimination: This alternative did not meet the purpose and need of the amendment as it did not specify a recreational AM.

Rejected Alternative 39. Define allocations for golden tilefish based upon landings from the ALS, MRFSS, and headboat databases. The allocation would be based on landings from the years 1986-2008. The allocation would be 97% commercial and 3% recreational. Beginning in 2010, the commercial allocation would be 291,369 lbs gutted weight and the recreational allocation would be 1,625 fish (9,011 lbs gutted weight). The commercial and recreational allocation specified for 2010 would remain in effect beyond 2010 until modified.

Rationale for elimination: The percentage allocations in this alternative are identical to another alternative being analyzed in detail.

Appendix B. Glossary

Allowable Biological Catch (ABC): Maximum amount of fish stock than can be harvested without adversely affecting recruitment of other components of the stock. The ABC level is typically higher than the total allowable catch, leaving a buffer between the two.

ALS: Accumulative Landings System. NMFS database which contains commercial landings reported by dealers.

Biomass: Amount or mass of some organism, such as fish.

B_{MSY}: Biomass of population achieved in long-term by fishing at F_{MSY}.

Bycatch: Fish harvested in a fishery, but not sold or kept for personal use. Bycatch includes economic discards and regulatory discards, but not fish released alive under a recreational catch and release fishery management program.

Caribbean Fishery Management Council (CFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The CFMC develops fishery management plans for fisheries off the coast of the U.S. Virgin Islands and the Commonwealth of Puerto Rico.

Catch Per Unit Effort (CPUE): The amount of fish captured with an amount of effort. CPUE can be expressed as weight of fish captured per fishing trip, per hour spent at sea, or through other standardized measures.

Charter Boat: A fishing boat available for hire by recreational anglers, normally by a group of anglers for a short time period.

Cohort: Fish born in a given year. (See year class.)

Control Date: Date established for defining the pool of potential participants in a given management program. Control dates can establish a range of years during which a potential participant must have been active in a fishery to qualify for a quota share.

Constant Catch Rebuilding Strategy: A rebuilding strategy where the allowable biological catch of an overfished species is held constant until stock biomass reaches B_{MSY} at the end of the rebuilding period.

Constant F Rebuilding Strategy: A rebuilding strategy where the fishing mortality of an overfished species is held constant until stock biomass reached BMSY at the end of the rebuilding period.

Directed Fishery: Fishing directed at a certain species or species group.

Discards: Fish captured, but released at sea.

Discard Mortality Rate: The percent of total fish discarded that do not survive being captured and released at sea.

Derby: Fishery in which the TAC is fixed and participants in the fishery do not have individual quotas. The fishery is closed once the TAC is reached, and participants attempt to maximize their harvests as quickly as possible. Derby fisheries can result in capital stuffing and a race for fish.

Effort: The amount of time and fishing power (i.e., gear size, boat size, horsepower) used to harvest fish.

Exclusive Economic Zone (EEZ): Zone extending from the shoreline out to 200 nautical miles in which the country owning the shoreline has the exclusive right to conduct certain activities such as fishing. In the United States, the EEZ is split into state waters (typically from the shoreline out to 3 nautical miles) and federal waters (typically from 3 to 200 nautical miles).

Exploitation Rate: Amount of fish harvested from a stock relative to the size of the stock, often expressed as a percentage.

F: Fishing mortality.

Fecundity: A measurement of the egg-producing ability of fish at certain sizes and ages.

Fishery Dependent Data: Fishery data collected and reported by fishermen and dealers.

Fishery Independent Data: Fishery data collected and reported by scientists who catch the fish themselves.

Fishery Management Plan: Management plan for fisheries operating in the federal produced by regional fishery management councils and submitted to the Secretary of Commerce for approval.

Fishing Effort: Usually refers to the amount of fishing. May refer to the number of fishing vessels, amount of fishing gear (nets, traps, hooks), or total amount of time vessels and gear are actively engaged in fishing.

Fishing Mortality: A measurement of the rate at which fish are removed from a population by fishing. Fishing mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Fishing Power: Measure of the relative ability of a fishing vessel, its gear, and its crew to catch fishes, in reference to some standard vessel, given both vessels are under identical conditions.

$F_{30\%SPR}$: Fishing mortality that will produce a static SPR = 30%.

$F_{45\%SPR}$: Fishing mortality that will produce a static SPR = 45%.

F_{OY}: Fishing mortality that will produce OY under equilibrium conditions and a corresponding biomass of B_{OY}. Usually expressed as the yield at 85% of F_{MSY}, yield at 75% of F_{MSY}, or yield at 65% of F_{MSY}.

F_{MSY}: Fishing mortality that if applied constantly, would achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}

Fork Length (FL): The length of a fish as measured from the tip of its snout to the fork in its tail.

Gear restrictions: Limits placed on the type, amount, number, or techniques allowed for a given type of fishing gear.

Growth Overfishing: When fishing pressure on small fish prevents the fishery from producing the maximum poundage. Condition in which the total weight of the harvest from a fishery is improved when fishing effort is reduced, due to an increase in the average weight of fishes.

Gulf of Mexico Fishery Management Council (GFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The GFMC develops fishery management plans for fisheries off the coast of Texas, Louisiana, Mississippi, Alabama, and the west coast of Florida.

Head Boat: A fishing boat that charges individual fees per recreational angler onboard.

Highgrading: Form of selective sorting of fishes in which higher value, more marketable fishes are retained, and less marketable fishes, which could legally be retained are discarded.

Individual Fishing Quota (IFQ): Fishery management tool that allocates a certain portion of the TAC to individual vessels, fishermen, or other eligible recipients.

Longline: Fishing method using a horizontal mainline to which weights and baited hooks are attached at regular intervals. Gear is either fished on the bottom or in the water column.

Magnuson-Stevens Fishery Conservation and Management Act: Federal legislation responsible for establishing the fishery management councils and the mandatory and discretionary guidelines for federal fishery management plans.

Marine Recreational Fisheries Statistics Survey (MRFSS): Survey operated by NMFS in cooperation with states that collects marine recreational data.

Maximum Fishing Mortality Threshold (MFMT): The rate of fishing mortality above which a stock's capacity to produce MSY would be jeopardized.

Maximum Sustainable Yield (MSY): The largest long-term average catch that can be taken continuously (sustained) from a stock or stock complex under average environmental conditions.

Minimum Stock Size Threshold (MSST): The biomass level below which a stock would be considered overfished.

Modified F Rebuilding Strategy: A rebuilding strategy where fishing mortality is changed as stock biomass increases during the rebuilding period.

Multispecies fishery: Fishery in which more than one species is caught at the same time and location with a particular gear type.

National Marine Fisheries Service (NMFS): Federal agency within NOAA responsible for overseeing fisheries science and regulation.

National Oceanic and Atmospheric Administration: Agency within the Department of Commerce responsible for ocean and coastal management.

Natural Mortality (M): A measurement of the rate at which fish are removed from a population by natural causes. Natural mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

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

Overfished: A stock or stock complex is considered overfished when stock biomass falls below the minimum stock size threshold (MSST) (e.g., current biomass < MSST = overfished).

Overfishing: Overfishing occurs when a stock or stock complex is subjected to a rate of fishing mortality that exceeds the maximum fishing mortality threshold (e.g., current fishing mortality rate > MFMT = overfishing).

Quota: Percent or annual amount of fish that can be harvested.

Recruitment (R): Number or percentage of fish that survives from hatching to a specific size or age.

Recruitment Overfishing: The rate of fishing above which the recruitment to the exploitable stock becomes significantly reduced. This is characterized by a greatly reduced spawning stock, a decreasing proportion of older fish in the catch, and generally very low recruitment year after year.

Scientific and Statistical Committee (SSC): Fishery management advisory body composed of federal, state, and academic scientists, which provides scientific advise to a fishery management council.

Selectivity: The ability of a type of gear to catch a certain size or species of fish.

South Atlantic Fisheries Management Council (SAFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The SAFMC develops fishery management plans for fisheries off North Carolina, South Carolina, Georgia, and the east coast of Florida.

Spawning Potential Ratio (Transitional SPR): Formerly used in overfished definition. The number of eggs that could be produced by an average recruit in a fished stock divided by the number of eggs that could be produced by an average recruit in an unfished stock. SPR can also be expressed as the spawning stock biomass per recruit (SSBR) of a fished stock divided by the SSBR of the stock before it was fished.

% Spawning Per Recruit (Static SPR): Formerly used in overfishing determination. The maximum spawning per recruit produced in a fished stock divided by the maximum spawning per recruit, which occurs under the conditions of no fishing. Commonly abbreviated as %SPR.

Spawning Stock Biomass (SSB): The total weight of those fish in a stock which are old enough to spawn.

Spawning Stock Biomass Per Recruit (SSBR): The spawning stock biomass divided by the number of recruits to the stock or how much spawning biomass an average recruit would be expected to produce.

Total Allowable Catch (TAC): The total amount of fish to be taken annually from a stock or stock complex. This may be a portion of the Allowable Biological Catch (ABC) that takes into consideration factors such as bycatch.

Total Length (TL): The length of a fish as measured from the tip of the snout to the tip of the tail.

Appendix C. Essential Fish Habitat and Movement towards Ecosystem-Based Management

With the Habitat Plan as a cornerstone, the Council is adopting an ecosystem-based approach to fisheries management. Evolution of the Habitat Plan into a Fishery Ecosystem Plan, and transition from single species management to ecosystem-based management, will require a greater understanding of the South Atlantic Bight ecosystem and the complex relationships among humans, marine life and essential fish habitat. This effort will provide a more comprehensive understanding of the biological, social and economic impacts of management

A series of 15 workshops were held during 2003 to integrate and update habitat information and begin development of the South Atlantic Fishery Ecosystem Plan (FEP). These workshops brought together Habitat and Coral Advisory Panel members and a core group of resource and habitat experts from cooperating federal, state and academic institutions as well as conservation organizations that participated directly in development of the Habitat Plan. Updated life history and stock status information on managed species and the characteristics of the food web they exist within will be incorporated as well as social and economic research needed to fully address ecosystem-based management. Writing Teams (composed of AP members, experts from state and federal agencies, universities and Council staff) will review, update and expand chapters of the Habitat Plan and develop new chapters for the FEP (e.g., Ecosystem Modeling and Research Needs to support Ecosystem-Based Management). Information compiled during, and as follow-up to the workshops, is helping the Council meet the EFH mandate to update EFH and EFH-HAPC information and designations. This will also help the Council meet the National Environmental Policy Act (NEPA) mandate to update Environmental Impact Statements (EIS) for all fishery management plans under Council jurisdiction. The FEP will be used to develop a Comprehensive Amendment/EIS for all Fishery Management Plans (FMPs).

Workshops to expand efforts initiated during the habitat and issue-based workshops will be held during 2005 on topics such as artificial reefs, deepwater habitat/coral, marine zoning and impacts of fishing on habitat. In addition, it is anticipated that a regional workshop to identify research and monitoring needs to support ecosystem-based management and further development of the FEP in the South Atlantic region will be held in 2005. Internationally recognized experts in ecosystem characterization will be invited to participate to provide guidance to managers and researchers in determining the most significant needs to be addressed in development of an ecosystem-based management approach.

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

The Council actively comments on non-fishing projects or policies that may impact fish habitat. Appendix A of the Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans of the South Atlantic Region (SAFMC 1998b) outlines the Council's comment and policy development process and the establishment of a four-state Habitat Advisory Panel. Members of the Habitat Advisory Panel serve as the Council's habitat contacts and professionals in the field. AP

members bring projects to the Council's attention, draft comment letters, and attend public meetings. With guidance from the Advisory Panel, the Council has developed and approved policies on:

1. Energy exploration, development and transportation;
2. Beach dredging and filling and large-scale coastal engineering;
3. Protection and enhancement of submerged aquatic vegetation; and
4. Alterations to riverine, estuarine and nearshore flows.

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

South Atlantic Bight Ecopath Model

The Council is developing a food web model (Ecopath with Ecosim) to characterize the ecological relationships of South Atlantic species, including those managed by the Council. This effort will help the Council and cooperators in identifying available information and data gaps while providing insight into ecosystem function. More importantly, the model will aid in identifying research necessary to better define populations, fisheries and their interrelationships. The model will include the area between Cape Hatteras, North Carolina, through the Florida Keys and extend from the upper wetlands to the 300-meter isobath. Catch data from 1995 to 2002 will be included. The Council is investigating the possibility of expanding and refining the South Atlantic Ecopath Model with development of embedded sub-models for the *Oculina* Bank HAPC, The Florida Keys, Deepwater Snapper Grouper Habitat and Albemarle-Pamlico Sound.

Cooperative Research to Support Ecosystem-Based Management

High Resolution Maps of Habitat on the South Atlantic Continental Shelf

The Council has partnered with the National Undersea Research Center at the University of North Carolina at Wilmington (NURC/UNCW) by providing seed money to begin multi-beam sonar mapping of the outer continental shelf and upper continental slope using an Autonomous Underwater Vehicle (AUV). This region of the Exclusive Economic Zone (EEZ) from just north of Cape Hatteras (North Carolina) to Cape Canaveral (Florida), covering a depth range of 100-500 m, includes important habitat for current and future economically valuable species (e.g., groupers, wreckfish, crabs, tilefish, etc.). Habitats used by these species include soft bottoms of various types and a wide range of hard bottom lithotypes. This area includes important and unique features such as "The Point" canyon system (just north of Cape Hatteras, North Carolina) and the "Charleston Bump" (off of Cape Romain, South Carolina). The features of these two EFH-HAPCs result in significant oceanographic effects in the region (e.g., upwellings) and also represent productive fishery areas. Throughout the region, and toward the deeper end (350-450 m), are scattered but extensive deep reef systems composed of delicate, slow growing ahermatypic corals (e.g., *Lophelia*). All of these habitats are poorly mapped. In addition, the Council is considering deepwater MPAs that fall in the

same depth range. High-resolution (1-2 m) bathymetry maps are required for these areas. The AUV will be operated by NURC/UNCW and maintained and operated by NURC/UNCW. It will be used in the initial testing by mapping deepwater coral and associated habitats in the South Atlantic.

Regional Internet Map Server for Coral and Live/Hard Bottom Habitat and South Atlantic Habitat/Ecosystem Web Site

The South Atlantic Council and the Florida Fish and Wildlife Research Institute (FWRI) are developing a Coral and Essential Fish Habitat/Ecosystem web site. The website hosts an Internet Map Server (IMS) application that provides access to downloadable GIS data and metadata, imagery, and documents related to EFH, EFH-HAPCs, and coral and benthic habitats across the South Atlantic Region (the Carolinas, Georgia, and Florida). The IMS is an effective tool for displaying, sharing and querying information related to hard bottom and EFH across the South Atlantic coast. The video and still imagery archives served from this site will provide researchers a unique opportunity to observe and monitor the health and abundance of coral and benthic habitats throughout the South Atlantic region. The IMS also serves as a repository of historic and current information to be used by managers, scientists and the general public.

The Habitat/Ecosystem website was designed to track the Council's Action Plan for Ecosystem-Based Management. The latter was designed to address the ecosystem-based management principles recommended by the Ecosystem Principles Advisory Panel in their 1999 report to Congress. Thus, visitors to the site can fully appreciate the Council's efforts in moving towards this new management approach and gain access to more detailed information as to the actions the Council is taking to fully embrace ecosystem-based fisheries management in the South Atlantic region. The website can be accessed through the Council's main website at www.safmc.net.

Essential Fish Habitat and Essential Fish Habitat Areas of Particular Concern

Following is a summary of the current South Atlantic Council's EFH and EFH-HAPCs. Information supporting their designation will be reviewed, revised and updated (pursuant to the EFH Final Rule):

Snapper Grouper FMP

Essential fish habitat for snapper-grouper species includes coral reefs, live/hard bottom, submerged aquatic vegetation, artificial reefs and medium to high profile outcroppings on and around the shelf break zone from shore to at least 600 feet (but to at least 2000 feet for wreckfish) where the annual water temperature range is sufficiently warm to maintain adult populations of members of this largely tropical complex. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for larval survival and growth up to and including settlement. In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse snapper grouper larvae.

For specific life stages of estuarine dependent and nearshore snapper-grouper species, essential fish habitat includes areas inshore of the 100-foot contour, such as attached macroalgae; submerged rooted vascular plants (seagrasses); estuarine emergent vegetated

wetlands (saltmarshes, brackish marsh); tidal creeks; estuarine scrub/shrub (mangrove fringe); oyster reefs and shell banks; unconsolidated bottom (soft sediments); artificial reefs; and coral reefs and live/hard bottom.

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

Shrimp FMP

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

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

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

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

Coastal Migratory Pelagics FMP

Essential fish habitat for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side

waters, from the surf to the shelf break zone, but from the Gulf stream shoreward, including *Sargassum*. In addition, all coastal inlets, all state-designated nursery habitats of particular importance to coastal migratory pelagics (for example, in North Carolina this would include all Primary Nursery Areas and all Secondary Nursery Areas).

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

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

Golden Crab FMP

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

Spiny Lobster FMP

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

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

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

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

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

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

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

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

Areas which meet the criteria for EFH-HAPCs for coral, coral reefs, and live/hard bottom include The 10-Fathom Ledge, Big Rock, and The Point (North Carolina); Hurl Rocks and The Charleston Bump (South Carolina); Gray's Reef National Marine Sanctuary (Georgia); The *Phragmatopoma* (worm reefs) reefs off the central east coast of Florida; Oculina Banks off the east coast of Florida from Ft. Pierce to Cape Canaveral; nearshore (0-4 meters; 0-12 feet) hard bottom off the east coast of Florida from Cape Canaveral to Broward County); offshore (5-30 meter; 15-90 feet) hard bottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida; Biscayne National Park, Florida; and the Florida Keys National Marine Sanctuary.

Dolphin and Wahoo FMP

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

Areas which meet the criteria for EFH-HAPCs for dolphin and wahoo in the Atlantic include The Point, The Ten-Fathom Ledge, and Big Rock (North Carolina); The Charleston Bump and The Georgetown Hole (South Carolina); The Point off Jupiter Inlet

(Florida); The Hump off Islamorada, Florida; The Marathon Hump off Marathon, Florida; The "Wall" off of the Florida Keys; and Pelagic *Sargassum*. This EFH-HAPC definition for dolphin was approved by the Secretary of Commerce on June 3, 1999 as a part of the South Atlantic Council's Comprehensive Habitat Amendment (dolphin was included within the Coastal Migratory Pelagics FMP).

Actions Implemented That Protect EFH and EFH-HAPCs:

Snapper Grouper FMP

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

Shrimp FMP

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

***Sargassum* FMP**

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

Coastal Migratory Pelagics FMP

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

Golden Crab FMP

- In the northern zone golden crab traps can only be deployed in waters deeper than 900 feet; in the middle and southern zones traps can only be deployed in waters deeper than 700 feet.

Northern zone - north of the 28°N. latitude to the North Carolina/Virginia border;
Middle zone - 28°N. latitude to 25°N. latitude; and
Southern zone - south of 25°N. latitude to the border between the South Atlantic and Gulf of Mexico Fishery Management Councils.

Coral, Coral Reefs and Live/Hard Bottom FMP

- Established an optimum yield of zero and prohibiting all harvest or possession of these resources which serve as essential fish habitat to many managed species.
- Designated of the *Oculina* Bank Habitat Area of Particular Concern
- Expanded the *Oculina* Bank Habitat Area of Particular Concern (HAPC) to an area bounded to the west by 80°W. longitude, to the north by 28°30' N. latitude, to the south by 27°30' N. latitude, and to the east by the 100 fathom (600 feet) depth contour.
- Established the following two Satellite *Oculina* HAPCs: (1) Satellite *Oculina* HAPC #1 is bounded on the north by 28°30'N. latitude, on the south by 28°29'N. latitude, on the east by 80°W. longitude, and on the west by 80°3'W. longitude, and (2) Satellite *Oculina* HAPC #2 is bounded on the north by 28°17'N. latitude, on the south by 28°16'N. latitude, on the east by 80°W. longitude, and on the west by 80°3'W. longitude.
- Prohibited the use of all bottom tending fishing gear and fishing vessels from anchoring or using grapples in the *Oculina* Bank HAPC.
- Established a framework procedure to modify or establish Coral HAPCs.

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

SAFMC Habitat and Environmental Protection Policy

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

SAFMC Policy Statement Concerning Beach Dredging and Filling and Large-Scale Coastal Engineering

Policy Context

This document establishes the policies of the South Atlantic Fishery Management Council (SAFMC) regarding protection of the essential fish habitats (EFH) and habitat areas of particular concern (EFH-HAPCs) impacted by beach dredge and fill activities, and related large-scale coastal engineering projects. The policies are designed to be consistent with the overall habitat protection policies of the SAFMC as formulated and adopted in the Habitat Plan (SAFMC, 1998a) and the Comprehensive EFH Amendment (SAFMC, 1998b).

The findings presented below assess the threats to EFH potentially posed by activities related to the large-scale dredging and disposal of sediments in the coastal ocean and adjacent habitats, and the processes whereby those resources are placed at risk. The policies established in this document are designed to avoid, minimize and offset damage caused by these activities, in accordance with the general habitat policies of the SAFMC as mandated by law.

EFH At Risk from Beach Dredge and Fill Activities

The SAFMC finds:

1) In general, the array of large-scale and long-term beach dredging projects and related disposal activities currently being considered for the United States southeast together constitute a real and significant threat to EFH under the jurisdiction of the SAFMC.

2) The cumulative effects of these projects have not been adequately assessed, including impacts on public trust marine and estuarine resources, use of public trust beaches, public access, state and federally protected species, state critical habitat, SAFMC-designated EFH and EFH-HAPCs.

3) Individual beach dredge and fill projects and related large-scale coastal engineering activities rarely provide adequate impact assessment*s* or consideration of potential damage to fishery resources under state and federal management. Historically, emphasis has been placed on the logistics of dredging and economics, with environmental considerations dominated by compliance with the Endangered Species Act for sea turtles, piping plovers and other listed organisms. There has been little or no consideration of hundreds of other species affected, many with direct fishery value.

4) Opportunities to avoid or minimize impacts of beach dredge and fill activities on fishery resources, and offsets for unavoidable impacts have rarely been proposed or implemented. Monitoring is rarely adequate to develop statistically appropriate impact evaluations.

5) Large-scale beach dredge and fill activities have the potential to impact a variety of habitats across the shelf, including:

a) waters and benthic habitats near the dredging sites
b) waters between dredging and filling sites
c) waters and benthic habitats in or near the fill sites, and
d) waters and benthic habitats potentially affected as sediments move subsequent to deposition in fill areas.

6) Certain nearshore habitats are particularly important to the long-term viability of commercial and recreational fisheries under SAFMC management, and potentially threatened by large-scale, long-term or frequent disturbance by dredging and filling:

a) the swash and surf zones and beach-associated bars
b) underwater soft-sediment topographic features
c) onshore and offshore coral reefs, hardbottom and worm reefs
d) inlets

7) Large sections of South Atlantic waters potentially affected by these projects, both individually and collectively, have been identified as EFH or EFH-HAPC by the SAFMC**,** as well as the Mid-Atlantic Fishery Management Council (MAFMC) in the case of North Carolina. Potentially Affected species and their EFH under federal management include (SAFMC, 1998b):

a) summer flounder (various nearshore waters, including the surf zone and inlets; certain offshore waters)
b) bluefish (various nearshore waters, including the surf zone and inlets)
c) red drum (ocean high-salinity surf zones and unconsolidated bottoms nearshore waters)
d) many snapper and grouper species (live hardbottom from shore to 600 feet, and – for estuarine-dependent species [e.g., gag grouper and gray snapper] – unconsolidated bottoms and live hardbottoms to the 100 foot contour).
e) black sea bass (various nearshore waters, including unconsolidated bottom and live hardbottom to 100 feet, and hardbottoms to 600 feet)
f) penaeid shrimp (offshore habitats used for spawning and growth to maturity, and waters connecting to inshore nursery areas, including the surf zone and inlets)
g) coastal migratory pelagics [e.g., king mackerel, Spanish mackerel] (sandy shoals of capes and bars, barrier island ocean-side waters from the surf zone to the shelf break inshore of the Gulf Stream; all coastal inlets)
h) corals of various types (hard substrates and muddy, silt bottoms from the subtidal to the shelf break)
i) areas identified as EFH for Highly Migratory Species (HMS) managed by the Secretary of Commerce (e.g., sharks: inlets and nearshore waters, including pupping and nursery grounds)

In addition, hundreds of species of crustaceans, mollusks, and annelids that are not directly managed, but form the critical prey base for most managed species, are killed or directly affected by large dredge and fill projects.

8) Beach dredge and fill projects also potentially threaten important habitats for anadromous species under federal, interstate and state management (in particular, inlets and offshore overwintering grounds), as well as essential overwintering grounds and other critical habitats for weakfish and other species managed by the Atlantic States Marine Fisheries Commission (ASMFC) and the states. The SAFMC also identified essential habitats of anadromous and catadromous species in the region (inlets and nearshore waters).

9) Many of the habitats potentially affected by these projects have been identified as EFH-HAPCs by the SAFMC. The specific fishery management plan is provided in parentheses:

a) all nearshore hardbottom areas (SAFMC, snapper grouper).
b) all coastal inlets (SAFMC, penaeid shrimps, red drum, and snapper grouper).
c) near-shore spawning sites (SAFMC, penaeid shrimps, and red drum).
d) benthic *Sargassum* (SAFMC, snapper grouper).
e) from shore to the ends of the sandy shoals of Cape Lookout, Cape Fear, and Cape Hatteras, North Carolina; Hurl Rocks, South Carolina; *Phragmatopora* (worm reefs) reefs off the central coast of Florida and nearshore hardbottom south of Cape Canaveral (SAFMC, coastal migratory pelagics).
f) Atlantic coast estuaries with high numbers of Spanish mackerel and cobia from ELMR, to include Bogue Sound, New River, North Carolina; Broad River, South Carolina (SAFMC, coastal migratory pelagics).
g) Florida Bay, Biscayne Bay, Card Sound, and coral hardbottom habitat from Jupiter Inlet through the Dry Tortugas, Florida (SAFMC, Spiny Lobster)
h) Hurl Rocks (South Carolina), The *Phragmatopoma* (worm reefs) off central east coast of Florida, nearshore (0-4 meters; 0-12 feet) hardbottom off the east coast of Florida from Cape Canaveral to Broward County; offshore (5-30 meters; 15-90 feet) hardbottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida; Biscayne National Park, Florida; and the Florida Keys National Marine Sanctuary (SAFMC, Coral, Coral Reefs and Live Hardbottom Habitat).
i) EFH-HAPCs designated for HMS species (e.g., sharks) in the South Atlantic region (NMFS, Highly Migratory Species).

10) Habitats likely to be affected by beach dredge and fill projects include many recognized in state-level fishery management plans. Examples of these habitats include Critical Habitat Areas established by the North Carolina Marine Fisheries Commission, either in FMPs or in Coastal Habitat Protection Plans (CHAs).

11) Recent work by scientists in east Florida has documented important habitat values for nearshore, hardbottom habitats often buried by beach dredging projects, is used by over 500 species of fishes and invertebrates, including juveniles of many reef fishes. Equivalent scientific work is just beginning in other South Atlantic states, but life histories suggest that similar habitat use patterns will be found.

Threats to Marine and Estuarine Resources from Beach Dredge and Fill Activities and Related Large Coastal Engineering Projects

The SAFMC finds that beach dredge and fill activities and related large-scale coastal engineering projects (including inlet alteration projects) and disposal of material for navigational maintenance, threaten or potentially threaten EFH through the following mechanisms:

1) Direct mortality and displacement of organisms at and near sediment dredging sites
2) Direct mortality and displacement of organisms at initial sediment fill sites
3) Elevated turbidity and deposition of fine sediments down-current from dredging sites
4) Alteration of seafloor topography and associated current and waves patterns and magnitudes at dredging areas
5) Alteration of seafloor sediment size-frequency distributions at dredging sites, with secondary effects on benthos at those sites
6) Elevated turbidity in and near initial fill sites, especially in the surf zone, and deposition of fine sediment down-current from initial fill sites (ASMFC, 2002)
7) Alteration of nearshore topography and current and wave patterns and magnitudes associated with fill
8) Movement of deposited sediment away from initial fill sites, especially onto hardbottoms
9) Alteration of large-scale sediment budgets, sediment movement patterns and feeding and other ecological relationships, including the potential for cascading disturbance effects
10) Alteration of large-scale movement patterns of water, with secondary effects on water quality and biota
11) Alteration of movement patterns and successful inlet passage for larvae, post-larvae, juveniles and adults of marine and estuarine organisms
12) Alteration of long-term shoreline migration patterns (inducing further ecological cascades with consequences that are difficult to predict)
13) Exacerbation of transport and/or biological uptake of toxicants and other pollutants released at either dredge or fill sites

In addition, the interactions between cumulative and direct (sub-lethal) effects among the above factors certainly triggers non-linear impacts that are completely unstudied.

SAFMC Policies for Beach Dredge and Fill Projects and Related Large Coastal Engineering Projects

The SAFMC establishes the following general policies related to large-scale beach dredge and fill and related projects, to clarify and augment the general policies already adopted in the Habitat Plan and Comprehensive Habitat Amendment (SAFMC 1998a; SAFMC 1998b):

1) Projects should avoid, minimize and where possible offset damage to EFH and EFH-HAPCs.

2) Projects requiring expanded EFH consultation should provide detailed analyses of possible impacts to each type of EFH, with careful and detailed analyses of possible

impacts to EFH-HAPCs and state CHAs, including short and long-term, and population and ecosystem scale effects. Agencies with oversight authority should require expanded EFH consultation.

3) Projects requiring expanded EFH consultation should provide a full range of alternatives, along with assessments of the relative impacts of each on each type of EFH, HAPC and CHAs.

4) Projects should avoid impacts on EFH, HAPCs and CHAs that are shown to be avoidable through the alternatives analysis, and minimize impacts that are not.

5) Projects should include assessments of potential unavoidable damage to EFH and other marine resources, using conservative assumptions.

6) Projects should be conditioned on the avoidance of avoidable impacts, and should include compensatory mitigation for all reasonably predictable impacts to EFH, taking into account uncertainty about these effects. Mitigation should be local, up-front and in-kind, and should be adequately monitored, wherever possible.

7) Projects should include baseline and project-related monitoring adequate to document pre-project conditions and impacts of the projects on EFH.

8) All assessments should be based upon the best available science, and be appropriately conservative so follow and precautionary principles as developed for various federal and state policies.

9) All assessments should take into account the cumulative impacts associated with other beach dredge and fill projects in the region, and other large-scale coastal engineering projects that are geographically and ecologically related.

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SAFMC Policy Statement Concerning Energy Exploration, Development and Transportation

Policy Context

This document establishes the policies of the South Atlantic Fishery Management Council (SAFMC) regarding protection of the essential fish habitats (EFH) and habitat areas of particular concern (EFH-HAPCs) associated with energy exploration, development and transportation. The policies are designed to be consistent with the overall habitat protection policies of the SAFMC as formulated and adopted in the Habitat Plan (SAFMC, 1998a) and the Comprehensive EFH Amendment (SAFMC, 1998b) and the various FMPs of the Council.

The findings presented below assess the threats to EFH potentially posed by activities related to the energy development in offshore, coastal ocean and adjacent habitats, and the processes whereby those resources are placed at risk. The policies established in this document are designed to avoid, minimize and offset damage caused by these activities, in accordance with the general habitat policies of the SAFMC as mandated by law.

EFH At Risk from Energy Exploration, Development and Transportation Activities

The SAFMC finds:

1) That oil or gas drilling for exploration or development on or closely associated with Essential Fish Habitat (EFH) including Coral, Coral Reefs, and Live Hardbottom Habitat or Essential Fish Habitat - Habitat Areas of Particular Concern (EFH-HAPCs), or other special biological resources essential to commercial and recreational fisheries under Council jurisdiction, be prohibited.

2) That all facilities associated with oil and gas exploration, development, and transportation be designed to avoid impacts on coastal wetlands and sand sharing systems.

3) That adequate spill containment and cleanup equipment be maintained for all development and transportation facilities and, that the equipment be available on site within the trajectory time to land, and have industry post a bond to assure labor or other needed reserves.

4) That exploration and development activities should be scheduled to avoid northern right whales in coastal waters off Georgia and Florida as well as migrations of that species and other marine mammals off South Atlantic states.

5) That the EIS for any Lease Sale address impacts from activities specifically related to natural gas production, safety precautions which must be developed in the event of a discovery of a "sour gas" or hydrogen sulfide reserve, the potential for southerly transport of hydrocarbons to nearshore and inshore estuarine habitats resulting from the cross-shelf transport by Gulf Stream spin-off eddies. The EIS should also address the development of contingency plans to be implemented if problems arise due to the

very dynamic oceanographic conditions and the extremely rugged bottom, the need for and availability of onshore support facilities in coastal North and South Carolina, and an analysis of existing facilities and community services in light of existing major coastal developments.

Energy development activities have the potential to cause impacts to a variety of habitats across the shelf, including:

e) waters and benthic habitats near the drilling sites
f) waters between drilling sites
g) waters and benthic habitats in or near the sites and
h) waters and benthic habitats potentially affected as sediments move subsequent to deposition in fill areas.

6) Certain nearshore and offshore habitats are particularly important to the long-term viability of commercial and recreational fisheries under SAFMC management, and potentially threatened by oil and gas and other energy exploration, development, and transportation:

a) coral, coral reef and live bottom habitat
b) estuarine wetlands and
c) submerged aquatic vegetation.

7) Sections of South Atlantic waters potentially affected by these projects, both individually and collectively, have been identified as EFH or EFH-HAPC by the SAFMC. Potentially affected species and their EFH under federal management include (SAFMC, 1998):

a) summer flounder (various nearshore waters, including the surf zone and inlets; certain offshore waters)
b) bluefish (various nearshore waters, including the surf zone and inlets)
c) red drum (ocean high-salinity surf zones and unconsolidated bottoms in the nearshore)
d) many snapper and grouper species (live hardbottom from shore to 600 feet, and – for estuarine-dependent species [e.g., gag grouper and gray snapper] – unconsolidated bottoms and live hardbottoms to the 100 foot contour)
e) black sea bass (various nearshore waters, including unconsolidated bottom and live hardbottom to 100 feet, and hardbottoms to 600 feet)
f) penaeid shrimp (offshore habitats used for spawning and growth to maturity, and waters connecting to inshore nursery areas, including the surf zone and inlets)
g) coastal migratory pelagics [e.g., king mackerel, Spanish mackerel] (sandy shoals of capes and bars, barrier island ocean-side waters from the surf zone to the shelf break inshore of the Gulf Stream; all coastal inlets)
h) corals of various types (hard substrates and muddy, silt bottoms from the subtidal to the shelf break)

i) areas identified as EFH for Highly Migratory Species managed by the Secretary of Commerce (e.g., sharks: inlets and nearshore waters, including pupping and nursery grounds)

8) Many of the habitats potentially affected by these activities have been identified as EFH-HAPCs by the SAFMC. The general activity and specific fishery management plan is provided in parentheses:

a) all nearshore hardbottom areas - transportation and development (SAFMC, snapper grouper).
b) all coastal inlets - transportation (SAFMC, penaeid shrimp, red drum, and snapper grouper).
c) nearshore spawning sites transportation and development (SAFMC, penaeid shrimps, and red drum).
d) benthic *Sargassum* (SAFMC, snapper grouper).
e) from shore to the ends of the sandy shoals of Cape Lookout, Cape Fear, and Cape Hatteras, North Carolina; Hurl Rocks, South Carolina; *Phragmatopora* (worm reefs) reefs off the central coast of Florida and near shore hardbottom south of Cape Canaveral (SAFMC, coastal migratory pelagics).
f) Atlantic coast estuaries with high numbers of Spanish mackerel and cobia from ELMR, to include Bogue Sound, New River, North Carolina; Broad River, South Carolina (SAFMC, coastal migratory pelagics).
g) Florida Bay, Biscayne Bay, Card Sound, and coral hardbottom habitat from Jupiter Inlet through the Dry Tortugas, Florida (SAFMC, Spiny Lobster)
h) Hurl Rocks (South Carolina), The *Phragmatopoma* (worm reefs) off central east coast of Florida, nearshore (0-4 meters; 0-12 feet) hardbottom off the east coast of Florida from Cape Canaveral top Broward County); offshore (5-30 meters; 15-90 feet) hardbottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida; Biscayne National Park, Florida; and the Florida Keys National Marine Sanctuary (SAFMC, Coral, Coral Reefs and Live Hardbottom Habitat).
i) EFH-HAPCs designated for HMS species (e.g., sharks) in the South Atlantic region (NMFS, Highly Migratory Species).

9) Habitats likely to be affected by oil and gas exploration, development and transportation include many recognized in state level fishery management plans. Examples of these habitats include Critical Habitat Areas (CHAs) established by the North Carolina Marine Fisheries Commission, either in FMPs or in Coastal Habitat Protection Plans.

10) Recent work by scientists in east Florida has documented exceptionally important habitat values for nearshore, hardbottom used by over 500 species of fishes and invertebrates, including juveniles of many reef fishes. Equivalent scientific work is just beginning in other South Atlantic states, but life histories suggest that similar habitat use patterns will be found.

Threats to Marine and Estuarine Resources from Energy Exploration, Development and Transportation Activities

The SAFMC finds that Energy Exploration, Development and Transportation Activities threaten or potentially threaten EFH through the following mechanisms:

1. Direct mortality and displacement of organisms at and near drilling sites.
2. Elevated turbidity and deposition of fine sediments down-current from drilling sites.
3. Elevated turbidity in and near drilling sites.
4. Direct mortality occurring from oil spill from pipelines or from a vessel in transit near or close to inlet areas, of larvae, post-larvae, juveniles and adults of marine and estuarine organisms.
5. Alteration of long-term shoreline migration patterns (inducing further ecological cascades with consequences that are difficult to predict).

In addition, the interactions between cumulative and direct (sub-lethal) effects among the above factors certainly triggers non-linear impacts that are completely unstudied.

SAFMC Policies for Energy Exploration, Development and Transportation Activities

The SAFMC establishes the following general policies related to oil and gas exploration, development and transportation and related projects, to clarify and augment the general policies already adopted in the Habitat Plan and Comprehensive Habitat Amendment (SAFMC 1998a; SAFMC 1998b):

1) Projects should avoid, minimize and where possible offset damage to EFH and EFH-HAPCs.

2) Projects requiring expanded EFH consultation should provide detailed analyses of possible impacts to each type of EFH, with careful and detailed analyses of possible impacts to EFH-HAPCs and state CHAs, including short and long-term, and population and ecosystem scale effects. Agencies with oversight authority should require expanded EFH consultation.

3) Projects requiring expanded EFH consultation should provide a full range of alternatives, along with assessments of the relative impacts of each on each type of EFH, HAPC and CHAs.

4) Projects should avoid impacts on EFH, HAPCs and CHAs that are shown to be avoidable through the alternatives analysis, and minimize impacts that are not.

5) Projects should include assessments of potential unavoidable damage to EFH and other marine resources, using conservative assumptions.

6) Projects should be conditioned on the avoidance of avoidable impacts, and should include compensatory mitigation for all reasonably predictable impacts to EFH, taking

into account uncertainty about these effects. Mitigation should be local, up-front and in-kind, and should be adequately monitored, wherever possible.

7) Projects should include baseline and project-related monitoring adequate to document pre-project conditions and impacts of the projects on EFH.

8) All assessments should be based upon the best available science, and be appropriately conservative follow precautionary principles as developed for various federal and state policies.

9) All assessments should take into account the cumulative impacts associated with other energy exploration, development and transportation projects that are geographically and ecologically related.

10) Support application of existing standards and requirements regulating domestic and international transportation of energy products including regulated waste disposal and emissions which are intended to minimize negative impacts on and preserve environmental quality of the marine environment.

The SAFMC recommends the following concerns and issues be addressed by the MMS prior to approval of any application for a permit to drill any exploratory wells in any lease sales in the South Atlantic and that these concerns and issues also be included in a new Environmental Impact Statement (EIS) for any future Outer Continental Shelf (OCS) Leasing Plan:

1) Identification of the on-site fisheries resources, including both pelagic and benthic communities, that inhabit, spawn, or migrate through the lease sites with special focus on those specific lease blocks where industry has expressed specific interest in the pre-lease phases of the leasing process. Particular attention should be given to critical life history stages. Eggs and larvae are most sensitive to oil spills, and seismic exploration has been documented to cause mortality of eggs and larvae in close proximity.
2) Identification of on-site species designated as endangered, threatened, or of special concern, such as shortnose sturgeon, striped bass, blueback herring, American shad, sea turtles, marine mammals, pelagic birds, and all species regulated under federal fishery management plans.
3) Determination of impacts of all exploratory and development activities on the fisheries resources prior to MMS approval of any applications for permits to drill in the Exploratory Unit area, including effects of seismic survey signals on fish behavior, eggs and larvae; temporary preclusion from fishing grounds by exploratory drilling, and permanent preclusion from fishing grounds by production and transportation.
4) Identification of commercial and recreational fishing activities in the vicinity of the lease or Exploratory Unit area, their season of occurrence and intensity.
5) Determination of the physical oceanography of the area through field studies by MMS or the applicant, including on-site direction and velocity of currents and tides, sea states, temperature, salinity, water quality, wind storms frequencies, and intensities and icing conditions. Such studies must be required prior to approval of any exploration plan

submitted in order to have an adequate informational database upon which to base subsequent decision making on site-specific proposed activities.

6) Description of required existing and planned monitoring activities intended to measure environmental conditions, and provide data and information on the impacts of exploration activities in the lease area or the Exploratory Unit area.

7) Identification of the quantity, composition, and method of disposal of solid and liquid wastes and pollutants likely to be generated by offshore, onshore, and transportation operations associated with oil and gas exploration development and transportation.

8) Development of an oil spill contingency plan which includes oil spill trajectory analyses specific to the area of operations, dispersant-use plan including a summary of toxicity data for each dispersant, identification of response equipment and strategies, establishment of procedures for early detection and timely notification of an oil spill including a current list of persons and regulatory agencies to be notified when an oil spill is discovered, and well defined and specific actions to be taken after discovery of an oil spill.

9) Studies should include detailing seasonal surface currents and likely spill trajectories.

10) Mapping of environmentally sensitive areas (e.g., spawning aggregations of snappers and groupers); coral resources and other significant benthic habitats (e.g., tilefish mudflats) along the edge of the continental shelf (including the upper slope); the calico scallop, royal red shrimp, and other productive benthic fishing grounds; other special biological resources; and northern right whale calving grounds and migratory routes, and subsequent deletion from inclusion in the respective lease block(s).

11) Planning for oil and gas product transport should be done to determine methods of transport, pipeline corridors, and onshore facilities. Siting and design of these facilities as well as onshore receiving, holding, and transport facilities could have impacts on wetlands and endangered species habitats if they are not properly located.

12) Develop understanding of community dynamics, pathways, and flows of energy to ascertain accumulation of toxins and impacts on community by first order toxicity.

13) Determine shelf-edge down-slope dynamics and resource assessments to determine fates of contaminants due to the critical nature of canyons and steep relief to important fisheries (e.g., swordfish, billfish, and tuna).

14) Discussion of the potential adverse impacts upon fisheries resources of the discharges of all drill cuttings that may result from activities in, and all drilling muds that may be approved for use in the lease area or the Exploration Unit area including: physical and chemical effects upon pelagic and benthic species and communities including their spawning behaviors and effects on eggs and larval stages; effects upon sight feeding species of fish; and analysis of methods and assumptions underlying the model used to predict the dispersion and discharged muds and cuttings from exploration activities.

15) Discussion of secondary impacts affecting fishery resources associated with onshore oil and gas related development such as storage and processing facilities, dredging and dredged material disposal, roads and rail lines, fuel and electrical transmission line routes, waste disposal, and others.

<u>SAFMC Policy and Position on Previous Oil and Gas Exploration Proposals</u>

The SAFMC urged the Secretary of Commerce to uphold the 1988 coastal zone inconsistency determination of the State of Florida for the respective plans of exploration filed with Minerals Management Service (MMS) by Mobil Exploration and Producing North America, Inc. for Lease OCS-G6520 (Pulley Ridge Block 799) and by Union Oil Company of California for Lease OCS-G6491/6492 (Pulley Ridge Blocks 629 & 630). Both plans of exploration involved lease blocks lying within the lease area comprising the offshore area encompassed by Part 2 of Lease Sale 116, and south of 26° North latitude. The Council's objection to the proposed exploration activities was based on the potential degradation or loss of extensive live bottom and other habitat essential to fisheries under Council jurisdiction.

The SAFMC also supported North Carolina's determination that the plans of exploration filed with MMS by Mobil Exploration and Producing North America, Inc. for Lease OCS Manteo Unit are not consistent with North Carolina's Coastal Zone Management program.

The Council has expressed concern to the Outer Continental Shelf Leasing and Development Task Force about the proposed area and recommends that no further exploration or production activity be allowed in the areas subject to Presidential Task Force Review (the section of Sale 116 south of 26° N latitude).

The following section addresses the recommendations, concerns and issues expressed by the South Atlantic Council (Source: Memorandum to Regional Director, U.S. Fish and Wildlife Service, Atlanta, Georgia from Regional Director, Gulf of Mexico OCS Region dated October 27, 1995):

"The MMS, North Carolina, and Mobil entered into an innovative Memorandum of Understanding on July 12, 1990, in which the MMS agreed to prepare an Environmental Report (ER) on proposed drilling offshore North Carolina. The scope of the ER prepared by the MMS was more comprehensive than and EIS would be. The normal scoping process used in preparation of a NEPA-type document would not only "identify significant environmental issues deserving of study" but also "deemphasize insignificant issues, narrowing the scope" (40 CFR 1500.4) by scoping out issues not ripe for decisions.

Of particular interest to North Carolina are not the transient effects of exploration, but rather the downstream and potentially broader, long-term effects of production and development. The potential effects associated with production and development would normally be "scoped out" of the (EIS-type) document and would be the subject of extensive NEPA analysis only after the exploration phase proves successful, and the submittal of a full-scale production and development program has been received for review and analysis. The ER addressed three alternatives: the proposed Mobil plan to drill a single exploratory well, the no-action alternative and the alternative that the MMS approve the Mobil plan with specific restrictions (monitoring programs and restrictions on discharges). The ER also analyzes possible future activities, such as development and production, and the long-term environmental and socioeconomic effects associated with such activities. The MMS assured North Carolina that all of the State's comments and concerns would be addressed in the Final ER (MMS, 1990).

The MMS also funded a Literature Synthesis study (USDOI MMS, 1993a) and a Physical Oceanography study (USDOI MMS, 1994), both recommended by the Physical

Oceanography Panel and the Environmental Sciences Review Panel (ESRP). Mobil also submitted a draft report to the MMS titled, "Characterization of Currents at Manteo Block 467 off Cape Hatteras, North Carolina." The MMS also had a Cooperative Agreement with the Virginia Institute of Marine Science to fund a study titled, "Seafloor Survey in the Vicinity of the Manteo Prospect Offshore North Carolina" (USDOI MMS, 1993b). The MMS had a Cooperative Agreement with East Carolina University to conduct a study titled, "Coastal North Carolina Socioeconomic Study" (USDOI MMS, 1993c). The above-mentioned studies were responsive to the ESRP's recommendations as well as those of the SAFMC and the State of North Carolina.

Copies of these studies can be acquired from the address below:
Minerals Management Service, Technical Communication Services
MS 4530 381 Elden Street
Herndon, VA 22070-4897 (703) 787-1080

References

SAFMC. 1998a. Final habitat plan for the South Atlantic region: Essential Fish Habitat requirements for fishery management plans of the South Atlantic Fishery Management Council. 457 pp plus appendices.

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SAFMC Policy Statement Concerning Alterations to Riverine, Estuarine and Nearshore Flows

Policy Context

This document establishes the policies of the South Atlantic Fishery Management Council (SAFMC) regarding protection of the essential fish habitats (EFH) and habitat areas of particular concern (EFH-HAPCs) associated with alterations of riverine, estuarine and nearshore flows. Such hydrologic alterations occur through activities such as flood control reservoir and hydropower operations, water supply and irrigation withdrawals, deepening of navigation al channels and inlets, and other modifications to the normative hydrograph. The policies are designed to be consistent with the overall habitat protection policies of the SAFMC as formulated and adopted in the Habitat Plan (October 1998) and the Comprehensive EFH Amendment (October 1998).

The findings presented below assess the threats to EFH potentially posed by activities related to the alteration of flows in southeast rivers, estuaries and nearshore ocean habitats, and the processes whereby those resources are placed at risk. The policies established in this document are designed to avoid, minimize and offset damage caused by these activities, in accordance with the general habitat policies of the SAFMC as mandated by law.

EFH At Risk from Flow-Altering Activities

The SAFMC finds:

6) In general, the array of existing and proposed flow-altering projects being considered for the Southeastern United States for states with river systems that drain into the South Atlantic Fishery Management Council area of jurisdiction together constitutes a real and significant threat to EFH under the jurisdiction of the SAFMC.

7) The cumulative effects of these projects have not been adequately assessed, including impacts on public trust marine and estuarine resources (especially diadromous species), use of public trust waters, public access, state and federally protected species, state critical habitat, SAFMC-designated EFH and EFH-HAPCs.

8) Individual proposals resulting in hydrologic alterations rarely provide adequate assessments or consideration of potential damage to fishery resources under state and federal management. Historically, emphasis has been placed on the need for human water supply, hydropower generation, agricultural irrigation, flood control and other human uses. Environmental considerations have been dominated by compliance with limitations imparted by the Endangered Species Act for shortnose sturgeon, and/or through provisions of Section 18 of the Federal Power Act, as administered by the Federal Energy Regulatory Commission, which applies to the provision of passage for anadromous species, as well as the provisions of the Fish and Wildlife Act.

9) Opportunities to avoid and minimize impacts of hydrologic alterations on fishery resources, and offsets for unavoidable impacts have rarely been proposed or implemented.

10) Hydrologic alterations have caused impacts to a variety of habitats including:

i) waters, wetlands and benthic habitats near the discharge and withdrawal points, especially where such waters are used for spawning by anadromous species;
j) waters, wetlands and benthic habitats in the area downstream of discharge or withdrawal points;
k) waters wetlands and benthic habitats in receiving estuaries of southeast rivers; and
l) waters and benthic habitats of nearshore ocean habitats receiving estuarine discharge.

6) Certain riverine, estuarine and nearshore habitats are particularly important to the long-term viability of commercial and recreational fisheries under SAFMC management, and threatened by large-scale, long-term or frequent hydrologic alterations:

e) freshwater riverine reaches and/or wetlands used for anadromous spawning;
f) downstream freshwater, brackish and mid-salinity portions of rivers and estuaries serving as nursery areas for anadromous and estuarine-dependant species; and
g) nearshore oceanic habitats off estuary mouths.

7) Large sections of South Atlantic waters potentially affected by these projects, both individually and collectively, have been identified as EFH or EFH-HAPC by the SAFMC**,** as well as the Mid-Atlantic Fishery Management Council (MAFMC) in the case of North Carolina. Potentially affected species and their EFH under federal management include (SAFMC, 1998) include:

a) summer flounder (various nearshore waters, including the surf zone and inlets; certain offshore waters).
b) bluefish (various nearshore waters, including the surf zone and inlets)
c) red drum (ocean high-salinity surf zones and unconsolidated bottoms in the nearshore).
d) many snapper and grouper species (live hard bottom from shore to 600 feet, and – for estuarine-dependent species [e.g., gag grouper and gray snapper] – unconsolidated bottoms and live hard bottoms to the 100 foot contour).
e) black sea bass (various nearshore waters, including unconsolidated bottom and live hard bottom to 100 feet, and hard bottoms to 600 feet).
f) penaeid shrimp (offshore habitats used for spawning and growth to maturity, and waters connecting to inshore nursery areas, including the surf zone and inlets).
g) coastal migratory pelagics (e.g., king mackerel, Spanish mackerel) (sandy shoals of capes and bars, barrier island ocean-side waters from the surf zone to the shelf break inshore of the Gulf Stream; all coastal inlets).
h) corals of various types (hard substrates and muddy, silt bottoms from the subtidal to the shelf break).
i) areas identified as EFH for Highly Migratory managed by the Secretary of Commerce (e.g., sharks / inlets and nearshore waters, including pupping and nursery grounds).

8) Projects which entail hydrologic alterations also threaten important fish habitats for anadromous species under federal, interstate and state management (in particular, riverine spawning habitats, riverine and estuarine habitats, including state designated areas - e.g. Primary and Secondary Nursery Areas of North Carolina), as well as essential overwintering grounds in nearshore and offshore waters. All diadromous species are under management by the Atlantic States Marine Fisheries Commission and the states. The SAFMC also identified essential habitats of anadromous and catadromous species in the region (inlets and nearshore waters).

9) Numerous habitats that have been by these projects causing hydrologic alterations have been identified as EFH-HAPCs by the SAFMC. The specific fishery management plan is provided in parentheses:

a) all nearshore hard bottom areas (SAFMC, snapper-grouper).
b) all coastal inlets (SAFMC, penaeid shrimps, red drum, and snapper-grouper).
c) near-shore spawning sites (SAFMC, penaeid shrimps, and red drum).
d) benthic *Sargassum* (SAFMC, snapper-grouper).
e) from shore to the ends of the sandy shoals of Cape Lookout, Cape Fear, and Cape Hatteras, North Carolina; Hurl Rocks, South Carolina; *Phragmatopora* (worm reefs) reefs off the central coast of Florida and near-shore hard-bottom south of Cape Canaveral (SAFMC, coastal migratory pelagics).
f) Atlantic coast estuaries with high numbers of Spanish mackerel and Cobia from ELMR, to include Bogue Sound, New River, North Carolina; Broad River, South Carolina (SAFMC, coastal migratory pelagics).
g) Florida Bay, Biscayne Bay, Card Sound, and coral hard bottom habitat from Jupiter Inlet through the Dry Tortugas, Florida (SAFMC, Spiny Lobster)
h) Hurl Rocks (South Carolina), The Phragmatopoma (worm reefs) off central east coast of Florida, nearshore (0-4 meters; 0-12 feet) hard bottom off the east coast of Florida from Cape Canaveral top Broward County); offshore (5-30 meters; 15-90 feet) hard bottom off the east coast of Florida from Palm Beach County to Fowey Rocks; Biscayne Bay, Florida; Biscayne National Park, Florida; and the Florida Keys National Marine Sanctuary (SAFMC, Coral, Coral Reefs and Live hard Bottom Habitat).
i) EFH-HAPCs designated for HMS species (e.g., sharks) in the South Atlantic region (NMFS, Highly Migratory Species).

10) Habitats likely to be affected by projects which alter hydrologic regimes include many recognized in state level fishery management plans. Examples of these habitats include Critical Habitat Areas established by the North Carolina Marine Fisheries Commission, either in FMPs or in Coastal Habitat Protection Plans.

Threats to Marine and Estuarine Resources from Hydrologically-Altering Activities

The SAFMC finds that activities which alter normative hydrologic regimes of rivers, estuaries, inlets and nearshore oceanic habitats threaten or potentially threaten EFH through the following mechanisms:

Direct mortality of organisms at withdrawal points through hydrologic regimes

In addition, the interactions between cumulative and direct (sub-lethal) effects among the above factors certainly trigger non-linear impacts that are completely unstudied.

SAFMC Policies for Flow-altering Projects

The SAFMC establishes the following general policies related projects resulting in hydrologic alterations, to clarify and augment the general policies already adopted in the Habitat Plan and Comprehensive Habitat Amendment (SAFMC 1998a; SAFMC 1998b):

1) Projects should avoid, minimize and where possible offset damage to EFH and EFH-HAPCs.

2) Projects requiring expanded EFH consultation should provide detailed analyses of possible impacts to each type of EFH, with careful and detailed analyses of possible impacts to EFH-HAPCs and state Critical Habitat Areas (CHAs), including short and long term, and population and ecosystem scale effects. Agencies with oversight authority should require expanded EFH consultation.

3) Projects requiring expanded EFH consultation should provide a full range of alternatives, along with assessments of the relative impacts of each on each type of EFH, HAPC and CHAs.

4) Projects should avoid impacts on EFH, HAPCs and CHAs that are shown to be avoidable through the alternatives analysis, and minimize impacts that are not.

5) Projects should include assessments of potential unavoidable damage to EFH and other marine resources, using conservative assumptions.

6) Projects should be conditioned on the avoidance of avoidable impacts, and should include compensatory mitigation for all reasonably predictable impacts to EFH, taking into account uncertainty about these effects. Mitigation should be local, up-front and in-kind, and should be adequately monitored, wherever possible.

7) Projects should include baseline and project-related monitoring adequate to document pre-project conditions and impacts of the projects on EFH.

8) All assessments should be based upon the best available science, and be appropriately conservative so follow and precautionary principles as developed for various federal and state policies.

9) All assessments should take into account the cumulative impacts associated with other projects in the same southeast watershed.

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SAFMC Policy for Protection and Enhancement of Marine Submerged Aquatic Vegetation (SAV) Habitat.

The South Atlantic Fishery Management Council (SAFMC) and the Habitat and Environmental Protection Advisory Panel has considered the issue of the decline of Marine Submerged Aquatic Vegetation SAV (or seagrass) habitat in Florida and North Carolina as it relates to Council habitat policy. Subsequently, the Council's Habitat Committee requested that the Habitat Advisory Panel develop the following policy statement to support Council efforts to protect and enhance habitat for managed species.

Description and Function:

In the South Atlantic region, SAV is found primarily in the states of Florida and North Carolina where environmental conditions are ideal for the propagation of seagrasses. The distribution of SAV habitat is indicative of its importance to economically important fisheries: in North Carolina, total SAV coverage is estimated to be 200,000 acres; in Florida, the total SAV coverage is estimated to be 2.9 million acres. SAV serves several valuable ecological functions in the marine systems where it occurs. Food and shelter afforded by SAV result in a complex and dynamic system that provides a primary nursery habitat for various organisms that is important both to the overall system ecology as well as to commercial and recreationally important fisheries. SAV habitat is valuable both ecologically as well as economically; as feeding, breeding, and nursery ground for numerous estuarine species, SAV provides for rich ecosystem diversity. Further, a number of fish and shellfish species, around which is built several vigorous commercial and recreational fisheries, rely on SAV habitat for a least a portion of their life cycles. For more detailed discussion, please see Appendix 1.

Status:

SAV habitat is currently threatened by the cumulative effects of overpopulation and consequent commercial development and recreation in the coastal zone. The major anthropogenic threats to SAV habitat include:

(1) mechanical damage due to:

(a) propeller damage from boats,
(b) bottom-disturbing fish harvesting techniques,
(c) dredging and filling;

(2) biological degradation due to:

(a) water quality deterioration by modification of temperature, salinity, and light attenuation regimes;
(b) addition of organic and inorganic chemicals.

SAV habitat in both Florida and North Carolina has experienced declines from both natural and anthropogenic causes. However, conservation measures taken by state and federal agencies have produced positive results. The national Marine Fisheries Service has produced maps of SAV habitat in the Albemarle-Pamlico Sound region of North Carolina to help stem the loss of this critical habitat. The threats to this habitat and the potential for successful conservation measures highlight the need to address the decline of SAV. Therefore, the South Atlantic Council recommends immediate and direct action be taken to stem the loss of this essential habitat. For more detailed discussion, please see Appendix 2.

Management:

Conservation of existing SAV habitat is critical to the maintenance of the living resources that depend on these systems. A number of federal and state laws and regulations apply to modifications, either direct or indirect, to SAV habitat. However, to date the state and federal regulatory process has accomplished little to slow the decline of SAV habitat. Furthermore, mitigative measures to restore or enhance impacted SAV have met with little success. These habitats cannot be readily restored; the South Atlantic Council is not aware of any seagrass restoration project that has ever prevented a net loss of SAV habitat. It has been difficult to implement effective resource management initiatives to preserve existing seagrass habitat resources due to the lack of adequate documentation and specific cause/effect relationships. (for more detailed discussion, please see Appendix 3)

Because restoration/enhancement efforts have not met with success, the South Atlantic Council considers it imperative to take a directed and purposeful action to protect remaining SAV habitat. The South Atlantic Council strongly recommends that a comprehensive strategy to address the disturbing decline in SAV habitat in the South Atlantic region. Furthermore, as a stepping stone to such a long-term protection strategy, the South Atlantic Council recommends that a reliable status and trend survey be adopted to verify the scale of local declines of SAV.

The South Atlantic Council will address the decline of SAV, and consider establishing specific plans for revitalizing the SAV resources of the South Atlantic region. This may be achieved by the following integrated triad of efforts:

Planning:

- The Council promotes regional planning which treats SAV as a integral part of an ecological system.

- The Council supports comprehensive planning initiatives as well as interagency coordination and planning on SAV matters.

- The Council recommends that the Habitat Advisory Panel members actively seek to involve the Council in the review of projects which will impact, either directly or indirectly, SAV habitat resources.

Monitoring and Research:

- Periodic surveys of SAV in the region are required to determine the progress toward the goal of a net resource gain.

- The Council supports efforts to
  (1) standardize mapping protocols,
  (2) develop a Geographic Information System databases for essential habitat including seagrass, and
  (3) research and document causes and effects of SAV decline including the cumulative impacts of shoreline development.

Education and Enforcement:

- The Council supports education programs designed to heighten the public's awareness of the importance of SAV. An informed public will provide a firm foundation of support for protection and restoration efforts.

- Existing regulations and enforcement need to be reviewed for their effectiveness.

- Coordination with state resource and regulatory agencies should be supported to assure that existing regulations are being enforced.

SAFMC SAV Policy Statement- Appendix 1

DESCRIPTION AND FUNCTION

Worldwide, Submerged Aquatic Vegetation (SAV) constitutes one of the most conspicuous and common shallow-water habitat types. These angiosperms have successfully colonized standing and flowing fresh, brackish, and marine waters in all climatic zones, and most are rooted in the sediment. Marine SAV beds occur in the low intertidal and subtidal zones and may exhibit a wide range of habitat forms, from extensive collections of isolated patches to unbroken continuous beds. The bed is defined by the presence of either aboveground vegetation, its associated root and rhizome system (with living meristem), or the presence of a seed bank in the sediments, as well as the sediment upon which the plant grows or in which the seed back resides. In the case of patch beds, the unvegetated sediment among the patches is considered seagrass habitat as well.

There are seven species of seagrass in Florida's shallow coastal areas: turtle grass (*Thalassia testudium*); manatee grass (*Syringodium filiforme*); shoal grass (*Halodule wrightii*); star grass (*Halophila engelmanni*); paddle grass (*Halophila decipiens*); and Johnson's seagrass (*Halophila johnsonii*) (See distribution maps in Appendix 4). Recently, *H. johnsonii* has been proposed for listing by the National Marine Fisheries Service as an endangered plant species. Areas of seagrass concentration along Florida's east coast are Mosquito Lagoon, Banana River, Indian River Lagoon, Lake Worth and Biscayne Bay. Florida Bay, located between the Florida Keys and the mainland, also has an abundance of seagrasses, but is currently experiencing an unprecedented decline in SAV distribution.

The three dominant species found in North Carolina are shoalgrass (*Halodule wrightii)*, eelgrass (*Zostera marina*), and widgeongrass (*Ruppia maritima*). Shoalgrass, a subtropical species has its northernmost distribution at Oregon Inlet, North Carolina. Eelgrass, a temperate species, has its southernmost distribution in North Carolina. Areas of seagrass concentration in North Carolina are southern and eastern Pamlico Sound, Core Sound, Back Sound, Bogue Sound and the numerous small southern sounds located behind the beaches in Onslow, Pender, Brunswick, and New Hanover Counties (See distribution maps in Appendix 4).

Seagrasses serve several valuable ecological functions in the marine estuarine systems where they occur. Food and shelter afforded by the SAV result in a complex and dynamic system that provides a primary nursery habitat for various organisms that are important both ecologically and to commercial and recreational fisheries. Organic matter produced by these seagrasses is transferred to secondary consumers through three pathways: herbivores that consume living plant matter; detritivores that exploit dead matter; and microorganisms that use seagrass-derived particulate and dissolved organic compounds. The living leaves of these submerged plants also provide a substrate for the attachment of detritus and epiphytic organisms, including bacteria, fungi, meiofauna, micro- and marcroalgae, macroinvertebrates. Within the seagrass system, phytoplankton also are present in the water column, and macroalgae and microalgae are associated with the sediment. No less important is the protection afforded by the variety of living spaces in the tangled leaf canopy of the grass bed itself. In addition to biological benefits, the SAVs also cycle nutrients and heavy metals in the water and sediments, and dissipate wave energy (which reduces shoreline erosion and sediment resuspension).

There are several types of association fish may have with the SAVs. Resident species typically breed and carry out much of their life history within the meadow (e.g., gobiids and syngnathids). Seasonal residents typically breed elsewhere, but predictably utilize the SAV during a portion of their life cycle, most often as a juvenile nursery ground (e.g., sparids and lutjanids). Transient species can be categorized as those that feed or otherwise utilize the SAV only for a portion of their daily activity, but in a systematic or predictable manner (e.g., haemulids).

In Florida many economically important species utilize SAV beds as nursery and/or spawning habitat. Among these are spotted seatrout (*Cynoscion nebulosus*), grunts (Heaemulids), snook (*Centropomus sp.*), bonefish (*Albula vulpes*), tarpon (*Megalops atlanticus*) and several species of snapper (Lutianids) and grouper (Serranids). Densities of invertebrate organisms are many times greater in seagrass beds than in bare

sand habitat. Penaeid shrimp, spiny lobster (*Panulirus argus*), and bay scallops (*Argopecten irradians*) are also dependent on seagrass beds.

In North Carolina 40 species of fish and invertebrates have been captured on seagrass beds. Larval and juvenile fish and shellfish including gray trout (*Cynoscion regalis*), red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), mullet (*Mugil cephalus)*, spot (*Leiostomus xanthurus*), pinfish (*Orthopristis chrysoptera*), gag (*Mycteroperca microlepis*), white grunt (*Haemulon plumieri*), silver perch (*Bairdiella chrysoura*), summer flounder (*Paralichthys dentatus*), southern flounder (*P. lethostigma*), blue crabs (*Callinectes sapidus*), hard shell clams (*Mercenaria mercenaria*), and bay scallops (*Argopecten irradains*) utilize the SAV beds as nursery areas. They are the sole nursery grounds for bay scallops in North Carolina. SAV meadows are also frequented by adult spot, spotted seatrout, bluefish (*Pomatomus saltatrix*), menhaden (*Brevortia tyrannus*), summer and southern flounder, pink and brown shrimp, hard shell clams, and blue crabs. Offshore reef fishes including black sea bass (*Centropristis striata*), gag (*Mycteroperca microlepis*), gray snapper (*Lutjanus griseus*), lane snapper (*Lutjanus synagris*), mutton snapper (*Lutjanus annalis*), and spottail pinfish (*Diplodus holbrooki*). Ospreys, egrets, herons, gulls and terns feed on fauna in SAV beds, while swans, geese, and ducks feed directly on the grass itself. Green sea turtles (*Chelonia mydas*) also utilize seagrass beds, and juveniles may feed directly on the seagrasses.

SAFMC SAV Policy Statement- Appendix 2

Status

The SAV habitat represents a valuable natural resource which is now threatened by overpopulation in coastal areas. The major anthropogenic activities that impact seagrass habitats are: 1) dredging and filling, 2) certain fish harvesting techniques and recreational vehicles, 3) degradation of water quality by modification of normal temperature, salinity, and light regimes, and 4) addition of organic and inorganic chemicals. Although not caused by man, disease ("wasting disease" of eelgrass) has historically been a factor. Direct causes such as dredging and filling, impacts of bottom disturbing fishing gear, and impacts of propellers and boat wakes are easily observed, and can be controlled by wise management of our seagrass resources (See Appendix 3). Indirect losses are more subtle and difficult to assess. These losses center around changes in light availability to the plants by changes in turbidity and water color. Other indirect causes of seagrass loss may be ascribed to changing hydrology which may in turn affect salinity levels and circulation. Reduction in flushing can cause an increase in salinity and the ambient temperature of a water body, stressing the plants. Increase in flushing can mean decreased salinity and increased turbidity and near-bottom mechanical stresses which damage or uproot plants.

Increased turbidity and decreasing water transparency are most often recognized as the cause of decreased seagrass growth and altered distribution of the habitats. Turbidity may result from upland runoff, either as suspended sediment or dissolved nutrients. Reduced transparency due to color is affected by freshwater discharge. The introduction of additional nutrients from terrigenous sources often leads to plankton blooms and increased epiphytization of the plants, further reducing light to the plants.

Groundwater enriched by septic systems also may infiltrate the sediments, water column, and near-shore seagrass beds with the same effect. Lowered dissolved oxygen is detrimental to invertebrate and vertebrate grazers. Loss of these grazers results in overgrowth by epiphytes.

Large areas of Florida where seagrasses were abundant have now lost these beds from both natural and man-induced causes. (This is not well documented on a large scale except in the case of Tampa Bay). One of these depleted areas is Lake Worth in Palm Beach County. Here, dredge and fill activities, sewage disposal and stormwater runoff have almost eliminated this resource. North Biscayne Bay lost most of its seagrasses from urbanization. The Indian River Lagoon has lost many seagrass beds from stormwater runoff has caused a decrease in water transparency and reduced light penetration. Many seagrass beds in Florida have been scarred from boat propellers disrupting the physical integrity of the beds. Vessel registrations, both commercial and recreational, have tripled from 1970-71 (235, 293) to 1992-93 (715,516). More people engaged in marine activities having an effect on the limited resources of fisheries and benthic communities, Florida's assessment of dredging/propeller scar damage indicates that Dade, Lee, Monroe, and Pinellas Counties have the most heavily damaged seagrass beds. Now Florida Bay, which is rather remote from human population concentrations, is experiencing a die-off of seagrasses, the cause of which has not yet been isolated. Cascading effects of die-offs cause a release of nutrients resulting in algal blooms which, in turn, adversely affect other seagrass areas, and appear to be preventing recolonization and natural succession in the bay. It appears that Monroe County's commercial fish and shellfish resources, with a dockside landing value of $50 million per year, is in serious jeopardy.

In North Carolina total SAV coverage is estimated at 200,000 acres. Compared to the state's brackish water SAV community, the marine SAVs appear relatively stable. The drought and increased water clarity during the summer of 1986 apparently caused an increase in SAV abundance in southeastern Pamlico Sound and a concomitant increase in bay scallop densities. Evidence is emerging, however, that characteristics of "wasting disease" are showing up in some of the eelgrass populations in southern Core Sound, Back Sound, and Bogue Sound. The number of permits requested for development activities that potentially impact SAV populations is increasing. The combined impacts of a number of small, seemingly isolated activities are cumulative and can lead to the collapse of large seagrass biosystems. Also increasing is evidence of the secondary removal of seagrasses. Clam-kicking (the harvest of hard clams utilizing powerful propeller wash to dislodge the clams from the sediment) is contentious issue within the state of North Carolina. The scientific community is convinced that mechanical harvesting of clams damages SAV communities. The scallop fishery also could be harmed by harvest-related damage to eelgrass meadows.

SAFMC Policy Statement Concerning Dredging and Dredge Material Disposal Activities

Ocean Dredged Material Disposal Sites (ODMDS) and SAFMC Policies.

The shortage of adequate upland disposal sites for dredged materials has forced dredging operations to look offshore for sites where dredged materials may be disposed. These Ocean Dredged Material Disposal Sites (ODMDSs) have been designated by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (COE) as suitable sites for disposal of dredged materials associated with berthing and navigation channel maintenance activities. The South Atlantic Fishery Management Council (SAFMC; the Council) is moving to establish its presence in regulating disposal activities at these ODMDSs. Pursuant to the Magnuson Fishery Conservation and Management Act of 1976 (the Magnuson Act), the regional fishery management Councils are charged with management of living marine resources and their habitat within the 200 mile Exclusive Economic Zone (EEZ) of the United States. Insofar as dredging and disposal activities at the various ODMDSs can impact fishery resources or essential habitat under Council jurisdiction, the following policies address the Council's role in the designation, operation, maintenance, and enforcement of activities in the ODMDSs:

The Council acknowledges that living marine resources under its jurisdiction and their essential habitat may be impacted by the designation, operation, and maintenance of ODMDSs in the South Atlantic. The Council may review the activities of EPA, COE, the state Ports Authorities, private dredging contractors, and any other entity engaged in activities which impact, directly or indirectly, living marine resources within the EEZ.

The Council may review plans and offer comments on the designation, maintenance, and enforcement of disposal activities at the ODMDSs.

ODMDSs should be designated or redesignated so as to avoid the loss of live or hard bottom habitat and minimize impacts to all living marine resources.

Notwithstanding the fluid nature of the marine environment, all impacts from the disposal activities should be contained within the designated perimeter of the ODMDSs.

The final designation of ODMDSs should be contingent upon the development of suitable management plans and a demonstrated ability to implement and enforce that plan. The Council encourages EPA to press for the implementation of such management plans for all designated ODMDSs.

All activities within the ODMDSs are required to be consistent with the approved management plan for the site.

The Council's Habitat and Environmental Protection Advisory Panel when requested by the Council will review such management plans and forward comment to the Council. The Council may review the plans and recommendations received from the advisory sub-panel and comment to the appropriate agency. All federal agencies and entities receiving a comment or recommendation from the Council will provide a detailed written response to the Council regarding the matter pursuant to 16 U.S.C. 1852 (i). All other agencies and entities receiving a comment or recommendation from the Council should provide a detailed written response to the Council regarding the matter, such as is required for federal agencies pursuant to 16 U.S.C. 1852 (i).

ODMDSs management plans should indicate appropriate users of the site. These plans should specify those entities/ agencies which may use the ODMDSs, such as port

authorities, the U.S. Navy, the Corps of Engineers, etc. Other potential users of the ODMDSs should be acknowledged and the feasibility of their using the ODMDSs site should be assessed in the management plan.

Feasibility studies of dredge disposal options should acknowledge and incorporate ODMDSs in the larger analysis of dredge disposal sites within an entire basin or project. For example, Corps of Engineers analyses of existing and potential dredge disposal sites for harbor maintenance projects should incorporate the ODMDSs as part of the overall analysis of dredge disposal sites.

The Council recognizes that EPA and other relevant agencies are involved in managing and/or regulating the disposal of all dredged material. The Council recognizes that disposal activities regulated under the Ocean Dumping Act and dredging/filling carried out under the Clean Water Act have similar impacts to living marine resources and their habitats. Therefore, the Council urges these agencies apply the same strict policies to disposal activities at the ODMDSs. These policies apply to activities including, but not limited to, the disposal of contaminated sediments and the disposal of large volumes of fine-grained sediments. The Council will encourage strict enforcement of these policies for disposal activities in the EEZ. Insofar as these activities are relevant to disposal activities in the EEZ, the Council will offer comments on the further development of policies regarding the disposal/ deposition of dredged materials.

The Ocean Dumping Act requires that contaminated materials not be placed in an approved ODMDS. Therefore, the Council encourages relevant agencies to address the problem of disposal of contaminated materials. Although the Ocean Dumping Act does not specifically address inshore disposal activities, the Council encourages EPA and other relevant agencies to evaluate sites for the suitability of disposal and containment of contaminated dredged material. The Council further encourages those agencies to draft management plans for the disposal of contaminated dredge materials. A consideration for total removal from the basin should also be considered should the material be contaminated to a level that it would have to be relocated away from the coastal zone.

Offshore and Nearshore Underwater Berm Creation

The use of underwater berms in the South Atlantic region has recently been proposed as a disposal technique that may aid in managing sand budgets on inlet and beachfront areas. Two types of berms have been proposed to date, one involving the creation of a long offshore berm, the second involving the placement of underwater berms along beachfronts bordering an inlet. These berms would theoretically reduce wave energy reaching the beaches and/or resupply sand to the system.

The Council recognizes offshore berm construction as a disposal activity. As such, all policies regarding disposal of dredged materials shall apply to offshore berm construction. Research should be conducted to quantify larval fish and crustacean transport and use of the inlets prior to any consideration of placement of underwater berms. Until the impacts of berm creation in inlet areas on larval fish and crustacean transport is determined, the Council recommends that disposal activities should be confined to approved ODMDSs. Further, new offshore and near shore underwater berm creation activities should be reviewed under the most rigorous criteria, on a case-by-case basis.

Open Water Disposal

The SAFMC is opposed to the open water disposal of dredged material into aquatic systems which may adversely impact habitat that fisheries under Council jurisdiction are dependent upon. The Council urges state and federal agencies, when reviewing permits considering open water disposal, to identify the direct and indirect impacts such projects could have on fisheries habitat.

The SAFMC concludes that the conversion of one naturally functioning aquatic system at the expense of creating another (marsh creation through open water disposal) must be justified given best available information.

Current Catch Limits, Catch Targets, and Allocations and Ones Proposed in Amendment 17B for Nine Species Managed by the Council

Table 1. Overfishing Level (OFL) and Acceptable Biological Catch (ABC) Recommendations from SSC, Including the Annual Catch Limits In Place and Proposed In Amendment 17B.

Species	OFL Recommendation from SSC	ABC Recommendation from SSC	Current ACLs	ACLs In Preferred Alternatives in 17B
Black grouper	none specified	none specified	None	Comm Aggregate ACL (black, red, gag) = 662,403 lbs gw Rec Aggregate ACL = 648,663 lbs gw
Black sea bass	OFL = Yield at MFMT	ABC = rebuilding plan 847,000 lbs ww 717,797 lbs gw	309,000 lbs gw (comm.) 409,000 lbs gw (rec.)	No change proposed
Gag	OFL = Yield at MFMT	805,000 lbs gw (landed catch) 885,000 lbs gw (total kill)	353,940 lbs gw (comm.) 340,060 lbs gw (rec.)	KEEP 353,940 lbs gw (comm.) 340,060 lbs gw (rec.) IN ADDITION Comm Aggregate ACL (black, red, gag) = 662,403 lbs gw Rec Aggregate ACL = 648,663 lbs gw
Golden tilefish	none specified	none specified	295,000 lbs gw (comm.) (F_{MSY} level)	282,819 lbs gw (comm.) 1,578 fish (rec)
Red grouper	none specified	none specified	None	Comm Aggregate ACL (black, red, gag) = 662,403 lbs gw Rec Aggregate ACL = 648,663 lbs gw
Snowy grouper	OFL = Yield at MFMT	ABC = rebuilding plan[4] 102,960 lbs ww 87,254 lbs gw	82,900 lbs gw (comm.) 523 fish (rec)	No change proposed
Speckled hind	SSC Recommendation=Unknown	0 (landings only)	None	0 (landings only) comm. and rec.
Vermilion snapper	none specified	1,078,000 lbs ww (landed catch)[6] 1,109,000 lbs ww (total kill)	315,523 lb gw (Jan-June) (comm.) 302,523 lbs gw (July-Dec) (comm.) 307,315 lbs gw (rec.)=TOTAL **925,361 lbs gw**	No change proposed
Warsaw grouper	SSC Recommendation=Unknown	0 (landings only)	None	0 (landings only) comm. and rec.

Table 2. Current Accountability Measures (AM) and ones proposed in Amendment 17B as outlined in preferred alternatives. The AMs proposed in the amendment are in bold while those that are current are not.

ACCOUNTABILITY MEASURES				
Species	Commercial		Recreational	
	In-Season	Overage	In-Season	Overage
Speckled hind	Closure[1]	Closure[1]	Closure[1]	Closure[1]
Warsaw grouper	Closure[1]	Closure[1]	Closure[1]	Closure[1]
Snowy Grouper	Close fishery when quota projected to be met		None	**Shorten length of following fishing season to ensure landings do not exceed rec. ACL the following year; use 3 year running average**
Golden tilefish	Close fishery when quota projected to be met	None	None	**Shorten length of following fishing season to ensure landings do not exceed rec. ACL the following year; use 3 year running average**[2]
Gag	Close SWG fishery when gag ACL is projected to be met; **in addition to gag ACL, create black, red, and gag ACL. Close SWG when either is met first.**	None	**If gag is overfished and ACL is met, close SWG fishery. Create black, red, and gag ACL. If gag, black, or red is overfished, close SWG fishery.**	**Independent of stock status, if individual species recreational ACL is exceeded, reduce species recreational ACL the following year by overage. Use 3 year running average.**[2]
Black grouper	Close SWG fishery when gag ACL is projected to be met; **in addition to gag ACL, create black, red, and gag ACL. Close SWG when either is met first.**	None		
Red grouper	Close SWG fishery when gag ACL is projected to be met; **in addition to gag ACL, create black, red, and gag ACL. Close SWG when either is met first.**	None		
Black sea bass	Close fishery when quota projected to be met	None	**If species is overfished and ACL is met, prohibit harvest of species.**	
Vermilion snapper	Close fishery when quota projected to be met	None		

[1]The deepwater closure may be considered as a type of AM.
[2]The alternative reads: Alternative 4 (Preferred). For black grouper, black sea bass, gag, red grouper, and vermilion snapper, compare recreational ACL with 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 three-year running average.

Table 3. Current allocations (including the amendment they were implemented through) and ones proposed in Amendment 17B as outlined in the preferred alternatives.

Species	**ALLOCATIONS**	
	Current	**Proposed in 17B**
Black grouper	None	None
Black sea bass	43% Commercial 57% Recreational (Amendment 13C)	No change proposed
Gag	51% Commercial 49% Recreational (Amendment 16)	No change proposed
Golden tilefish	None	97% Commercial 3% Recreational
Red grouper	None	None
Snowy grouper	95% Commercial 5% Recreational (Amendment 15B)	No change proposed
Speckled hind	None	No change proposed
Vermilion snapper	68% Commercial 32% Recreational (Amendment 16)	No change proposed
Warsaw grouper	None	None

Landings and discards for all sectors for the 9 species in Amendment 17B and red snapper (Amendment 17A).

Landings

Commercial landings (lbs gutted weight) for South Atlantic including Atlantic portion of Monroe County. Source ALS.

Species	2005	2006	2007	Average 05-07
Golden Tilefish	271,554	389,633	296,851	319,346
Snowy Grouper	219,707	213,664	112,390	181,920
Speckled Hind	19,580	3,028	1,625	8,077
Warsaw Grouper	2,650	1,018	515	1,394
Black grouper	156,584	85,434	88,726	110,248
Black sea bass	397,101	474,515	321,620	397,745
Gag	563,620	517,929	604,212	561,920
Red grouper	318,019	254,103	428,831	333,651
Vermilion snapper[2]	1,009,287	764,923	968,253	914,155
Red snapper	118,110	79,351	104,192	100,551

For-Hire landings (lbs gutted weight) for MRFSS and charter combined. Headboat includes Atlantic portion of Monroe County, MRFSS does not include Monroe County.

Species	2005	2006	2007	Average 05-07
Golden Tilefish	214,500	39,340	4,270	86,037
Snowy Grouper	28,198	142,008	23,214	64,473
Speckled Hind	734	6,097	1,398	2,743
Warsaw Grouper	1,346	6,121	17,834	8,434
Black grouper	73,012	30,470	54,611	52,698
Black sea bass	767,963	769,939	700,441	746,114
Gag	511,259	471,606	501,219	494,695
Red grouper	239,926	437,606	548,392	408,641
Vermilion snapper[2]	525,444	624,803	865,547	671,931
Red snapper	289,173	253,718	306,850	283,247

Private Recreational (lbs gutted weight) from MRFSS for South Atlantic. Does not include Monroe County.

Species	2005	2006	2007	Average 05-07
Golden Tilefish	39,671	9,064	4,270	17,668
Snowy Grouper	0	0	1,001	334
Speckled Hind	0	0	0	0
Warsaw Grouper	0	0	12,335	4,112
Black grouper	50,853	16,512	37,414	34,927
Black sea bass	459,898	480,328	453,938	464,721
Gag	313,453	313,890	323,854	317,066
Red grouper	151,406	354,570	415,664	307,214
Vermilion snapper[2]	36,636	88,893	109,948	78,492
Red snapper	125,714	125,156	219,596	156,822

For-Hire + Private Rec (lbs gutted weight). Headboat includes landings from Atlantic portion of Monroe County. MRFSS data do not include Monroe County.

Species	2005	2006	2007	Average 05-07
Golden Tilefish	214,500	39,340	4,270	86,037
Snowy Grouper	28,198	142,008	23,214	64,473
Speckled Hind	734	6,097	1,398	2,743
Warsaw Grouper	1,346	6,121	17,834	8,434
Black grouper	73,012	30,470	54,611	52,698
Black sea bass	767,963	769,939	700,441	746,114
Gag	511,259	471,606	501,219	494,695
Red grouper	239,926	437,606	548,392	408,641
Vermilion snapper[2]	525,444	624,803	865,547	671,931
Red snapper	289,173	253,718	306,850	283,247

Total recreational and commercial landings (lbs gutted weight).

Species	2005	2006	2007	Average 05-07
Golden Tilefish	486,054	428,973	301,121	405,383
Snowy Grouper	247,904	355,672	135,603	246,393

Species	2005	2006	2007	Average 05-07
Speckled Hind	20,314	9,125	3,023	10,821
Warsaw Grouper	3,996	7,139	18,349	9,828
Black grouper	229,596	115,904	143,337	162,946
Black sea bass	1,165,064	1,244,454	1,022,061	1,143,860
Gag	1,074,880	989,535	1,105,431	1,056,615
Red grouper	557,946	691,709	977,222	742,292
Vermilion snapper[2]	1,534,731	1,389,727	1,833,801	1,586,086
Red snapper	407,283	333,070	411,042	383,798

Discards

Expanded number of discarded species by the commercial sector in the South Atlantic.

Species	2005	2006	2007	Average 05-07
Golden Tilefish	0	0	0	0
Snowy Grouper	164	6	185	118
Speckled Hind	1,164	734	259	719
Warsaw Grouper	22	0	7	10
Black grouper	4,168	1,295	1,601	2,355
Black sea bass	12,756	13,709	20,571	15,679
Gag	2,759	472	2,506	1,912
Red grouper	3,595	1,710	5,358	3,554
Vermilion snapper[2]	56,214	44,386	62,024	54,208
Red snapper	5,031	3,451	16,417	8,300

Total number of fish released alive or dead on sampled headboat trips during 2005 - 2007. Average number dead applied by applying SEDAR accepted release mortality rates to average number released alive. Release mortality rates are not known for speckled hind, warsaw grouper, black grouper, and red grouper.

	2005		2006		2007		
Species	Released alive	Released dead	Released alive	Released dead	Released alive	Released dead	Avg dead
Golden Tilefish	0	0	0	0	0	0	0
Snowy Grouper	58	2	11	0	12	3	27
Speckled Hind	12	0	6	0	173	0	unknown
Warsaw Grouper	37	4	8	1	13	0	unknown
Black grouper	559	13	370	5	529	12	unknown
Black sea bass	52,970	2,337	91,423	2,988	133,142	3,256	13,877
Gag	4,130	53	2,397	49	2,283	67	734
Red grouper	4,914	87	2,740	27	2,264	38	unknown
Vermilion snapper[2]	43,501	1,421	53,740	2,352	83,899	3,349	15,095
Red snapper	8,395	95	15,740	198	64,139	1,366	11,770

Total number (A + B1 + B2) of fish caught from MRFSS interviews, estimated total number of fish released (B2), percent released, and estimate total number of dead discards during 2005-2007. Average number dead applied by applying SEDAR accepted release mortality rates to average number released alive. Release mortality rates are not known for speckled hind, warsaw grouper, black grouper, and red grouper.

Species	Est Total	Est Released	% Released	# dead
Golden Tilefish	86,229	1,036	1.20%	1,036
Snowy Grouper	32,138	3,943	12.27%	3,943
Speckled Hind	7,049	5,717	81.10%	unknown
Warsaw Grouper	2,580	126	4.88%	unknown
Black grouper	58,916	48,977	83.13%	unknown
Black sea bass	11,421,618	9,215,151	80.68%	1,382,273
Gag	567,563	446,070	78.59%	111,518
Red grouper	462,151	312,629	67.65%	unknown
Vermilion snapper[2]	1,333,295	536,008	40.20%	134,002
Red snapper	819,257	715,936	87.39%	286,374

Estimated release mortality rates from the SEDAR assessments.

Species	Commercial	Recreational	Assessment
Golden Tilefish	100%	100%	SEDAR 4 (2004)
Snowy Grouper	100%	100%	SEDAR 4 (2004)
Speckled Hind	NA	NA	Unknown
Warsaw Grouper	NA	NA	Unknown
Black grouper	NA	NA	Unknown
Black sea bass	15%	15%	SEDAR Update #1 (2005)
Gag	40%	25%	SEDAR 10 (2007)
Red grouper	NA	NA	Unknown
Vermilion snapper	NA	NA	SEDAR Update #3 (2007)
Red snapper	90%	40%	SEDAR 15 (2008)

South Atlantic Research and Monitoring Priorities 2009

I. Introduction

The 2006 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) directs the Federal Regional Fishery Management Councils to develop a prioritized research plan for submission to the Secretary of Commerce. The following research and monitoring needs were developed by the South Atlantic Council in fulfillment of that requirement.

The goals of the South Atlantic Research and Monitoring Plan are:

1) to improve the quality and quantity of information available for stock assessment and management program development and evaluation; and

2) to encourage a proactive approach to fisheries monitoring and research with priorities based on management needs and intentions.

These goals can be fulfilled by achieving the following objectives:

- Obtain complete fisheries statistics (landings, effort, discards) for all managed resources.
- Obtain adequate landings characterization information (biological sampling of landings & discard, effort details) for priority species.
- Develop representative fishery-dependent abundance measures for priority species.
- Provide reliable and up-to-date species biology and life history information (reproduction, growth, habits, ecosystem role) for all managed resources.
- Obtain adequate economic and social characterization information for all fisheries.
- Obtain fishery and catch data necessary for the Council to monitor and evaluate its management programs.
- Document and quantify habitat usage and availability for all Southeast habitats.
- Develop robust yet documented and validated analytical models appropriate for South Atlantic resources, management requirements, and data availability.

II. SAFMC Prioritized Research Recommendations for 2010-2014

The South Atlantic Council recommends that the first priority is obtaining accurate fishery level information with increased spatial resolution for landings, discards, and effective effort. Research and monitoring programs must be designed to accommodate the multi-species nature of many South Atlantic fisheries.

Efforts should continue to design and implement MRIP to improve information available from the recreational sector which is increasingly a major catch source for many species.

Additional and extensive fishery-independent monitoring will be required in 2010 and beyond to address the potential time-area closures required to end overfishing of red snapper. While the need for greatly expanded fishery-independent monitoring is noted in every existing peer reviewed stock assessment, consideration of closures that will eliminate

fishery-dependent data sources further elevates the need for fishery-independent monitoring.

Additional effort should be devoted to sampling fisheries, such as the pot fishery, dive fishery, and golden tilefish longline fishery, which may potentially continue to operate in areas closed to general hook and line effort. Such sampling should be designed to collect representative biological samples from the landings and should include extensive observer coverage to monitor discards of red snapper.

To address the challenge of multi-species fisheries, the basic sampling unit should be a fishery rather than a species. To address the many managed species of the SAFMC, individual species are separated into two groups: those requiring 'basic' data elements and those requiring 'detailed' data elements. Initial classification into these two groups is based on stocks prioritized on the SEDAR assessment schedule, indicator species identified by the Council, those species included in NOAA Fisheries' Fish Stock Status Indicators listing in the Report to Congress, and recommendations of the SAFMC Science and Statistical Committee.

There are 6 general areas of research and monitoring identified for the South Atlantic, listed here in decreasing order of priority and discussed below in detail:

1) Collect basic fishery data for all managed fisheries.
2) Collect biological and survey information for priority species to support qualitative stock assessments.
3) Collect specific information to support evaluation and refinement of SAFMC management programs and actions.
4) Collect basic social and economic information to support management impact evaluations.
5) Collect general habitat information to support habitat protection efforts
6) Collect ecosystem information to support ecosystem management.

<u>1. Basic fishery data required for managed species</u>

The following information is required for all fisheries listed below:

- Complete catch and bycatch reporting by species
- Per unit (ie, tow, set, site, deployment, depending on the nature of the fishery) information from for-hire and commercial fisheries collected through onboard electronic logbooks linked to GPS
- license id information for all participants and vessels linked to trip and set reports
- Global participant frame provided through licensing of all participants
- Desired location elements include latitude, longitude, and depth

1. Shrimp Trawl Fishery

Per tow: duration, location, trawl details, catch estimate, discard estimate
Per trip: landings by species, trip costs, price paid per lb, # crew
Supplement: 5% observer coverage for discard, 20% coverage for detailed social & economic reporting.

2. Trap Fisheries (e.g., sea bass, golden crab, spiny lobster)
   Per trap/string: duration, location, trap details, catch estimate, discard count
   Per trip: landings by species, trip costs, price paid per lb, # crew
   Supplement: 2% observer coverage for discard, 10 % video discard coverage, 20% coverage for detailed social & economic reporting.

3. Dive or Spear Fisheries
   Per dive: duration, location, gear details, # divers, catch estimate
   Per trip: landings by species, trip costs, price paid per lb, # crew
   Supplements: 20% coverage for detailed social & economic reporting.

4. Handline Fisheries
   Per set/site: duration, location, gear details, catch estimate, discard count
   Per trip: landings by species, trip costs, price paid per lb, # crew
   Supplement: 5% observer coverage for discard, 10% video discard coverage, 20% coverage for detailed social & economic reporting.

5. Deepwater Longline Fishery
   Per set/deployment: duration, location, gear details, catch estimate, discard count
   Per trip: landings by species, trip costs, price paid per lb, # crew
   Supplement: 5% observer coverage for discard, 10% video discard coverage, 20% coverage for detailed social & economic reporting.

6. Pelagic Longline Fishery
   Per set/deployment: soak, location, gear details, catch estimate, discard count
   Per trip: landings by species, trip costs, price paid per lb, # crew
   Supplement: 5% observer coverage for discard, 10% video discard coverage, 20% coverage for detailed social & economic reporting.

7. Bottom Longline
   Per set/deployment: soak, location, gear details, catch estimate, discard count
   Per trip: landings by species, duration, trip costs, price paid per lb, # crew,
   Supplement: 5% observer coverage for discard, 10% video discard coverage, 20% coverage for detailed social & economic reporting.

8. Private Recreational
   Per trip: mode, location, gear details, duration, landings by species, discard by species, expenditures,
   Per Year: # trips by mode, location
   Supplement: Voluntary logbook for discard characteristics (e.g., size and reason for discarding), 20% coverage for detailed social & economic reporting.

9. Headboat Recreational
   Per set/site: location, duration, catch & discard estimate by species
   Per Trip: # anglers, # lines, duration, landings by species
   Supplement: 5% observer coverage for discard characteristics. Voluntary logbook for discard (size), 20% coverage for detailed social & economic reporting of owner/operators. 20% coverage for social & economic evaluations of participants.

10. Party/Charter Recreational Fishery
    Per trip: mode, location, gear details, duration, catch & discard by species
    Supplement: 5% observer coverage for discard characteristics. Voluntary logbook for discard (size), 20% coverage for detailed social & economic reporting of owner/operators. 20% coverage for social & economic evaluations of participants.

2. Collect biological and survey information for priority species to support quantitative stock assessments.

Detailed, species-specific information is required for species that support the bulk of fishery landings to enable high resolution assessment models (i.e., age structured models) that support direct management. This information should be collected for individual species, with sampling effort allocated across time, space, and the fisheries listed above as appropriate to ensure useful and statistically valid data.

For 2010 – 2014, the SAFMC places special emphasis on implementing fishery-independent monitoring programs for the snapper-grouper fishery that will allow evaluation of population status and management performance. This is a critical need at this time because the Council is considering extensive time and area closures to end overfishing of red snapper. These closures will eliminate the primary, fishery-dependent data sources that are now used for all South Atlantic snapper-grouper species stock assessments from a large portion of the fishery and could jeopardize future feasibility to adequately assess many species in the complex.

SAFMC Primary Data Collection Species:

vermilion snapper	yellowtail snapper
red snapper	gray triggerfish
snowy grouper	mutton snapper
tilefish	red porgy
red grouper	wreckfish
black grouper	king mackerel
scamp	Spanish mackerel
black sea bass	dolphin
gag grouper	spiny lobster
greater amberjack	golden crab
white grunt	spiny lobster

Additional Data Elements for Primary Species:

- Representative sampling by season, fishery, and area of length, age, sex, and weight for landed & discarded fish.
- Fishery-dependent CPUE, derived from increased effort resolution collected through the basic elements (1)
- Survey-based fishery-independent CPUE
- Life history research: rates of growth, mortality, maturity, fecundity
- Movement, migration, and stock structure evaluations

SAFMC Secondary Data Collection Species

blueline tilefish	Goliath grouper
cobia	little tunny
speckled hind	wahoo
Warsaw grouper	hogfish
yellowedge grouper	shrimp

Additional Data Elements for Secondary species:

- Fishery-dependent CPUE, based on increased effort resolution collected through the basic elements (1)
- Survey-based fishery-independent CPUE
- Life history details: rates of growth, mortality, maturity, fecundity
- Movements, migration, and stock structure evaluations

3. Collect specific information to support evaluation and refinement of SAFMC management programs and actions.

The Council has implemented some management actions that cannot be adequately evaluated with the information in the previous sections alone. This section also includes recommendations that affect collection and dissemination of the information desired above.

1. Full implementation of ACCSP in the South Atlantic.
2. Resolve confidentiality issues that prohibit reporting of, and access to, basic catch statistics by species, state, and year.
3. Eliminate duplicative programs such as paper logbooks which duplicate information provided in state trip ticket programs.
4. Restructure the FSSI stocks for the South Atlantic Council to include only those stocks listed in Section VI-2 above as target species.
5. Provide annual SAFE reports and 'Trends' reports for each FMP summarizing the data elements contained in Sections III.1 and III.2.
6. Resolve ongoing issues with recreational data collection; ensure that recreational statistics can be reported according to Council boundaries.
7. Reduce data dissemination delays by continuing to develop and implement automated and web-based data entry programs that can accommodate the set level information described above.
8. Monitor fish population abundance inside protected areas (Oculina Closed Area, MPAs)
9. Determine stock status for severely restricted species (Warsaw grouper, speckled hind and Goliath grouper) to enable the Council to evaluate its management program.
10. Develop education programs for all participants that stress the importance of accurate and timely reporting of fisheries data and improve species id for self-reported data.
11. Collect information on enforcement activities and develop statistics to enable the Council to objectively evaluate enforcement.

4. Improve Social and Economic Evaluations

Fishery and species specific monitoring information necessary for social and economic information is addressed in the previous sections. Recommendations that cross multiple fisheries or that represent research needs are listed here.

1. Determine recreational value.
2. Develop improved bio-economic models.
3. Develop models to test between different management scenarios
4. Develop methods to integrate socio-economic information with the management process
5. Evaluate the impacts of imported fisheries products.

5. Improve Habitat Evaluation and Documentation

Extensive habitat research and monitoring recommendations are detailed in various Council FMPs. The items listed here cross multiple FMPs and help support the Council's place-based management approaches for South Atlantic fisheries. These are research needs that should only need occasional updating once initially addressed.

1. Develop maps of and quantify available habitat and seasonal usage by target species.
2. Develop maps describing habitat types in proposed HAPCs.
3. Develop maps describing available habitat in proposed MPAs.

6. Improve Ecosystem-level information

The Council's Fishery Ecosystem Plan (FEP) will address many ecosystem level research and monitoring needs in detail. The primary short-term need is to implement robust monitoring programs to start building the long-term time series of information that is needed to evaluate ecosystem-level issues. These are both monitoring needs that need to be conducted annually.

1. Initiate a comprehensive survey of South Atlantic living marine resources
2. Develop long-term monitoring of diet, productivity, and species interactions as required for ecosystem-level modeling

III. Long Term Research Needs

The items listed above address the most critical needs in the South Atlantic and are considered to represent the minimum information required for adequate management. There are other needs that are less pressing and are therefore considered long-term. The same list of general issues is repeated for consistency.

1. Basic data elements: long term improvements

1. Evaluate the convenience, quality, and utility of set-level logbook reporting and supplemental data collection programs; refine data elements, sampling intensity, collection programs, and methods as needed.

2. Develop a process to enable changes to historic data sources that will enable resolution of errors, address misidentification of species, and allow elimination of ‘unclassified’ categories.

2. Improving Detailed Information for Primary Species

1. Evaluate data collected by fishery and from comprehensive surveys to ensure the appropriate species receive intensified sampling.
2. Develop a long-term plan for regularly evaluating life history characteristics of target species.
3. Develop robust QA/QC programs for age determination.
4. Evaluate sampling intensity and modify sampling targets as necessary.

3. Improving Evaluation of Specific Management Actions

1. Develop a long-term plan for regularly evaluating life history characteristics for all species included in Council FMPs.
2. Support monitoring and research programs necessary to develop and evaluate limited access programs.
3. Develop a long-term plan for regularly evaluating trends and indicators of stock status for secondary species and all other managed species to enable management to adapt to fisheries changes as necessary.

Appendix G. Summary of monitoring methods

The intent of this summary is to provide the reader with more detailed technical information on various methods of fisheries monitoring. Depending on whether the fishery is being monitored for bycatch, overall characterization or compliance with regulations, these methods will vary in their appropriateness and effectiveness. Some of these methods may be appropriate ways to monitor the golden crab fishery in the South Atlantic.

Onboard Observers

Onboard observers are used in several U.S. fisheries to collect biological data. Usually only a portion of the trips conducted by the fleet are required to have observers on them. Some international fisheries have required 100% observer coverage and in some cases, the observers have also been responsible for reporting violations of regulations. Onboard observers are typically the most expensive means of collecting biological data. In the U.S. at-sea observers have usually been paid for through NMFS or fishermen or through a cost-sharing arrangement.

South Atlantic Snapper Grouper Pilot Program (4/06-5/07 and ongoing)

In 2006, the Gulf and South Atlantic Fisheries Foundation conducted a pilot study to characterize the catch and fate of discards in the snapper grouper vertical hook-and-line fishery of the South Atlantic. The major goals of this program were to gather catch, effort, and disposition data. Beginning in late 2006, two fishery observers were trained and began onboard observation. So far, this research has placed observers on board over 19 different commercial fishing vessels and accumulated over 130 observed sea days. Although formal data analysis has not begun, preliminary analysis shows an average of 7 days per trip and 55 sets per trip. However, there was considerable variance depending upon the size of the vessel with a range of trip length from 2 to 11 days and number of sets from 14 to 113. Analysis of catch and discard fate began in the Fall of 2007 and a presentation was made to the South Atlantic Fishery Management Council at their June 2008 meeting. The intent of this project was not to form a stand-alone dataset, but to augment currently available datasets (Jepson, 2007). Catch characterization trips were completed in all four South Atlantic states with eight (8) trips in NC, ten (10) in SC, six (6) in GA and four (4) in FL. Trip lengths ranged from 2 to 13 days with an average of 7 days per trip overall. The number of sets per trip ranged from 14 to 142 with an overall average of 61 sets per trip. Trip length varied with vessels from North Carolina making shorter day trips averaging 4 days in length, while vessels in the three other South Atlantic states averaging longer trips closer to the overall average of 7 days. A final report for this project is currently under development.

Electronic Monitoring (EM)

Electronic (video) monitoring has been used in the British Columbia Limited Access Program fisheries, some Alaskan fisheries (crab), the Pacific whiting fishery, among others. Pilot programs to determine the feasibility of using EM in general and the

feasibility of using EM as a replacement for at-sea observers have been conducted in various places and reports on these pilot programs are summarized below.

In general, EM has been used or tested in trawl, longline, and hook-and-line fisheries. Video monitoring is sometimes used in place of at-sea observers, to supplement at-sea observers, and/or as a means to audit electronic logbook data. Use varies depending on the objectives of the fishery with regards to discarding and individual catch tracking. Pilot programs have shown video monitoring systems (this includes data review) to be less expensive than at-sea observers and to be capable of identifying discard occurrences and species-specific identification.

1) In "Discussion Paper on Issues Associated with Large Scale Implementation of Video Monitoring," Kinsolving (2006) assesses what current EM technology can and cannot do well for the Alaska rockfish trawl fishery. He writes,

Video, either alone or in conjunction with other data gathering equipment (electronic monitoring, or EM), is becoming an increasingly viable technology for monitoring some types of fishing activity or enhancing the ability of observers to gather fisheries data. The technologies associated with EM are in a state of rapid development. The combination of increasingly effective data compression algorithms, increased computer processing power, and the rapidly decreasing cost of data storage have reached a point where, on a technology level, electronic monitoring is ready for large scale implementation for some fisheries monitoring applications. However, while many of the technical issues associated with the collection of EM data have been addressed, neither NMFS nor the fishing industry have fully addressed many of the infrastructural and cost related issues associated with larger scale EM program implementation.

Based on studies conducted to date, it appears that EM technology is able to:

- *Function sufficiently reliably in the marine environment.*
- *Identify fishing events (e.g. net deployment, line retrieval) and the location where those events took place.*
- *Determine when and if discard events take place on trawl catcher vessels.*
- *Verify compliance with seabird avoidance measures on longliners.*
- *Assist an observer in monitoring activities in otherwise unobservable areas of catcher/processors.*

On the other hand, EM systems are only moderately able to:

- *Quantify the amount of discards on trawl vessels.*
- *Detect and identify seabird bycatch to species on longliners.*
- *Estimate the species composition and number of fish in longline catch.*

The at-sea portion of the technology, while the focus of most research to date, is only one component of an effective EM system. For an EM system to function properly, the data collected at-sea must undergo some degree of methodical review. In the studies conducted to date, this review has been fairly meticulous, with the assumption being that most missed events have been due to technology and data collection issues rather than

data review issues. While such an approach is necessary when testing the applicability of a given technology, it does serve to possibly over-inflate the total cost of an effective EM program.

The document by Kinsolving (2006) includes an overview of the 2005 Kodiak electronic monitoring project where two video monitoring systems are compared. Cost projections were based on the assumption of 18 boats, where each boat fishes an average of 7 trips, and trip length will average 3 days, of which there is 24 hours of activity to review. Total minimum and maximum costs are laid out in the document. Total equipment costs (including installation and maintenance) per vessel ranged from $5,875 to $13,325 per year. The cost of maintenance and storage was estimated at $100 per trip. Although data review costs could vary enormously depending on how much data are reviewed, the document assumes that a full review would cost approximately $50,000 per year for all vessels together (see table below).

2) McElderry et al. (2003) conducted a large scale deployment of electronic monitoring systems on the 2002 BC halibut longline fishery to evaluate the feasibility of EM as an alternative to observer-based at-sea monitoring. Two cameras per vessel were used for this project. In some cases, at-sea observers were deployed on the same vessels as the EM system. In these cases, comparisons could be made between observer and reviewed EM video to determine accuracy of recorded information. The authors note that overall, EM and observer catch estimates agreed within 2% and individual identifications by hook agreed in over 90% of the catch records. They also note that there was close agreement between EM and observers regarding whether a fish was kept or discarded and the time, location, and depth at the set start and finish. The authors concluded that EM is a promising tool for at-sea monitoring applications depending on specific fishery management objectives regarding monitoring. They also note it would have a substantially lower cost than at-sea observers. They suggest two ways to use EM for the BC longline fishery: 1) an integrated EM-observer program using both methods in a complimentary fashion to achieve fleet sampling objectives; and 2) using EM and an electronic fishing log as an at-sea monitoring audit tool. While at-sea observers cost CA$320 per vessel per day for fishermen and CA$130 per day for the federal government, EM cost about CA$210 per vessel per day (see table below).

Comment [m1]: What does this stand for?

3) McElderry et al. (2004) assessed the feasibility of electronic monitoring for the Cape Cod longline haddock fishery where bycatch rates of cod must be closely monitored. The primary objectives of the project were to evaluate the effectiveness of electronic monitoring in estimating the at-sea catch of haddock and cod, assess the suitability of EM systems for various components of the fleet, obtain skipper and crew feedback on EM suitability, and foster fleet education on EM monitoring as well as verify EM derived catch information by comparison with like data from observers. Two cameras per vessel were used for this pilot program. Costs were estimated at $1,200 per vessel per day for the pilot project (see table below). A full EM program cost per vessel is suspected to be much less. In general, McElderry (2003) estimated that EM programs run between 20-60% of the cost of an at-sea observer program.

McElderry et al. (2004) provide information on an EM program for the British Columbia groundfish longline fishery that involves less than full data review requirements. They write:

One possible fleet monitoring design might involve large-scale deployment of EM systems on the fleet with image data selectively analyzed according to a specific sample design. In this way, the analysis effort changes from full interpretation of all imagery from a fishing trip to sampling the fleet, monitoring imagery for sets or portions of sets. British Columbia's groundfish longline fishery is adopting this approach to provide full catch accountability in their 17,000-seaday fishery. Fishing vessels will carry EM systems on a fishing trip and fishers will keep a careful record of catch in an electronic fishing log (included as part of the EM system). The logbook data will be audited with catch data from EM imagery and the level of agreement will prescribe the amount of image viewing required. This unique monitoring approach provides cost effective monitoring, more actively engages industry in data collection, and, when analysis cost is applied individually, provides a positive stimulus for accurate catch accounting by industry.

Table Summarizing Pilot Program Evaluation of the Use of Electronic Monitoring (EM) for Various Fisheries.

Type of fishery	Discard concerns?	Equipment costs	Data review costs
Alaska Rockfish Trawl	Yes	$5,900-$13,300 per vessel annually	$50,000 for all vessels per year
Cape Cod Longline for Haddock	Yes, cod	(two cameras) $1,200 per vessel per day for pilot project, developed EM program would be less costly	Not specified, paid for by federal government
BC Halibut Longline Fishery (LAP fishery)	Yes, various rockfish species	(two cameras) CA$210 per vessel per day	Not specified, paid for by federal government

References

Kinsolving, Alan. 2006. "Discussion Paper on Issues Associated with Large Scale Implementation of Video Monitoring". National Marine Fisheries Service.

McElderry, H. 2003. Sustainable Fisheries Management Using Electronic Fisheries Monitoring. Seafood NZ. 11(6).

McElderry, H. J. Schrader, and J. Illingworth. 2003. The Efficacy of Video-Based Electronic Monitoring for the Halibut Longline Fishery. Fisheries and Oceans Canada Research Document 2003/042.

McElderry, H., J. Illingworth, D. McCullough, and J. Schrader. 2004. Electronic Monitoring of the Cape Cod Haddock Fishery in the United States – A Pilot Study. Unpublished report prepared for Cape Cod Commercial Hook Fishermen's Association (CCCHFA) by Archipelago Marine Research Ltd., Victoria, BC Canada.

Electronic Logbooks

Electronic logbooks improve the accuracy of data collection at the species level by allowing fishermen to report catch data at sea throughout a fishing day rather than reporting pounds of fish as determined by the dealer. The electronic logbooks also enable the collection of more accurate bycatch information by allowing the reporting of bycatch while at sea at the time of the actual discard. Additionally, electronic logbooks also offer practical business benefits for the user (fishermen) in that all data that are recorded are available for the fishermen; they can see their data overlaid on nautical charts by species, by area, and by time period. Fishermen also have the ability to see their own catch per unit effort statistics for different time periods.

South Atlantic Electronic Logbook Pilot Project

Electronic logbooks have been used in several fisheries in the U.S. including fisheries in New England. As required by Amendment 4 to Snapper Grouper Fishery Management Plan, commercial fishermen fishing for South Atlantic snapper grouper have been required to fill out a paper logbook since 1992. In 2002, the SAFMC and Technology Planning and Management Corporation (TPMC) (now Perot Systems Government Services [PSGS]) tested the use of electronic logbook reporting using the Thistle Marine™ electronic logbook. This device is "ruggedized" for small boat fisheries and is designed specifically for fisheries logbook recording and biological sampling during fishing operations. The project examined the proposition that an electronic logbook can collect all of the data elements presently required by the paper logbook program and can collect more accurate and comprehensive bycatch and catch location information.

The Thistle Marine HMS-110, (Thistle box), is an off-the-shelf device that is ideally suited to electronic data collection on small, open wheelhouse vessels such as those in the snapper/grouper fishery. The device is totally self-contained, weatherproof, and can be operated with a gloved hand. Power is supplied through a cable that is plugged into the back of the device and connected to the boat's 12-volt power supply. The same cable also interfaces the Thistle box with the vessel's GPS unit using a standard NMEA (National Marine Electronics Association) connection. After a fishing trip, the fisherman brings the unit home, connects it to the phone line, and sends and saves the data on Thistle Marine's secure website. The unit's ease of installation and durability make it ideal for small fishing vessels where 110-volt power is not available for a PC or an open wheelhouse precludes having a computer onboard.

The 2002 project was implemented on two commercial snapper/grouper vessels in South Carolina and North Carolina from May, 2002 through November, 2002. The electronic logbook pilot program recorded:

- Number of fish caught (although pounds can be recorded instead, number of fish was more expeditious in this case)
- Number of fish discarded
- Number of crew
- Number of lines
- Number of hooks per line
- Date (when interfaced with vessel's GPS)
- Time (when interfaced with vessel's GPS)
- Location (when interfaced with vessel's GPS)

The second major goal of this project was to examine the feasibility of using an electronic logbook to record biological

information on the catch that is retained and on the component that is discard. A final presentation was given to the Council and Snapper Grouper Advisory Panel at their December 2002 meeting and the results were well received by the fishermen involved, members of the Snapper Grouper Advisory Panel, and by Council members[1].

By far, the greatest challenge to implementing an electronic logbook on a commercial fishing vessel is integrating the data collection flow into the vessel's

[1] The pilot project collected over four thousand data points representing nineteen commercial snapper grouper trips aboard two bandit vessels. Thirteen hundred catch observations were recorded representing just over five hundred anchor sets. Both landed catch and discards were recorded in numbers of fish for twenty-nine different species. In addition, the electronic logbook recorded nearly twice as many species landed per trip than the paper logs. The reason for this is most likely a result of recall error when filling out paper logs and the seafood dealer's practice of combining smaller quantities of fish of different species and reporting them as one.

fishing operations. Almost all of the time spent on this pilot project and most of the programming changes made to the Thistle box were to fit data collection into the workflow of the fishermen during fishing operations.

When interfaced with the vessel's GPS, the Thistle box can be viewed as an "event" recorder. Each event that is entered is stamped with the date, time, and location from the GPS receiver. In the lobster fishery where the system was first conceived, an event is each time a trap is hauled or a string of traps is hauled. For the snapper/grouper fishery pilot project, TPMC identified the events associated with the way bandit fishermen fish their gear. When the fisherman identifies where they want to fish, they drop anchor and remain in that location until they are done fishing and prepare to move on to another location.

After dropping anchor, the fisherman will record the event on the Thistle box, noting the date, time, and location of the event. When fishing is complete, the fisherman will note that event by recording the pounds of fish kept by species and the number of fish discarded by species. The date, time, and location would again be recorded to complete the overall fishing record for this site. A trip would be composed of a number of these two events at each fishing site.

drop anchor → **fish** → **haul anchor** → **record data**

This pilot program was funded again in 2004 and 2005 and applied to a larger number of vessels. Details regarding the best software and hardware to use for the snapper grouper fleet are still being determined. Thus far, several options have been tested[2].

Comment [m2]: See above. Need update.

It should be noted that all participants found the charting capabilities of the P-Sea WindPlot software to be an excellent addition to their standard electronic navigation

[2] Boatracs and Skymate VMS units were used for electronic submission. Shoreside testing revealed that the Skymate unit had a transmission success rate of only 50% while the Boatracs unit had a 100% success rate. The cost for a Skymate unit is $1599 plus installation and activation costs compared to $3195 plus installation costs for the Boatracs unit.

Several laptop and tablet PCs were tested, but the best option for the money seemed to be Dell laptops (Dell Inspiron 2600, Latitude D505 and C640). Although susceptible to glare problems, there were no failures of these units during two year deployments in open and closed wheelhouses.

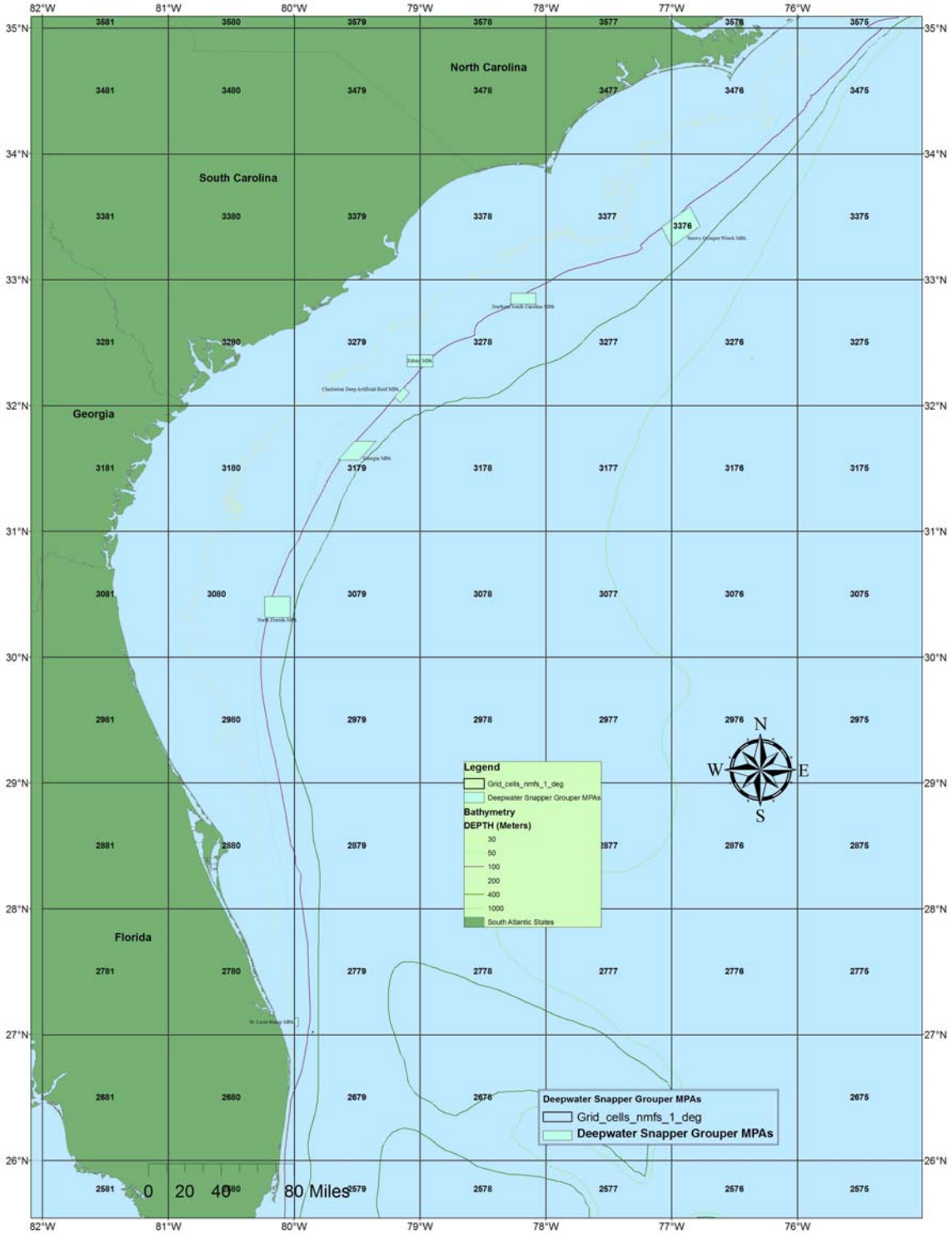
Of the e-logbook software considered (Thistle, Windplot, UNH) the UNH was used on a greater proportion of vessels as the Windplot software could not track simultaneous effort in fixed gear fisheries. The UNH software could capture simultaneous effort, but could not dissociate effort from trips (setting a trap on one trip and retrieving on another trip). This was dealt with by allowing manual entry of set times and haul durations. The Thistle software could not handle multiple species records for a haul, as it was developed for lobster fishing and only accommodated one species record.

Data were transmitted off the vessel and to an email address by VMS, and loaded to Oracle tables using a PLSQL script.

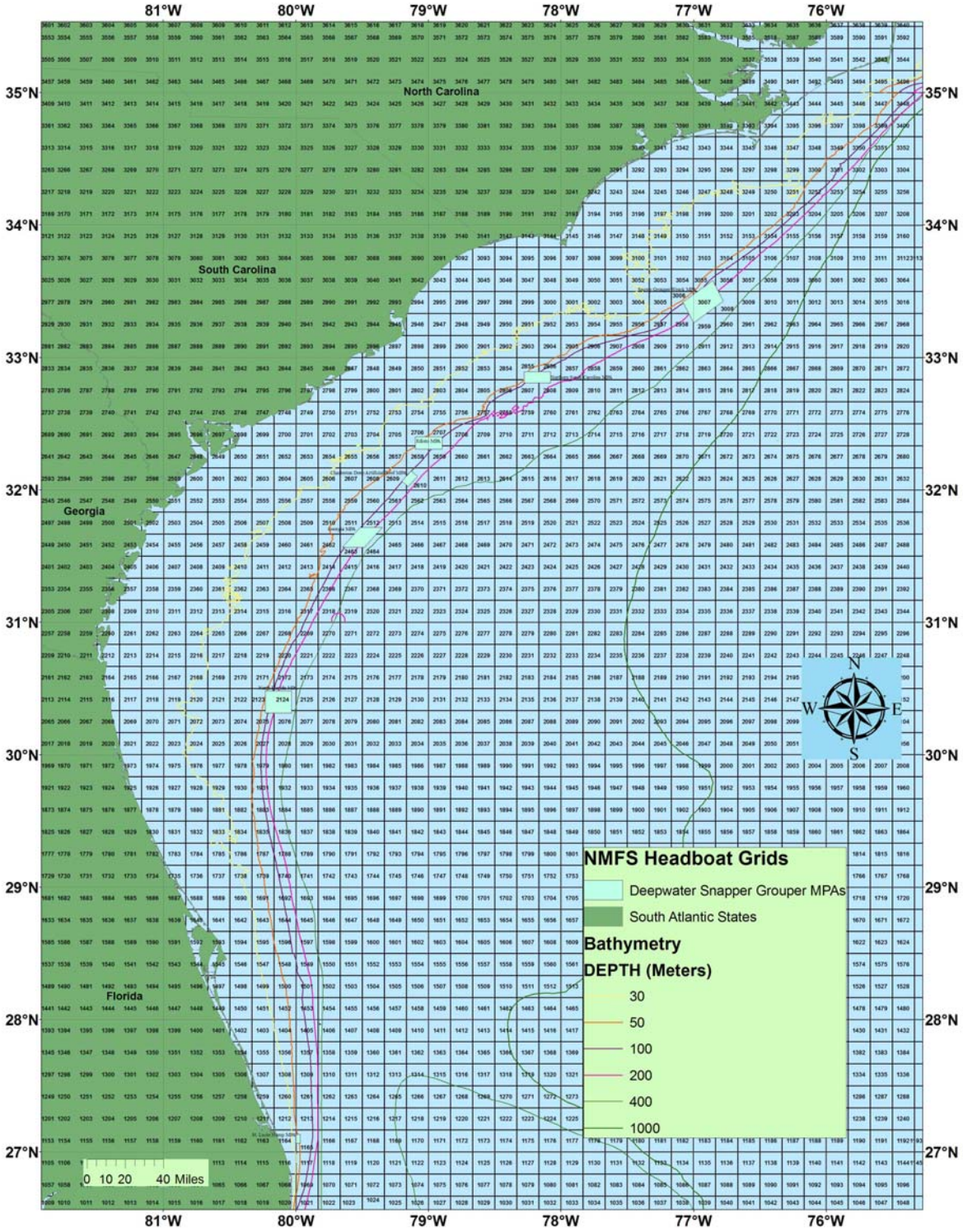
equipment. However, the use of these computer systems has not been without a few minor issues, considering the corrosive environment in which they have been deployed.

Although not yet developed for the electronic logbook pilot programs in the South Atlantic, it has been suggested that electronic logbook data could be submitted via a VMS satellite transmission. This would enable real-time data collection.

Appendix H. Logbook and Headboat Reporting Grids, including Marine Protected Area designations.



Prepared by Roger Pugliese SAFMC 9/17/08



Prepared by Roger Pugliese SAFMC 9/17/08

Federal Register

Friday,
January 16, 2009

Part III

Department of Commerce

National Oceanic and Atmospheric Administration

50 CFR Part 600

Magnuson-Stevens Act Provisions; Annual Catch Limits; National Standard Guidelines; Final Rule

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 600

[Docket No. 070717348–81398–03]

RIN 0648–AV60

Magnuson-Stevens Act Provisions; Annual Catch Limits; National Standard Guidelines

AGENCY: National Marine Fisheries Service (NMFS); National Oceanic and Atmospheric Administration (NOAA); Commerce.

ACTION: Final rule.

SUMMARY: This final action amends the guidelines for National Standard 1 (NS1) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). This action is necessary to provide guidance on how to comply with new annual catch limit (ACL) and accountability measure (AM) requirements for ending overfishing of fisheries managed by Federal fishery management plans (FMPs). It also clarifies the relationship between ACLs, acceptable biological catch (ABC), maximum sustainable yield (MSY), optimum yield (OY), and other applicable reference points. This action is necessary to facilitate compliance with requirements of the Magnuson-Stevens Act to end and prevent overfishing, rebuild overfished stocks and achieve OY.

DATES: Effective February 17, 2009.

ADDRESSES: Copies of the Regulatory Impact Review (RIR)/Regulatory Flexibility Act Analysis (RFAA) can be obtained from Mark R. Millikin, National Marine Fisheries Service, 1315-East-West Highway, Room 13357, Silver Spring, Maryland 20910. The RIR/RFAA document is also available via the internet at *http://www.nmfs.noaa.gov/msa2007/catchlimits.htm*. Public comments that were received can be viewed at the Federal e-Rulemaking portal: *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Mark R. Millikin by phone at 301–713–2341, by FAX at 301–713–1193, or by *e-mail: Mark.Millikin@noaa.gov.*

SUPPLEMENTARY INFORMATION:

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I. Overview of Revisions to the NS1 Guidelines

The MSA serves as the chief authority for fisheries management in the U.S. Exclusive Economic Zone (EEZ). The Act provides for ten national standards (NS) for fishery conservation and management, and requires that the Secretary establish advisory guidelines based on the NS to assist in the development of fishery management plans. Guidelines for the NS are codified in subpart D of 50 CFR part 600. NS1 requires that conservation and management measures ''shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.''

The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA) amended the MSA to include new requirements for annual catch limits (ACLs) and accountability measures (AMs) and other provisions regarding preventing and ending overfishing and rebuilding fisheries. To incorporate these new requirements into current NS1 guidance, NMFS initiated a revision of the NS1 guidelines in 50 CFR 600.310. NMFS published a notice of intent (NOI) to prepare an environmental impact statement (EIS) and commenced a scoping period for this action on February 14, 2007 (72 FR 7016), and proposed NS1 guidelines revisions on June 9, 2008 (73 FR 32526). Further background is provided in the above-referenced **Federal Register** documents and is not repeated here. The proposed guidelines provided a description of the reasons that overfishing is still occurring and the categories of reasons for overfishing likely to be addressed by new MSA requirements combined with the NS1 guidelines. The September 30, 2008 NMFS Quarterly Report on the Status of U.S. Fisheries indicates that 41 stocks managed under Federal FMPs are undergoing overfishing.

NMFS solicited public comment on the proposed NS1 guidelines revisions through September 22, 2008, and during that time, held three public meetings, on July 10, 2008 (Silver Spring, Maryland), July 14, 2008 (Tampa, Florida), and July 24, 2008 (Seattle, Washington), and made presentations on the proposed revisions to each of the eight Regional Fishery Management Councils (Councils). NMFS received over 158,000 comments on all aspects of the proposed NS1 guidelines revisions. Many of the comment letters were form letters or variations on a form letter. In general, the environmental community supported the provisions in the proposed action but commented that they needed to be strengthened in the final action. Alternatively, comments from the fishing industry and some of the Councils said the proposed revisions were confusing, too proscriptive or strict, and lacked sufficient flexibility.

II. Major Components of the Proposed Action

Some of the major items covered in the proposed NS1 guidelines were: (1) A description of the relationship between MSY, OY, overfishing limits (OFL), ABC, ACLs, and annual catch targets (ACT); (2) guidance on how to combine the use of ACLs and AMs for a stock to prevent overfishing when possible, and adjust ACLs and AMs, if an ACL is exceeded; (3) statutory exceptions to requirements for ACLs and AMs and flexibility in application of NS1 guidelines; (4) ''stocks in the fishery'' and ''ecosystem component species'' classifications; (5) replacement of MSY control rules with ABC control rules and replacement of OY control rules with ACT control rules; (6) new requirements for scientific and statistical committees (SSC); (7) explanation of the timeline to prepare new rebuilding plans; (8) revised guidance on how to establish rebuilding time targets; (9) advice on action to take at the end of a rebuilding period if a stock is not yet rebuilt; and (10) exceptions to the requirements to prevent overfishing.

III. Major Changes Made in the Final Action

The main substantive change in the final action pertains to ACTs. NMFS proposed ACT as a required reference point that needed to be included in FMPs. The final action retains the concept of an ACT and an ACT control rule, but does not require them to be included in FMPs. After taking public comment into consideration, NMFS has decided that ACTs are better addressed as AMs. The final guidelines provide that: ''For fisheries without inseason management control to prevent the ACL from being exceeded, AMs should utilize ACTs that are set below ACLs so that catches do not exceed the ACL.''

In response to public comment, this final action also clarifies text on ecosystem component species, OFL, OY specification, ABC control rule and specification, SSC recommendations, the setting of ACLs, sector-ACLs, and AMs, and makes minor clarifications to other text. Apart from these clarifications, the final action retains the same approaches described in the proposed guidelines with regard to: (1) Guidance on how to combine the use of ACLs and AMs for a stock to prevent overfishing when possible, and adjust ACLs and AMs, if an ACL is exceeded; (2) statutory exceptions to requirements for ACLs and AMs and flexibility in application of NS1 guidelines; (3) ''stocks in the fishery'' and ''ecosystem component species'' classifications; (4) new requirements for SSCs; (5) the timeline to prepare new rebuilding plans; (6) rebuilding time targets; (7) advice on action to take at the end of a rebuilding period if a stock is not yet rebuilt; and (8) exceptions to the requirements to prevent overfishing. Further explanation of why changes were or were not made is provided in the ''Response to Comments'' section below. Detail on changes made in the codified text is provided in the ''Changes from Proposed Action'' section.

IV. Overview of the Major Aspects of the Final Action

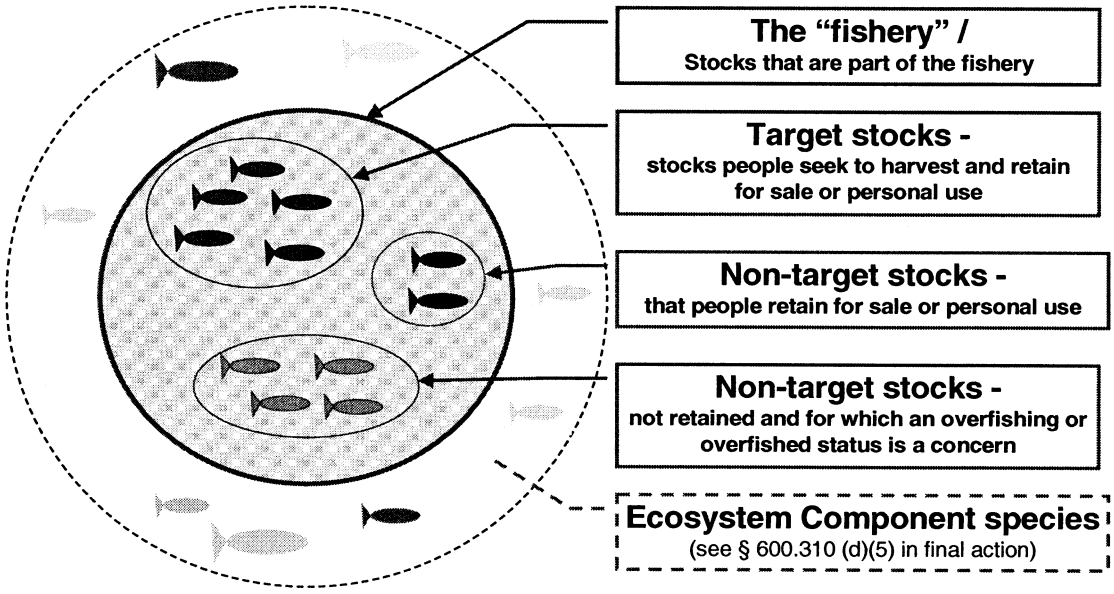
A. Stocks in the Fishery and Ecosystem Component Species

The proposed NS1 guidelines included suggested classifications of ''stocks in the fishery'' and ''ecosystem component (EC) species.'' *See* Figure 1 for diagram of classifications. Public comments reflected confusion about this proposal, so NMFS has clarified its general intent with regard to these classifications. More detailed responses to comments on this issue are provided later in this document.

The classifications in the NS1 guidelines are intended to reflect how FMPs have described ''fisheries,'' and to provide a helpful framework for thinking about how FMPs have incorporated and may continue to incorporate ecosystem considerations. To that end, the proposed NS1 guidelines attempted to describe the fact that FMPs typically include certain target species, and sometimes certain non-target species, that the Councils and/or the Secretary believed required conservation and management. In some FMPs, Councils have taken a broader approach and included hundreds of species, many of which may or may not require conservation and management but could be relevant in trying to further ecosystem management in the fishery.

NMFS wants to encourage ecosystem approaches to management, thus it proposed the EC species as a possible classification a Council or the Secretary could—but is not required to—consider. The final NS1 guidelines do not require a Council or the Secretary to include all target and non-target species as ''stocks in the fishery,'' do not mandate use of the EC species category, and do not require inclusion of particular species in an FMP. The decision of whether conservation and management is needed for a fishery and how that fishery should be defined remains within the authority and discretion of the relevant Council or the Secretary, as appropriate. NMFS presumes that stocks or stock complexes currently listed in an FMP are ''stocks in the fishery,'' unless the FMP is amended to explicitly indicate that the EC species category is being used. ''Stocks in the fishery'' need status determination criteria, other reference points, ACL mechanisms and AMs; EC species would not need them. NMFS recognizes the confusion caused by wording in the proposed action and has revised the final action to be more clear on these points.

Figure 1. General Framework for "Stocks in the Fishery" versus "Ecosystem Component Species." This figure describes the kind of stocks or stock complexes that might fall into the two classifications, but should not be viewed as requiring FMPs to include specific stocks or stock complexes in either category.

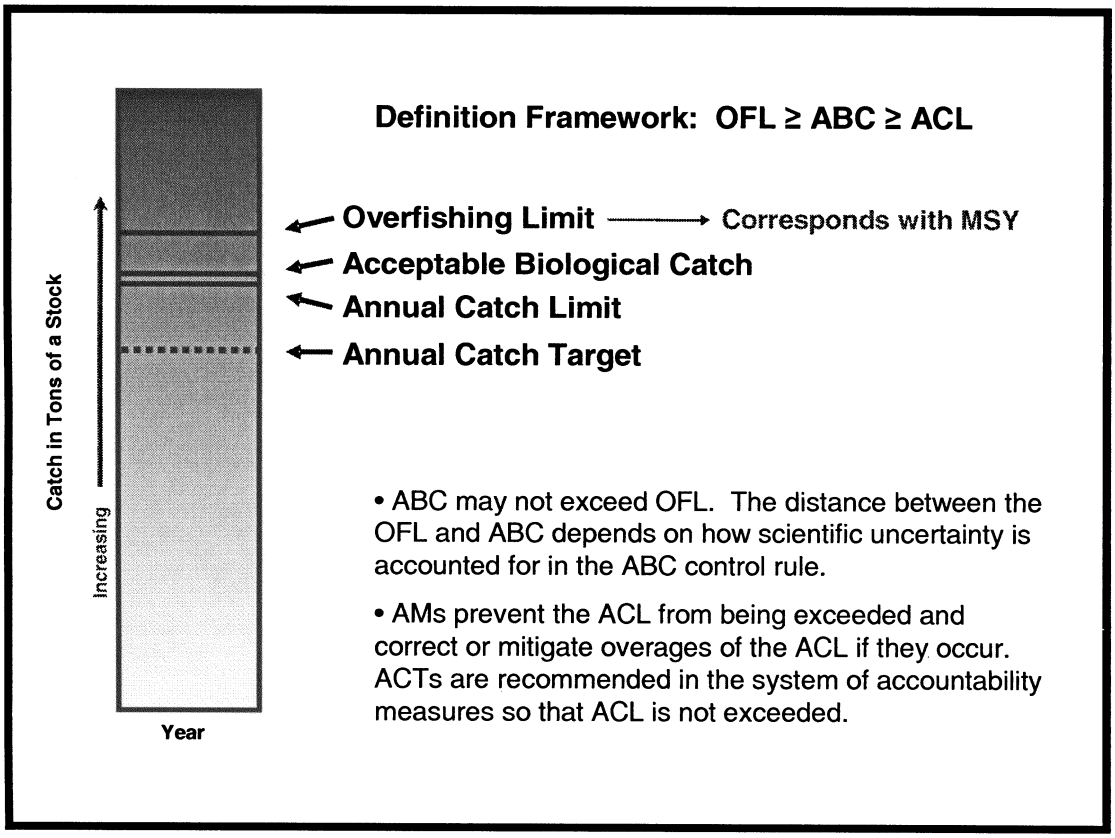


B. Definition Framework for OFL, ABC, and ACL

The MSRA does not define ACLs, AMs, and ABC, so NMFS proposed definitions for these terms in the proposed action. NMFS also proposed definitions for the terms OFL and ACT because it felt that they would be useful tools in helping ensure that ACLs are not exceeded and overfishing does not occur. The proposed NS1 guidelines described the relationship between the terms as: OFL ≥ ABC ≥ ACL ≥ ACT. In response to public comment, the final action revises the definition framework as: OFL ≥ ABC ≥ ACL. As described above, NMFS has retained ACT and the ACT control rule in the NS1 guidelines, but believes that they are more appropriate as AMs. NMFS believes ACTs could prove useful as management tools in fisheries with poor management control over catch (i.e., that frequently exceed catch targets).

NMFS received many comments on the definition framework, and some commenters stated that it should be revised as: OFL > ABC > ACL. Having considered public comment and reconsidered this issue, NMFS has decided to keep the framework as: OFL ≥ ABC ≥ ACL. However, NMFS believes there are few fisheries where setting OFL, ABC, and ACL all equal to each other would be appropriate. While the final action allows ABC to equal OFL, NMFS expects that in most cases ABC will be reduced from OFL to reduce the probability that overfishing might occur in a year. NMFS has added a provision to the final NS1 guidelines stating that, if a Council recommends an ACL which equals ABC, and the ABC is equal to OFL, the Secretary may presume that the proposal would not prevent overfishing, in the absence of sufficient analysis and justification for the approach. See figure 2 for an illustration of the relationship between OFL, ABC, ACL and ACT. Further detail on the definition framework and associated issues is provided in the ''Response to Comments'' section below.

Figure 2: Relationship between OFL, ABC, ACL and ACT



C. Accountability Measures (AMs)

Another major aspect of the revised NS1 guidelines is the inclusion of guidance on AMs. AMs are management controls to prevent ACLs, including sector-ACLs, from being exceeded, and to correct or mitigate overages of the ACL if they occur. NMFS has identified two categories of AMs, inseason AMs and AMs for when the ACL is exceeded. As described above, ACTs are recommended in the system of AMs so that ACLs are not exceeded. As a performance standard, if catch exceeds the ACL for a given stock or stock complex more than once in the last four years, the system of ACLs and AMs should be re-evaluated, and modified if necessary, to improve its performance and effectiveness.

D. SSC Recommendations and Process

Section 302(h)(6) of the MSA provides that each Council is required to ''develop annual catch limits for each of its managed fisheries that may not exceed the fishing level recommendations of its scientific and statistical committee or the peer review process established under subsection (g).'' MSA did not define ''fishing level recommendations,'' but in section 302(g)(1)(B), stated that an SSC shall provide ''recommendations for acceptable biological catch, preventing overfishing, maximum sustainable yield, and achieving rebuilding targets,'' and other scientific advice.

NMFS received a variety of public comments regarding interpretation of ''fishing level recommendations.'' Some commenters felt that the SSC's ''fishing level recommendations'' that should constrain ACLs is the overfishing limit (OFL); other commenters stated that ''fishing level recommendations'' should be equated with MSY. NMFS does not believe that MSA requires ''fishing level recommendations'' to be equated to the OFL or MSY. As described above, the MSA specifies a number of things that SSCs recommend to their Councils. Of all of these things, ABC is the most directly relevant to ACL, as both ABC and ACL are levels of annual catch.

The preamble to the proposed NS1 guidelines recommended that the Councils could establish a process in their Statement of Organization, Practices and Procedures (SOPPs) for: establishing an ABC control rule, applying the ABC control rule (i.e., calculating the ABC), and reviewing the resulting ABC. NMFS believes that this may have caused confusion and that some commenters misunderstood the intent of this recommendation. NMFS received comment regarding inclusion of the ABC control rule in the SOPPs, and wants to clarify that the actual ABC control rule should be described in the FMP. NMFS believes it is important to understand how the Councils, SSC, and optional peer review process work together to implement the provisions of the MSA and therefore recommends that the description of the roles and responsibilities of the Council, SSC, and optional peer review process be included in the SOPPs, FMP, or some other public document. The SSC recommends the ABC to the Council whether or not a peer review process is utilized.

E. Management Uncertainty and Scientific Uncertainty

A major aspect of the revised NS1 guidelines is the concept of incorporating management and scientific uncertainty in using ACLs and AMs. Management uncertainty occurs because of the lack of sufficient information about catch (*e.g.*, late reporting, underreporting and misreporting of landings or bycatch). Recreational fisheries generally have late reporting because of the method of surveying catches and the lack of an ability for managers to interview only marine recreational anglers. NMFS is addressing management uncertainty in the recreational fishery by implementing a national registry of recreational fishers in the Exclusive Economic Zone (EEZ) (see proposed rule published in the **Federal Register** (73 FR 33381, June 12, 2008)) and a Marine Recreational Implementation Program that will, in part, revise the sampling design of NMFS's marine recreational survey for fishing activity.

Management uncertainty also exists because of the lack of management precision in many fisheries due to lack of inseason fisheries landings data, lack of inseason closure authority, or the lack of sufficient inseason management in some FMPs when inseason fisheries data are available. The final NS1 guidelines revisions provide that FMPs should contain inseason closure authority that gives NMFS the ability to close fisheries if it determines, based on data that it deems sufficiently reliable, that an ACL has been exceeded or is projected to be reached, and that closure of a fishery is necessary to prevent overfishing. NMFS believes that such closure authority will enhance efforts to prevent overfishing. Councils can derive some idea of their overall extent of management uncertainty by comparing past actual catches to target catches to evaluate the magnitude and frequency of differences between actual catch and target catch, and how often actual catch exceeded the overfishing limit for a stock.

Scientific uncertainty includes uncertainty around the estimate of a stock's biomass and its maximum fishing mortality threshold (MFMT); therefore, any estimate of OFL has uncertainty. Stock assessment models have various sources of scientific uncertainty associated with them and many assessments have shown a repeating pattern that the previous assessment overestimated near-future biomass, and underestimated near-future fishing mortality rates (i.e., called retrospective patterns).

V. Response to Comments

NMFS received many comments about the proposed definition framework (OFL ≥ ABC ≥ ACL ≥ ACT), especially regarding the ACT and ACT control rule. Some commenters suggested that the ACT and ACT control rule should not be required, while others supported their use. NMFS also received comments expressing: That the proposed terminology should not be required; OFL should always be greater than ABC; and concern that too many factors (i.e., management and scientific uncertainty, and ACT) will reduce future target catches unnecessarily. Some commenters felt additional emphasis should be placed on T_{min} in the rebuilding provisions. Councils, for the most part, are very concerned about the challenge of implementing ACLs and AMs by 2010, and 2011, as required. Some commenters felt the international fisheries exception to ACLs is too broad. Several commenters stated that an EIS should have been or should be prepared and two commenters stated an Initial Regulatory Flexibility Analysis under the Regulatory Flexibility Act should be prepared. NMFS also received many comments regarding the mixed-stock exception.

NMFS received many comments expressing support for the proposed revisions to the Magnuson-Stevens Act National Standard 1 guidelines. Comments included: This good faith effort to implement Congress' intent will work to end overfishing and protect the marine ecosystem; these guidelines reduce the risk of overfishing and will work to rebuild depleted stocks through the use of science based annual catch limits, accountability measures, 'buffers' for scientific and management uncertainty, and protections for weak fish stocks; and this solid framework will ensure not only healthy stocks but healthy fisheries.

Comment 1: Several comments were received regarding NMFS's decision to not prepare an environmental impact statement or environmental assessment for this action. Some supported the decision, while others opposed it and believed that a categorical exclusion under the National Environmental Policy Act (NEPA) is not appropriate.

Response: NMFS believes a categorical exclusion is appropriate for this action. Under §§ 5.05 and 6.03c.3(i) of NOAA's Administrative Order (NAO) 216–6, the following types of actions may be categorically excluded from the requirement to prepare an EA or EIS: ''* * * policy directives, regulations and guidelines of an administrative, financial, legal, technical or procedural nature, or the environmental effects of which are too broad, speculative or conjectural to lend themselves to meaningful analysis and will be subject later to the NEPA process, either collectively or case-by-case. * * *''

In this instance, a Categorical Exclusion is appropriate for this action, because NMFS cannot meaningfully analyze potential environmental, economic, and social impacts at this stage. This action revises NS1 guidelines, which are advisory only; MSA provides that NS guidelines ''shall not have the force and effect of law.'' MSA section 301(b). *See Tutein* v. *Daley*, 43 F. Supp.2d 113, 121–122 (D. Mass. 1999) (reaffirming that the guidelines are only advisory and holding that the national standards are not subject to judicial review under the

MSA). The NS1 guidelines are intended to provide broad guidance on how to comply with new statutory requirements. While the guidelines explain in detail how different concepts, such as ACL, ABC, MSY, and OY, should be addressed, the guidelines do not mandate specific management measures for any fishery. It is not clear what Councils will or will not do in response to the NS1 guidelines. Thus, it is not possible to predict any concrete impacts on the human environment without the necessary intervening actions of the Councils, e.g., consideration of best available scientific information and development of specific conservation and management measures that may be needed based on that information. Any analysis of potential impacts would be speculative at best.

None of the exceptions for Categorical Exclusions provided by § 5.05c of NAO 216–6 apply. While there is controversy concerning the NS1 guidelines revisions, the controversy is primarily related to different views on how new MSA requirements should be interpreted, rather than potential environmental consequences. The NS1 guidelines would not, in themselves, have uncertain environmental impacts, unique or unknown risks, or cumulatively significant or adverse effects upon endangered or threatened species or their habitats. Moreover, this action would not establish a precedent or decision in principle about future proposals. As noted above, the guidelines provide broad guidance on how to address statutory requirements but do not mandate specific management actions.

Comment 2: One commenter criticized NMFS' approach as placing unnecessary burden on the Councils to conduct the NEPA analysis.

Response: No change was made. One of the Councils' roles is to develop conservation and management measures that are necessary and appropriate for management of fisheries under their authority. NMFS believes that Councils should continue to have the discretion to determine what measures may be needed in each fishery and what alternatives should be considered and analyzed as part of the fishery management planning process. Councils routinely incorporate NEPA into this process, and the actions to implement ACLs in specific fisheries must address the NEPA requirements, regardless of the level of analysis conducted for the guidelines. Therefore, having reviewed the issue again, NMFS continues to find that a categorical exclusion is appropriate for this action.

Comment 3: Two commenters stated that NMFS should have prepared an initial regulatory flexibility analysis under the RFA for this action. They said it was not appropriate to certify under the RFA because in their opinion, this action will have significant economic impacts on a substantial number of small entities.

Response: No change was made. The final NS1 guidelines will not have significant economic impacts on a substantial number of small entities. The guidelines are advisory only; they provide general guidance on how to address new overfishing, rebuilding, and related requirements under the MSA. Pursuant to MSA section 301(b), the guidelines do not have the force and effect of law. When the Councils/Secretary apply the guidelines to individual fisheries and implement ACL and AM mechanisms, they will develop specific measures in their FMPs and be able to analyze how the new measures compare with the status quo (e.g., annual measures before the MSRA was signed into law and the NS1 guidelines were revised) with respect to economic impacts on small entities. At this point, any analysis of impacts on small entities across the range of diverse, Federally-managed fisheries would be highly conjectural. Therefore, a certification is appropriate.

Comment 4: Several comments were received that the guidelines are too complex and they contain guidance for things, such as the ACT that are not required by the MSA. They suggested removing these provisions from the guidance, or only providing guidance for terms specifically mentioned in the statute.

Response: NMFS agrees that the guidelines can appear complex. However, the purpose of the guidelines is not simply to regurgitate statutory provisions, rather it is to provide guidance on how to meet the requirements of the statute. As discussed in other comments and responses, MSRA includes new, undefined terms (ABC and ACL), while retaining other long-standing provisions, such as the national standards. In considering how to understand new provisions in light of existing ones, NMFS considered different ways to interpret language in the MSA, practical challenges in fisheries management including scientific and management uncertainty, the fact that there are differences in how fisheries operate, and public comment on proposed approaches in the NS1 guidelines. MSA does not preclude NMFS from including additional terminology or explanations in the NS1 guidelines, as needed, in order to facilitate understanding and effective implementation of MSA mandates. In the case of NS1, conservation and management measures must prevent overfishing while achieving, on a continuing basis, the optimum yield. This is inherently challenging because preventing overfishing requires that harvest of fish be limited, while achieving OY requires that harvest of fish occur. In developing the guidelines, NMFS identified the reasons that overfishing was still occurring in about 20 percent of U.S. Fisheries, and wrote the guidelines to address the primary causes. These include:

(1) Setting OY too close to MSY,

(2) Failure to consider all sources of fishing mortality,

(3) Failure to adequately consider both uncertainty in the reference points provided by stock assessments (scientific uncertainty) and uncertainty in management control of the actual catch (management uncertainty),

(4) Failure to utilize best available information from the fishery for inseason management, and

(5) Failure to identify and correct management problems quickly.

NMFS believes that the guidelines address these causes and appropriately provide practical guidance on how to address them, while providing sufficient flexibility to acknowledge the differences in fisheries. NMFS believes that Congress intended that the ACLs be effective in ending and preventing overfishing. Simply amending the FMPs to include ACL provisions is not enough—the actual performance of the fishery is what ultimately matters. NMFS believes that all of the provisions in the guidelines are essential to achieving that goal, and that if the guidelines are followed, most of the problems that have led to continued overfishing will be addressed. NMFS has made changes in the final action to clarify the guidelines and simplify the provisions therein, to the extent possible. One specific change is that the final guidelines do not require that ACT always be established. Instead, NMFS describes how catch targets, such as ACT, would be used in a system of AMs in order to meet the requirements of NS1 to prevent overfishing and achieve OY. More details on these revisions are covered in responses pertaining to comments 8, 32, 44, 45, and 48.

Comment 5: Several commenters stated that Councils' workloads and the delay of final NS1 guidelines will result in some Councils having great difficulty or not being able to develop ACLs and AMs for overfishing stocks by 2010, and all other stocks by 2011.

Response: The requirements in MSA related to 2010 and 2011 are statutory; therefore ACLs and AMs need to be in place for those fishing years such that overfishing does not occur. NMFS understands that initial ACL measures for some fisheries have been developed before the NS1 guidelines were finalized in order to meet the statutory deadline, and thus may not be fully consistent with the guidelines. ACL mechanisms developed before the final guidelines should be reviewed and eventually revised consistent with the guidelines.

Comment 6: Several commenters stated that certain existing FMPs and processes are already in compliance with the ACL and AM provisions of the MSA and consistent with the proposed guidelines. One commenter stated that NMFS should bear the burden of determining whether current processes are inconsistent with the MSA, and indicate what action Councils should take. Another commenter stated that Congress intended Total Allowable Catch (TAC), which is already used in some fisheries, to be considered to be an ACL. NMFS also received comments stating that certain terms have had longstanding use under FMPs, and changing the terminology could cause too much confusion.

Response: NMFS believes that some existing FMPs may be found to need little or no modification in order to be found to be consistent with the MSA and NS1 guidelines. In general, these are fisheries where catch limits are established and the fishery is managed so that the limits are not exceeded, and where overfishing is not occurring. NMFS agrees that, in some fisheries, the TAC system currently used may meet the requirements of an ACL. However, there are a wide variety of fisheries that use the term TAC, and while some treat it as a true limit, others treat it simply as a target value on which to base management measures. Therefore, NMFS does not agree that the use of a TAC necessarily means the fishery will comply with the ACL and AM provisions of the MSA. NMFS will have to review specific FMPs or FMP amendments. In addition, upon request of a Council, NMFS can provide input regarding any changes to current processes that might be needed for consistency with the MSA and guidance in the NS1 guidelines.

Regarding the comment about terminology, the preamble to the proposed action provided that Councils could opt to retain existing terminology and explain in a proposed rule how the terminology and approaches to the FMPs are consistent with those set forth in the NS1 guidelines. NMFS has given this issue further consideration and believes that a proposed rule would not be necessary or appropriate. Instead, a Council could explain in a **Federal Register** notice why its terminology and approaches are consistent with the NS1 guidelines.

Comment 7: Some commenters thought that before requiring implementation of a new management system, it should first be demonstrated that the current management system is not effective at preventing overfishing or rebuilding stocks that are overfished, and that a new management system would be more effective. Changing a management system that is effective and responsive would not be productive.

Response: While NMFS understands that current conservation and management measures prevent overfishing in some fisheries, the MSA requires a mechanism for specifying ACLs and AMs in all fisheries, including those that are not currently subject to overfishing, unless an exception applies. There is no exception to the requirement for ACLs and AMs for fisheries where other, non-ACL management measures are preventing overfishing. NMFS is required by the MSRA to implement the new provisions in all FMPs, unless an exception applies, even on those whose current management is preventing overfishing. NMFS believes the guidance provides the tools for Councils to implement ACLs in these fisheries that will continue to prevent overfishing without disrupting successful management approaches. The guidelines provide flexibility to deviate from the specific framework described in the guidelines, if a different approach will meet the statutory requirements and is more appropriate for a specific fishery (*see* § 600.310(h)(3) of the final action).

Comment 8: Some commenters supported the use of ACT to address management uncertainty in the fishery. Others did not support ACTs, and commented that ACTs are not required under the MSA and that inclusion of ACTs in the guidelines creates confusion and complexity. One commenter stated that the proposed guidelines were ''out of line'' with NMFS's mandate and authority provided under the MSA because the guidelines for ACTs and associated control rules completely undermine the clear directive Congress provides in National Standard 1 to achieve optimum yield on an ongoing basis.

Response: The proposed guidelines stressed the importance of addressing scientific and management uncertainty in establishing ACL and AM mechanisms. Scientific uncertainty was addressed in the ABC control rule, and management uncertainty was addressed in the ACT control rule. Use of catch targets associated with catch limits is a well-recognized principle of fishery management. The current NS1 guidelines call for establishment of limits, and targets set sufficiently below the limits so that the limits are not exceeded. The revised guidelines are based on this same principle, but, to incorporate the statutory requirements for ABC and ACLs, are more explicit than the current guidelines. While MSA does not refer to the term ACT, inclusion of the term in the NS1 guidelines is consistent with the Act. The NS1 guidelines are supposed to provide advice on how to address MSA requirements, including how to understand terminology in the Act and how to apply that terminology given the practical realities of fisheries management. In developing the proposed guidelines, NMFS considered a system that used ABC as the limit that should not be exceeded, and that required that ACL be set below the ABC to account for management uncertainty. This had the advantage of minimizing the number of terms, but would result in the ACL having been a target catch level. NMFS decided, that since Congress called for annual catch limits to be set, that the ACL should be considered a true limit—a level not to be exceeded. ACT was the term adopted for the corresponding target value which the fishery is managed toward so that the ACL is not exceeded.

Taking public comment into consideration, NMFS has decided to retain ACTs and ACT control rules in the final guidelines, but believes they are better addressed as AMs for a fishery. One purpose of the AMs is to prevent the ACL from being exceeded. Setting an ACT with consideration of management uncertainty is one way to achieve this, but may not be needed in all cases. In fisheries where monitoring of catch is good and in-season management measures are effective, managers may be able to prevent ACLs from being exceeded through direct monitoring and regulation of the fishery. Therefore, the final guidelines make ACTs optional, but, to prevent ACLs from being exceeded, Councils must adequately address the management uncertainty in their fisheries using the full range of AMs.

NMFS disagrees that ACTs undermine NS1. NS1 requires that conservation and management measures prevent overfishing while achieving, on a continuing basis, the OY. The MSA describes that OY is based on MSY, as reduced based on consideration of

several factors. In some cases, the amount of reduction may be zero, but in no case may the OY exceed MSY. Therefore, if OY is set close to MSY, the conservation and management measures in the fishery must have very good control of the amount of catch in order to achieve the OY without overfishing.

The amount of fishing mortality that results in overfishing is dictated by the biology of the stock and its environment, and establishes a limit that constrains fisheries management. However, the specification of OY and the conservation and management measures for the fishery are both set by fishery managers. To achieve the dual requirements of NS1, Councils must specify an OY and establish conservation and management measures for the fishery that can achieve the OY without overfishing. The closer that OY is set to MSY, the greater degree of control over harvest is necessary in order to meet both objectives. The choice of conservation and management measures for a fishery incorporates social and economic considerations. For example, a Council may prefer to use effort controls instead of hard quotas to have a year-round fishery without a ''race for fish,'' and to provide higher average prices for the fishermen. However, compared to hard quotas, management with effort controls gives more uncertainty in the actual amount of fish that will be caught. Because of this increased uncertainty, the OY needs to be reduced from MSY so that overfishing does not occur. Thus the social and economic considerations of the choice of management measures should be considered in setting the OY.

In cases where the conservation and management measures for a fishery are not capable of achieving OY without overfishing occurring, overfishing must be ended even if it means the OY is not achieved in the short-term. Overfishing a stock in the short term to achieve OY jeopardizes the capacity of the stock to produce OY in the long term, and thus cannot be sustained. Preventing overfishing in a fishery on an annual basis is important to ensure that a fishery can continue to achieve OY on a continuing basis. The specification of OY and the associated conservation and management measures need to be improved so that OY can be achieved without overfishing occurring. In a fishery where the NS1 objectives are fully met, the OY specification will adequately account for the management uncertainty in the associated conservation and management measures. Overfishing will not occur, and the OY will be achieved.

Comment 9: Commenters stated that the designation of the Virgin Islands Coral Reef Monument was not being taken into account in the Caribbean Council's FMPs.

Response: NMFS does not believe any revision of the NS1 guidelines is necessary in response to this comment but will forward the comment to the Council for its consideration.

Comment 10: NMFS received comments in support of the flexibility given to councils to manage stocks for which ACLs are not a good fit, such as management of Endangered Species Act listed species, stocks with unusual life history characteristics, and aquaculture operations. Commenters noted that Pacific salmon should be treated with flexibility under the NS1 guidelines, because they are managed to annual escapement levels that are functionally equivalent to ACLs, and there are accountability, review, and oversight measures in the fishery.

Response: NMFS agrees that flexibility is needed for certain management situations, and clarifies that § 600.310(h)(3) provides for flexibility in application of the NS1 guidelines but is not an exception from requirements of MSA section 303(a)(15) or other sections.

Comment 11: Congress did not mandate that all fisheries be managed by hard quotas, and so NMFS should include guidance for the continuation of successful, non-quota management systems, such as that used to successfully manage the Atlantic sea scallop fishery.

Response: NMFS agrees that the conservation and management measures for a fishery are not required to be ''hard quotas.'' However, NMFS believes that the ACL was intended by Congress to be a limit on annual catch. Therefore, conservation and management measures must be implemented so that the ACL is not exceeded, and that accountability measures must apply whenever the ACL is exceeded. Congress did not exempt any fisheries from the ACL requirement on the basis that current management was successful. If the current conservation and management measures are effective in controlling harvest of sea scallops such that the ACL is not regularly exceeded, the ACL would have little effect on the fishery. If the current management measures are not effective in keeping catch from exceeding the ACL, then consistent with the ACL requirement in the MSA, additional management action should be taken to prevent overfishing.

Comment 12: The summary list of items to be included in FMPs should be ''as appropriate'' (see § 600.310(c) of the final action).

Response: No change was made. NMFS believes that if any item does not apply to a particular fishery, the Council can explain why it is not included, but believes that ''as appropriate'' would create further confusion as there is no clear definition of what appropriate means in this context.

Comment 13: The list of items to include in FMPs related to NS1 is extremely long, and it is unclear whether each item on the list needs to be addressed for all stocks that are ''in the fishery,'' which is a very broad term. Including the extra information is unlikely to materially improve management.

Response: As a default, all the stocks or stock complexes in an FMP are considered ''in the fishery'' (see § 600.310(d)(1)), unless they are reclassified as ecosystem component stocks through an FMP amendment process. Further explanation of these classifications is provided below in other comments and responses. The benefit of including this list of items is to provide transparency in how the NS1 guidelines are being met. In addition, Councils should already have some of the items in their FMPs (ex: MSY, status determination criteria (SDC), and OY). The other items are new requirements of the MSA or a logical extension of the MSA.

Comment 14: NMFS received several comments both supporting and opposing the proposed ''stocks in a fishery'' and ''ecosystem component species'' (EC) classifications of stocks in a FMP. Comments included: EC species are not provided under the MSA and should not be required in FMPs; EC species classification is needed but may lead to duplication in different FMPs; support for the distinction between ''stocks in a fishery'' and EC species; and clarify how data collection only species should be classified.

Response: NMFS provided language for classifying stocks in a FMP into two categories: (1) ''Stocks in the fishery'' and (2) ''ecosystem component species.'' MSA requires that Councils develop ACLs for each of their managed fisheries (see MSA sections 302(h)(6) and 303(a)(15)), but Councils have had, and continue to have, considerable discretion in defining the ''fishery'' under their FMPs. As a result, some FMPs include one or a few stocks (*e.g.* , Bluefish FMP, Dolphin-Wahoo FMP) that have been traditionally managed for OY, whereas others have begun including hundreds of species (e.g., Coral Reef Ecosystem of the Western Pacific Region FMP) in an

effort to incorporate ecosystem approaches to management.

While EC species are not explicitly provided in the MSA, in the MSRA, Congress acknowledged that certain Councils have made significant progress in integrating ecosystem considerations, and also included new provisions to support such efforts (*e.g.*, MSA section 303(b)(12)). As noted in the preamble of this action, NMFS wants to continue to encourage Councils to incorporate ecosystem considerations, and having classifications for ''stocks in the fishery'' versus ''ecosystem component species'' could be helpful in this regard. Thus, the final guidelines do not require Councils or the Secretary to change which species are or are not included in FMPs, nor do the guidelines require FMPs to incorporate the EC species classification. NMFS has revised the final guidelines to state explicitly that Councils or the Secretary may—but are not required to—use an EC species classification.

In developing the text regarding EC species and ''stocks in the fishery,'' NMFS examined what existing FMPs are already doing and utilized that in its description of these classifications. For example, based on existing FMPs, the guidelines envision that species included for data collection and other monitoring purposes could be considered EC species (assuming they meet the criteria described in § 600.310(d)(5)(i)). However, such species could also be ''stocks in the fishery,'' as described under the NS3 guidelines (§ 600.320(d)(2)). NMFS recognizes the desire for greater specificity regarding exactly which species could or could not be considered EC species, but does not believe that further detail in the guidelines could clarify things definitively. Determining whether the EC category is appropriate requires a specific look at stocks or stock complexes in light of the general EC species description provided in the NS1 guidelines as well as the broader mandates and requirements of the MSA. If Councils decide that they want to explore potential use of the EC species classification, NMFS will work closely with them to consider whether such a classification is appropriate.

Comment 15: NMFS received several comments regarding the level of interaction that would be appropriate for the EC classification. Comments included: *de minimis* levels of catch should be defined to clarify the difference between ''stocks in a fishery'' and EC species; all stocks that interact with a fishery should be included as ''stocks in a fishery''; requiring non-target stocks to be considered part of the fishery as written supersedes NS9; guidelines should clarify that EC species do not have significant interaction with the fishery; and, bycatch species should not be included as ''stocks in a fishery.''

Response: NMFS is revising the final guidelines to clarify preliminary factors to be taken into account when considering a species for possible classification as an EC species. Such factors include that the species should: (1) Be a non-target species or non-target stock; (2) not be determined to be subject to overfishing, approaching overfished, or overfished; (3) not likely to become subject to overfishing or overfished, according to the best available information, in the absence of conservation and management measures; and (4) not generally retained for sale or personal use. Factors (2) and (3) are more relevant to species that are currently listed in FMPs and that have specified SDCs. With regard to factor (4), the final guidelines add new language in § 600.310(d)(5)(i)(D)—''not generally retained for sale or personal use''—in lieu of ''*de minimis* levels of catch'' and clarify that occasional retention of a species would not, in itself, preclude consideration of a species in the EC classification. The NS1 guidelines provide general factors to be considered, as well as some examples of possible reasons for using the EC category. However, the decision of whether to use an EC classification requires consideration of the specific fishery and a determination that the EC classification will be consistent with conservation and management requirements of the MSA.

Under the MSA, a Council prepares and submits FMPs for each fishery under its authority that requires conservation and management, and there is considerable latitude in the definition of the fishery under different FMPs. The definition of ''fishery'' is broad, and could include one or more stocks of fish treated as a unit for different purposes, as well as fishing for such stock (see MSA section 3(13)(B)). While some comments encouraged inclusion of all species that might interact with a fishery, all bycatch species, or all species for which there may be ''fishing'' as defined in MSA section 3(13)(B), NMFS does not believe that MSA mandates such a result. MSA does not compel FMPs to include particular stocks or stock complexes, but authorizes the Councils or the Secretary to make the determination of what the conservation and management needs are and how best to address them. Taking the broader approaches noted above would interfere with this discretion and also could result in overlapping or duplicative conservation and management regimes in multiple FMPs under different Council jurisdictions. As National Standard 6 requires that conservation and management measures, where practicable, minimize costs and avoid unnecessary duplication, NMFS believes that Councils should retain the discretion to determine which fisheries require specific conservation and management measures. With regard to bycatch, regardless of whether a species is identified as part of a fishery or not, National Standard 9 requires that FMPs, to the extent practicable, minimize bycatch and to the extent it cannot be avoided minimize bycatch mortality. Additional protections are afforded to some species under the Endangered Species Act, regardless of whether they are listed as stocks in a fishery. Further, as a scientific matter, NMFS disagrees that every bycatch species would require conservation and management measures to protect the species from becoming overfished, because some bycatch species exhibit high productivity levels (*e.g.*, mature early) and low susceptibilities to fishery (*e.g.*, rarely captured) that preclude them from being biologically harmed or depleted by particular fisheries.

Comment 16: NMFS received several comments requesting that the guidelines include a description of vulnerability and how it should be determined, since it is referenced throughout the guidelines.

Response: NMFS agrees, and has added § 600.310(d)(10) to the final action, to define vulnerability. In general, to determine the vulnerability of a species/stock becoming overfished, NMFS suggests using quantitative estimates of biomass and fishing rates where possible; however, when data are lacking, qualitative estimates can be used. NMFS is currently developing a qualitative methodology for evaluating the productivity and susceptibility of a stock to determine its vulnerability to the fishery, and anticipates the methodology to be finalized by February 2009. The methodology is based on the productivity-susceptibility analysis (PSA) developed by Stobutzki *et al.* (2001), which was suggested by many commenters. Stocks that have low susceptibilities (*e.g.*, rarely interact with the fishery, no indirect impacts to habitat, etc.) and high productivities (*e.g.*, mature at an early age, highly fecund, etc.) are considered to have a low vulnerability of becoming overfished, while stocks that have low productivities and high susceptibilities

to the fishery are considered highly vulnerable to becoming overfished.

Comment 17: Some commenters noted that the EC classification could be used to avoid reference point specification.

Response: NMFS believes that the guidelines provide mechanisms to address this issue. As a default, NMFS presumes that all stocks or stock complexes that Councils or the Secretary decided to include in FMPs are ''stocks in the fishery'' that need ACL mechanisms and AMs and biological reference points. Whether it would be appropriate to include species in the EC category would require consideration of whether such action was consistent with the NS1 guidelines as well as the MSA as a whole. If a Council or the Secretary wishes to add or reclassify stocks, a FMP amendment would be required, which documents rationale for the decision. However, the guidelines have been modified to note that EC species should be monitored to the extent that any new pertinent scientific information becomes available (*e.g.*, catch trends, vulnerability, etc.) to determine if the stock should be reclassified.

Comment 18: With regard to ecological, economic, and social (EES) factors related to OY, some commenters requested more specific guidance in incorporating the factors, and others commented that accounting for the factors is too time consuming. Other commenters expressed support for the reference to forage fish species and suggested including text on maximum economic yield and fish health.

Response: The NS1 guidelines generally describe OY as the long-term average amount of desired yield from a stock, stock complex, or fishery. OY is prescribed on the basis of MSY as reduced by EES factors (MSA section 3(33)). The NS1 guidelines set forth examples of different considerations for each factor, and NMFS believes the examples provide sufficient guidance on EES factors. NMFS has not made substantive changes from the proposed action, but has clarified that FMPs must address each factor but not necessarily each example.

Comment 19: NMFS received several comments in support of using stock complexes as a management tool in data poor situations and other comments that expressed concern about the use of stock complexes and indicator species. Comments included: stock complexes should only be used when sufficient data are lacking to generate species-specific SDCs and related reference points; there is little ecological basis for using indicator species to set ACLs for stock complexes (see Shertzer and Williams (2008)) as stocks within a stock complex exhibit different susceptibilities to the fishery; if used, stock complexes should be managed using the weakest or most vulnerable stock within the complex as a precautionary approach to management; it would be helpful to have examples of how a data poor stock could be periodically examined to determine if the stock is overfished or subject to overfishing.

Response: NMFS agrees that where possible Councils should generate stock-specific SDCs and related reference points for stocks in fishery; however, there are other circumstances in which stock complex management could be used. NMFS notes in § 600.310(d)(8) of the final action that stocks may be grouped into complexes for various reasons, including: where stocks in a multispecies fishery cannot be targeted independent of one another and MSY can not be defined on a stock-by-stock basis (see § 600.310(e)(1)(iii) of the final action); where there is insufficient data to measure their status relative to SDC; or when it is not feasible for fishermen to distinguish individual stocks among their catch.

NMFS believes that the guidelines sufficiently addressed the issue that stock complexes should be managed using the most vulnerable stock within the complex. In § 600.310(d)(9) of the final action the guidelines note that ''if the stocks within a stock complex have a wide range of vulnerability, they should be reorganized into different stock complexes that have similar vulnerabilities; otherwise the indicator stock should be chosen to represent the more vulnerable stocks within the complex. In instances where an indicator stock is less vulnerable than other members of the complex, management measures need to be more conservative so that the more vulnerable members of the complex are not at risk from the fishery.'' Additionally, these guidelines address the concerns of Shertzer and Williams (2008), by recommending that both productivity and susceptibility of the stock (*i.e.*, vulnerability to the fishery) is considered when creating or re-organizing stock complexes.

Lastly, NMFS agrees and has modified the phrase in § 600.310(d)(9) of the proposed action ''Although the indicator stock(s) are used to evaluate the status of the complex, individual stocks within complexes should be examined periodically using available quantitative or qualitative information to evaluate whether a stock has become overfished or may be subject to overfishing'' to provide examples of quantitative or qualitative analysis.

Comment 20: NMFS received comments regarding the process for specifying the ACL for either a stock complex or for a single indicator species. The commenters were concerned that the proper data will not be utilized to determine whether the ACL should be set for the stock complex or for single indicator species. They feel that the use of single indicator species would not represent the stock's abundance, especially in the St. Thomas/St. John and St. Croix fisheries.

Response: NMFS understands the concern, but does not believe the guidelines need to be revised. NMFS will refer this comment to the Council.

Comment 21: NMFS received comments stating that the final action should clarify how SDCs and ACLs should be applied to stocks that are targeted in one fishery and bycatch in another, as well as circumstances where the stock is targeted by two or more FMPs that are managed by different regional councils.

Response: NMFS believes that the guidelines sufficiently addressed this issue in § 600.310(d)(7) of the final action, which notes ''* * * Councils should choose which FMP will be the primary FMP in which management objectives, SDC, the stock's overall ACL and other reference points for the stock are established.'' NMFS believes that the Councils should continue to have the discretion to make such determinations. NMFS, however, suggests that the primary FMP should usually be the FMP under which the stock is targeted. In instances where the stock is targeted in two or more FMPs (*e.g.*, managed by two or more Councils), Councils should work together to determine which FMP is the primary.

Comment 22: Several commenters requested further clarification on how prohibited species should be classified under the proposed classification scheme (see § 600.310(d)) because they felt it was unclear whether a species for which directed catch and retention is prohibited would be classified as ''in the fishery'' or as an ''ecosystem component''.

Response: NMFS believes that the information in § 600.310(d) provides a sufficient framework in which decisions can be made about how to classify a prohibited species under an FMP. Prohibition on directed catch and/or retention can be applied to either a stock that is ''in the fishery'' or an ''ecosystem component'' species. Managers should consider the classification scheme outlined in § 600.310(d) of the final action as well

as MSA conservation and management requirements generally. If a stock contains one of the ''in the fishery'' characteristics, then it belongs ''in the fishery'', regardless of the management tools that will be applied to it (*e.g.*, prohibition, bag limits, quotas, seasons, etc.). Also, if the intent is to prohibit directed fishing and retention throughout the exclusive economic zone (EEZ) for which a Council has jurisdiction, then the stock would, most likely, be identified in an FMP as ''in the fishery'' rather than as an ecosystem component of one particular FMP.

Comment 23: Several commenters asked at what level an ACL would be specified for a species for which directed catch and retention is prohibited. Setting the ACL at zero would not be logical because if even one was caught incidentally then AMs would be triggered. Setting it higher would also not be logical because the point is to ensure little to no catch of the stock.

Response: Prohibiting retention is a management measure to constrain the catch to a minimal amount. If listed as a stock in the fishery, the reference points for the species, such as OFL and ABC, should be set based on the MSY for the stock, or, if ESA listed, would be set according to the associated ESA consultation's incidental take statement, regardless of the management approach used. The ACL may not exceed the ABC, but should be set at a level so that the mortality resulting from catch and discard is less than the ACL.

Comment 24: NMFS received a comment stating that the specification of MSY must incorporate risk, be based on gear selectivity and support a healthy, functioning ecosystem. The commenter supported revisions to § 600.310(e)(1) of the proposed action but suggested that it should be strengthened to address ecosystem principles. The commenter cited NOAA Tech Memo NMFS–F/SPO–40 in contending that the concept of MSY contains inherent risks that must be addressed in establishing reference points. Other commenters stated that: Councils establish management measures with high probabilities of success (*e.g.*, 80 percent); ''fishery technological characteristics'' should be re-evaluated every two years; and MSY values normally equate to fishing down a population to forty percent of historic abundance and this may not be consistent with ecosystem based management.

Response: NMFS agrees that ecological conditions and ecosystem factors should be taken into account when specifying MSY and has added additional language to § 600.310(e)(1)(iv) of the final action to highlight this point. Such factors might include establishing a higher target level of biomass than normally associated with the specific stock's B_{msy}. In addition, ecological conditions not directly accounted for in the specification of MSY can be among the ecological factors considered when setting OY below MSY. Regarding the comment about establishing management measures with a high probability of success, this is addressed in comment #63. NMFS does not believe that the NS1 guidelines need to be revised to require that fishery technological characteristics be evaluated every 2 years; such characteristics would be routinely updated with each stock assessment. The MSA bases management of fishery resources on MSY, but provides that OY can be reduced from MSY for ecological factors. NMFS believes the guidelines are consistent with the MSA and allow Councils to implement ecosystem approaches to management.

Comment 25: Several comments requested the guidelines state that specification of reference points should not be required for a stock ''in the fishery'' if its directed catch and retention is prohibited because managers applied the prohibition in an effort to prevent overfishing.

Response: Prohibition of retention does not necessarily mean that overfishing is prevented. Even though the species cannot be retained, the level of fishing mortality may still result in overfishing. Many stocks for which prohibitions are currently in place are considered data-poor. NMFS acknowledges that specifying reference points and AMs will be a challenge for such stocks, but reiterates the requirement to establish ACLs and AMs for all managed fisheries, unless they fall under the two statutory exceptions (see § 600.310(h)(2) of the final action), and also the need to take into consideration best scientific information available per National Standard 2.

Comment 26: NMFS received comments voicing a concern about the NMFS process of determining the overfishing status of a fishery, because fishery management measures have been implemented to end overfishing, but stocks are still listed as subject to overfishing and require ACLs by 2010. The commenters felt that several species under the Caribbean Fishery Management Council's protection should currently be removed from the overfished species list.

Response: NMFS agrees that this is an important issue. Due to the process inherent in determining the status of a stock there is inevitably a lag time between implementation of management measures and a new assessment of the stock's status under those measures. NMFS is required by the MSA to establish new requirements to end and prevent overfishing through the use of ACLs and AMs. The fisheries subject to overfishing, including several in the Caribbean, are required to have ACLs by 2010, and all other fisheries must have ACLs by 2011. The Council's Comprehensive Amendment that implemented the Sustainable Fisheries Act in 2006 included measures designed to end overfishing. Although these measures may have ameliorated fishing pressure for some fishery resources in the U.S. Virgin Islands, the Council will need to evaluate the existing fishery management measures to determine whether they are sufficient to meet the new statutory requirements for ACLs and AMs.

Comment 27: Several commenters stated that NMFS should not include the OFL as the basis for overfishing SDC. Specific comments included: (1) The MSA does not define or require OFL, so NMFS should not use it in the guidelines; (2) catch-based SDC are inconsistent with the Magnuson-Stevens Act intent and SDC should only be based on the fishing mortality rate as it relates to a stock or stock complex's capacity to achieve MSY on a continual basis; (3) the Magnuson-Stevens Act does not require use of the long term average OFL as MSY; (4) NMFS increases the risk of overfishing when theoretical catch estimates or a constant fishing mortality rate (F) are used to manage a fishery especially when a retrospective pattern exists in a stock or stock complex.

Response: The term, OFL, is not defined in the MSA. However, OFL is directly based on requirements of the MSA, including the concept of MSY, and the requirement to prevent overfishing. NMFS does not believe that lack of a definition in the MSA precludes definition and use of OFL in order to meet the objectives of the MSA. The MSA defines overfishing as a rate or level of fishing mortality that jeopardizes the capacity of the stock to produce MSY. This mortality rate is defined by NMFS as the MFMT. The OFL for a year is calculated from the MFMT and the best estimate of biomass for a stock in that year, and thus is simply the MFMT converted into an amount of fish. The OFL is an annual level of catch that corresponds directly to the MFMT, and is the best estimate of the catch level above which overfishing is occurring. OFL is in terms

of catch, and thus is in the same units as ABC and ACL. NMFS believes, therefore, that comparing catch to OFL is a valid basis for determining if overfishing has occurred that year. The relationship of MSY to OFL is that MSY is the maximum yield that the stock can provide, in the long term, while OFL is an annual estimate of the amount of catch above which overfishing is occurring. The annual OFL varies above and below the MSY level depending on fluctuations in stock size. Since both MSY and OFL are related to the highest fishing mortality rate that will not result in overfishing, it is expected that the long-term average of OFLs would equate to MSY, provided that the stock abundance is high enough to support MSY.

The NS1 guidelines give the Councils flexibility to determine if overfishing occurs by using either MFMT (F > MFMT) or actual annual catch (catch > OFL) as the criteria for overfishing determinations. There are advantages and disadvantages of using either measure. The advantages of using OFL as a SDC are that catch can be easily understood by constituents, a determination can be made as soon as catch totals are available, and there is no retrospective problem with setting the SDC itself. Use of OFL might not be appropriate for stocks with highly variable recruitment that can not be predicted and therefore incorporated into the forecast of stock condition on which OFL is based. The advantage of using MFMT to determine if overfishing is occurring is because F is based on a stock assessment analyzing the past performance of the fishery. This means that the MFMT method is less sensitive than the OFL method to recent fluctuations in recruitment. However, F cannot not be calculated until an assessment has been updated, which may lag the fishery by several years. Therefore, a status determination based on MFMT could be less current than a determination based on OFL and catch, and reflects past, rather than current, fishery performance. Also, if there is a retrospective pattern in the assessment, then the hindsight estimate of F for a particular year used for the SDC will be different than the forecast estimate of stock condition used when setting target catch levels and management measures for that same year. The choice of SDC for a stock should consider things like the frequency of stock assessments, the ability to forecast future stock size, and any known retrospective patterns in the assessment. If the SDC are appropriately chosen, NMFS does not believe that one method necessarily presents more risk that overfishing will occur.

Comment 28: NMFS received one comment which proposed that instead of being required to choose between OFL or MFMT as the SDC, that Councils should have the flexibility to use both. The comment implied that this would allow Councils to use MFMT as the SDC in years in which there is an assessment and OFL in years in which there is not an assessment.

Response: The NS1 guidelines require documentation for the rationale a Council uses to select the SDC within the FMP including defining overfishing status in terms of the MFMT (*i.e.*, fishing mortality rate) or OFL (*i.e.*, annual total catch) in such a way that overfishing can be monitored and determined on an annual basis. A Council could develop SDC based on both criteria, if sufficient rationale is provided.

Comment 29: NMFS received two comments in opposition to the ''overfished'' definition used by NMFS in the proposed rule. They point out that the current overfished definition could include stocks that are ''depleted'' due to changing environmental conditions not caused by fishing pressure. They propose that NMFS should revise the definition of ''overfished'' and create a ''depleted'' category for stocks that have declined below the minimum stock size threshold (MSST) due to changing environmental conditions.

Response: The overfished definition used by NMFS is consistent with the MSA. NMFS acknowledges that factors other than fishing mortality can reduce stock size below the MSST but NMFS believes the definition of overfished should not be altered. For stocks in a FMP, the MSA requires the Councils to rebuild the stock to a level consistent with producing the MSY regardless of the contributing factors. In most cases, the variation in relative contribution of environmental and fishing factors from year to year in reducing stock abundance is not known. When specifying SDC the Council is required to provide an analysis of how the SDC were chosen and how they relate to the reproductive potential of the stock. Specifically, the MSST should be expressed in terms of reproductive potential or spawning biomass. Furthermore, the stock assessment process can adjust the B_{msy} estimates and associated SDC due to environmental and ecological factors or changes in the estimates of reproductive potential, size/age at maturity, or other biological parameters.

Comment 30: Several comments suggested that NMFS should strike § 600.310(e)(2)(iii)(B) from the proposed action as it contradicts § 600.310(e)(2)(iii)(A) and could increase fishing pressure on a depleted stock by attributing low stock abundance to environmental conditions. Commenters criticized the requirement at § 600.310(e)(2)(iii)(B) that Councils ''must'' take action to modify SDC, and stated that there is little scientific evidence to show linkages between stock size and environmental conditions (citing to Restrepo *et al.* 1998 and NMFS. 2000. Endangered Species Act—Section 7 Consultation Biological Opinion and Incidental Take Statement). Commenters asserted that there is no statutory basis for this provision in the MSA and the legal standard for the word ''affect'' is vague and inadequate for ending overfishing. The comments stated that, in a time of anthropogenic climate change, stock dynamics are likely to change and by establishing this provision in the final action NMFS will undermine the statute's mandate to end overfishing. Commenters asserted that fisheries managers have and will respecify SDC to justify circumventing rebuilding targets, and the final guidelines should establish a high burden of proof to modify SDC due to changing environmental conditions or ''regime change'' (citing Fritz & Hinckley 2005).

Response: Section 600.310(e)(2)(iii) of this final action is essentially the same as text at § 600.310(d)(4) in the current NS1 guidelines, except for clarifications noted below. There is no change in the usage of ''must'' between the current guidance and this final NS1 guidance at § 600.310(e)(2)(iii). NMFS believes that the requirement of NS2, that conservation and management measures be based on the best available science, applies to the establishment of SDC. Therefore, in cases where changing environmental conditions alter the long-term reproductive potential of a stock, the SDC must be modified. As stocks and stock complexes are routinely assessed, long-term trends are updated with current environmental, ecological, and biological data to estimate SDCs. NMFS allows for flexibility in these provisions to account for variability in both environmental changes and variation in a stock's biological reaction to the environment.

The guidelines include language requiring a high standard for changing SDC that is consistent with NMFS Technical Guidance (Restrepo *et al.* 1998). NMFS outlines the relationship of SDC to environmental change in both the short and long-term in

§ 600.310(e)(2)(iii) of the final action. Total mortality of fish stocks includes many factors other than fishing mortality. Short-term environmental changes may alter the size of a stock or complex, for instance, by episodic recruitment failures, but these events are not likely to change the reproductive biology or reproductive potential of the stock over the long-term. In this case the Council should not change the SDC. Other environmental changes, such as some changes in ocean conditions, can alter both a stock's short-term size, and alter long-term reproductive biology. In such instances the Councils are required to respecify the SDC based on the best available science and document how the changes in the SDC relate to reproductive potential. In all cases, fishing mortality must be controlled so that overfishing does not occur. NMFS notes that, depending on the impact of the environmental change on the stock, failure to respecify SDC could result in overfishing, or could result in failure to achieve OY. In both cases, the fishery would not meet the requirements of NS1.

One change from § 600.310(d)(4) of the current NS1 guidelines occurs in § 600.310(e)(2)(iii)(A) of this final action. NMFS clarified that SDC ''should not'' rather than ''need not'' be changed if the long-term reproductive potential of a stock has not been affected by a changing environment. NMFS feels that this is consistent with setting a high standard for changing the SDC due to environmental changes. In addition, this action changes the phrase ''long-term productive capacity'' from the current NS1 guidance to ''long-term reproductive potential.'' NMFS believes the latter phrase is clearer and more accurately reflects the language in MSA section 303(a)(10).

Any changes to SDC are subject to Secretarial approval (§ 600.310(e)(2)(iv) of the final action), and the NS1 guidelines set a high standard for respecification of SDC due to environmental change. The Council must utilize the best available science, provide adequate rationale, and provide a basis for measuring the status of the stock against these criteria, and the SDC must be consistent with § 600.310(e)(2)(iii) of the final action. If manmade environmental changes are partially responsible for the overfished condition, the Council should recommend restoration of habitat and ameliorative programs in addition to curtailing fishing mortality.

Comment 31: NMFS received several comments that state that by requiring reference points to be point estimates NMFS is not acknowledging the uncertainty inherent in fishery management science. The comments expressed that the best way to incorporate uncertainty was to express SDCs as ranges and not point estimates.

Response: NMFS believes that uncertainty in SDC, OFL, and other fishing level quantities is best dealt with by fully analyzing the probability that overfishing will occur and that the stock might decline into an overfished condition, but we recognize that such a full analysis is not possible in many data-limited situations. When using a probability based approach, the distribution of probabilities includes a point estimate and it extends along a range. A probability based approach is already used in many rebuilding plans, for example, what fishing level will provide at least a 70% chance that the stock will be rebuilt in 10 years. NMFS scientists are working on a technical document that will describe some of the currently available methods to do such calculations, as well as some proxy approaches that could be used in situations where available data and methods do not allow calculation of the probability distributions.

Comment 32: NMFS received a number of comments regarding the proposed description of the relationship between ACT and OY—that achieving the ACT on an annual basis would, over time, equate to the OY. Comments requested more clarification, or did not agree with the described ACT–OY relationship.

Response: NMFS has revised the final action to remove the requirement that ACT be established, and instead discussed how targets, including ACT, function within the system of AMs to prevent the ACL from being exceeded. NMFS has also removed the discussion about the relationship of ACT to OY, based on the comments received. The full range of conservation and management measures for a fishery, which include the ACL and AM provisions, are required to achieve the OY for the fishery on a continuing basis. NMFS interprets the phrase ''achieving, on a continuing basis, the optimum yield for each fishery'' to mean producing from each stock or stock complex or fishery a long-term series of catches such that the average catch is equal to OY, overfishing is prevented, the long-term average biomass is near or above B_{msy}, and overfished stocks and stock complexes are rebuilt consistent with timing and other requirements of section 304(e)(4) of the MSA and § 600.310(j) of the final NS1 guidelines. NMFS notes that for fisheries where stock abundance is below the level that can produce the OY without the fishing mortality rate exceeding the MFMT, the annual yield will be less than the long-term OY level. In the case of an overfished fishery, ''optimum'' with respect to yield from a fishery means providing for rebuilding to a level consistent with producing the MSY in such fishery. When stock abundance is above B_{msy}, a constant fishing mortality control rule may allow the annual catch to exceed the long-term average OY without overfishing occurring, but frequent stock assessments need to be conducted to update the level of stock abundance.

Comment 33: One commenter stated that ''OY equates with the acceptable biological catch (''ABC''), which in turn is the level at which ACL should be set.'' Another commenter stated that, in specifying ACLs, a Council should not exceed MSY, because MSY—as opposed to ABC—is the ''fishing level recommendation'' that should not be exceeded per MSA 302(h)(6).

Response: MSA includes the terms ''fishing level recommendations,'' ''acceptable biological catch,'' and ''annual catch limits'' but does not define them. As such, NMFS has considered how to interpret these provisions in light of the statutory text and taking into consideration public comment during scoping and in response to the proposed NS1 guidelines. NMFS believes that ABC refers to a level of ''catch'' that is ''acceptable'' given the ''biological'' characteristics of the stock or stock complex. As such, OY does not equate with ABC. The specification of OY is required to consider a variety of factors, including social and economic factors, and the protection of marine ecosystems, which are not part of the ABC concept. The Councils determine the ACL, which may not exceed the fishing level recommendations of its science advisors. Of the several required SSC recommendations (MSA 302(g)(1)(B)), the ABC is most directly applicable as the constraint on the Council's ACL. Although MSY and ABC are both derived from a control rule, the ABC is the appropriate constraint on ACL because it is the annualized result of applying that control rule (thus is responsive to current stock abundance) whereas the MSY is the expected long-term average from a control rule. The Council should generally set the ACL lower than the ABC to take into account other factors related to preventing overfishing or achieving OY, or it may set the ACL equal to the ABC and take these additional factors into account when setting an ACT below the ACL.

Comment 34: Several commenters stated that NMFS's definition

framework for ACLs contains buffers that are not required by the Magnuson-Stevens Act and reduce or prevent the likelihood that OY can be achieved for a stock (Reducing a stock's OFL for scientific and management uncertainty, and OY factors results in too many reductions and makes it too difficult to achieve OY).

Response: NMFS believes that fisheries managers cannot consistently meet the requirements of the MSA to prevent overfishing and achieve, on a continuing basis, OY unless they address scientific and management uncertainty. The reductions in fishing levels that may be necessary in order to prevent overfishing should be only the amount necessary to achieve the results mandated by the MSA. Properly applied, the system described in the guidelines does not result in ''too many deductions,'' but rather, sets forth an approach that will prevent overfishing, achieve on a continuing basis OY, and incorporate sufficient flexibility so that the guidelines can be applied in different fisheries.

Comment 35: Several commenters suggested that NMFS clarify language to ensure that all aspects of fishing mortality (e.g., dead discards and post-release mortality) are accounted for in the estimates of ABC or when setting the ACL, and that all catch is counted against OY. NMFS also received comments that accounting for bycatch mortality in data poor situations should not be required.

Response: NMFS agrees that all sources of fishing mortality, including dead discards and post-release mortality from recreational fisheries must be accounted for, but believes that language in § 600.310(e)(3)(v)(C), (f)(2)(i) and (f)(3)(i) in both the proposed and final action sufficiently explains that catch includes fish that are retained for any purposes, mortality of fish that have been discarded, allocations for scientific research, and mortality from any other fishing activity. NMFS, however, disagrees that, when bycatch data is lacking, managers could ignore this known source of fishing mortality. Ignoring a known source of fishing mortality because data are lacking leads to underestimating catch. Unless this is factored in—for instance, as increased uncertainty leading to more conservative ABC and appropriate AMs (including ACT control rules)—overfishing could occur. NMFS's National Bycatch Report (due to be published in late 2008 or early 2009) provides comprehensive estimates of bycatch of fish, marine mammals, and non-marine mammal protected resources in major U.S. commercial fisheries. For instances where the National Bycatch Report does not provide bycatch data, NMFS suggests developing proxies based on National Bycatch Report bycatch ratios in similar fisheries until better data are available. For more information on the National Bycatch Report, *see http://www.st.nmfs.noaa.gov/st4/nop/Outreach/NBR_Factsheet_Final.pdf*. However, the decision about the best methodology for estimating bycatch should be made by the Council in consultation with its SSC, considering the best available scientific information.

Comment 36: One commenter requested clearer guidance for the specification of ABC and ultimately an ACL in cases where scientific uncertainty ''overwhelms'' the SSC's ability to make a valid ABC recommendation.

Response: The NS1 Guidelines recognize that precise quantitative assessments are not available for all stocks and some stocks do not have sufficient data for any assessment beyond an accounting of historical catch. It remains important to prevent overfishing in these situations, even though the exact level of catch that causes overfishing is not known. The overall guidance is that when stocks have limited information about their potential yield, harvest rates need to be moderated until such information can be obtained. Possible approaches include setting the ABC as 75% of recent average catch; see NMFS' Technical Guidance in Restrepo *et al.* (1998). NMFS is currently working on a report on control rules that will provide additional examples of possible approaches for data-limited situations as well as approaches that can use a better set of information.

Comment 37: ABC and ACT control rules should be revised to require consideration of life history characteristics (e.g., productivity, geographic range, habitat preferences, etc.) of a stock when setting control rules or catch limits.

Response: NMFS agrees that the productivity of stock, as well as the stocks susceptibility to the fishery should be considered when developing the ABC control rule. NMFS refers to these factors together as the vulnerability of stock, which is defined in § 600.310(d)(10) of the final action. The ABC control rule (see § 600.310(f)(4) of the final action) is based on scientific knowledge about the stock, which includes a stock's vulnerability to the fishery.

Regarding the ACT control rule, the final guidelines do not require that ACTs always be established, but provide that ACTs may be used as part of a system of AMs. When used, ACT control rules address management uncertainty, which is not related to the productivity of the stock. As noted in § 600.310(g)(3) of the final action, however, a Council could choose a higher performance standard (e.g., a stock's catch should not exceed its ACL more often than once every five or six years) for a stock that is particularly vulnerable to the effects of overfishing. In considering the performance standard, a Council should consider if the vulnerability of the stock has been accounted for in the ABC control rule, so as not to double count this type of uncertainty and provide unduly cautious management advice.

Comment 38: NMFS received comments requesting that text in § 600.310(f) of the proposed action be modified to clarify that ABC may not equal or exceed OFL; Councils are required to establish ABC control rules; the ABC and ACT control rules must stipulate the stock level at which fishing will be prohibited; and ACL cannot equal or exceed the ABC.

Response: NMFS does not agree that the guidelines should prohibit ABC from being equal to OFL, or ACL from being equal to ABC. NMFS has added text to the guidelines (§ 600.310(f)(3) and (f)(4)) to clarify that it believes that ABC should be reduced from OFL in most cases, and that if a Council recommends an ACL which equals ABC, and the ABC is equal to OFL, the Secretary may presume that the proposal would not prevent overfishing, in the absence of sufficient analysis and justification for the approach. NMFS agrees that an ABC control rule is required. NMFS does not agree, however, that the ABC and ACT control rules must stipulate the level at which fishing is prohibited. Here it is important to distinguish between setting an annual level of catch equal to zero because the stock biomass is low, from prohibiting landings for the remainder of a fishing year because the ACL has already been achieved. For the first type of prohibition, an ABC control rule could stipulate the level at which fishing is prohibited due to low stock biomass, but such a low level of biomass is likely to be below the MSST which will invoke development of a rebuilding plan with associated modification of the ABC control rule for the duration of the plan. NMFS, however, disagrees that the ACT control rule should have a similar stipulation as the primary function of this control rule is to account for management uncertainty and to serve as the target for inseason management actions.

Comment 39: NMFS received several comments that spatial-temporal management of ACLs should be employed as an integral part of effective catch-limit management. The commenters noted that apportioning ACLs by seasons and areas could reduce bycatch, protect sensitive habitats, reduce competition among fishery sectors, avoid localized and serial depletions of stocks, and ensure geographic and seasonal availability of prey to key predators.

Response: NMFS acknowleges that spatial and temporal considerations of fishery removals from a stock can be important. Many fisheries currently incorporate spatial and temporal considerations. However, in the context of NS1, these considerations would be relevant only if the overfishing definition or the OY definition for a stock included spatial or temporal divisions of the stock structure. NMFS believes the guidelines give Councils flexibility to consider spatial and temporal issues in establishing ACLs for a stock, and does not agree that the NS1 guidelines need to specifically address this issue. Apportioning ACLs by seasons and areas could be considered as Councils develop conservation and management measures for a fishery to meet the full range of MSA requirements, including the NS for basing conservation and management measures upon the best scientific information available (NS2); taking into account the importance of fishery resources to fishing communities to provide sustained participation and minimize adverse economic impacts (NS8); minimizing bycatch (NS9); and allocating fishing privileges among various U.S. fishermen that are fair and equitable, reasonably calculated, and carried out in such a manner that no particular entity acquires an excessive share of the catch (NS4).

Comment 40: NMFS received several comments about the role of the SSC in specifying ABC. Several commenters stated that the final ABC recommendation should be provided by the SSC (i.e., final peer review process), rather than an additional peer review process. Some commenters expressed concern that both the SSC and peer review process would recommend an ABC, leaving the Council to use the lower of the two recommended ABC values. One comment stated that the SSC should have the discretion to recommend an ABC that is different from the result of the control rule calculation in cases where there was substantial uncertainty or concern relating to the control rule calculated ABC.

Response: NMFS agrees that the SSC should provide the final ABC recommendation to their Council. In the preamble of the proposed NS1 revisions, NMFS acknowledged that the statutory language could be subject to different interpretations (*see* p. 32532 of 73 FR 32526; June 9, 2008). MSA refers to not exceeding fishing level recommendations of ''scientific and statistical committee or peer review process'' in one place and SSC recommendations for ABC and MSY in another place. Compare MSA sections 302(h)(6) and 302(g)(1)(B). Section 302(g)(1)(E) of the MSA provides that the Secretary and a Council may, but are not required to, establish a peer review process. NMFS feels that the Council should not receive ABC recommendations from two different sources (SSC and peer review). In order to avoid confusion, and in consideration of the increased role of SSCs in the MSA, NMFS believes that the SSC should provide the ABC recommendation and Councils should establish a clear process for receiving the ABC recommendation (as described in § 600.310(f)(3) of this action). The advance notice of proposed rulemaking (ANPR) (73 FR 54132; September 18, 2008) for potential revision of the National Standard 2 Guidelines includes consideration of the relationship between SSCs and peer review processes. NMFS believes the roles of the peer review process and the SSC complement each other. For example, a peer review process may conduct an extensive technical review of the details of each stock assessment. The SSC can then use the assessment document and its peer review, consider unresolved uncertainties, seek consistency with assessment decisions made for other stocks in the region, and arrive at an ABC recommendation. In addition, NMFS agrees that SSCs could provide an ABC recommendation that differed from the result of the ABC control rule calculation based on the full range of scientific information available to the SSC. The SSC would have explain why the recommendation differed from the calculated value. NMFS has added clarifying language into § 600.310(f)(3) of this action.

Comment 41: NMFS received a variety of comments on the role of the SSC and suggestions that the SSC role should be clarified. Comments included: There should be a mandatory peer review of significant SSC recommendations; the SSC should be directed to draw information and recommendations from the broadest possible range of scientific opinion; the SSC recommendation should include a discussion of alternative recommendations that were considered and alternative methodologies that were explored; what is the role of the SSC in providing recommendations for achieving rebuilding targets?; what is the SSC's role in providing ''reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices''?; the rule should clarify that the SSC is not charged with actually collecting the data and writing reports; the guidelines should specify the appropriate qualifications and membership of the SSCs and peer review process; the guidelines should specify the relative roles of the SSCs, peer review process, and Councils in establishing ACLs; the guidelines should specify the relative roles of NMFS, the Councils, the SSCs and the peer review process in selecting and evaluating AMs; NMFS should establish formal criteria for SSC membership, including formal training and/or experience in fisheries and/or ecological science or economics; NMFS should create oversight mechanisms and responsibility within NMFS to ensure that members are both qualified and acting in the public interest rather than representing stakeholders; NMFS should provide adequate training programs so that new members are well-prepared to meet these challenges; and NMFS should provide a mechanism for SSC members to identify and challenge political interventions, including potentially the development of a new scientific appeal function, staffed by a board of objective, external expert scientists.

Response: In developing the NS1 guidelines, NMFS focused on the SSC recommendation of the ABC as it is an important reference point for the Councils to use when developing ACLs. NMFS feels that the NS1 guidelines as proposed are clear in that the SSC provides the ABC recommendation and the Councils establish the ACLs. Both the ABC control rules and the ACT control rules could be developed with input from the SSC, Council, and peer review process as appropriate. NMFS believes that the NS1 guidelines adequately address the requirements for SSC recommendations that pertain to NS1. NMFS believes that other specific roles of the SSC would be more appropriately addressed in the National Standard 2 (NS2) guidelines.

Comment 42: Some commenters supported the proposed guidelines regarding the SSC, its relation to the Council, and provision of science advice such as ABC, but requested that the

guidelines further emphasize that managers follow the advice of their scientific advisors in all cases when setting catch limits. Other commenters opposed the provisions and stated that accounting for scientific uncertainty is a matter of policy, not science and therefore should be delegated to the Council. Instead, the commenters proposed that the SSC should be recommending the OFL and that the Council may not set an ACL in excess of the OFL as determined by the SSC.

Response: NMFS believes that determining the level of scientific uncertainty is not a matter of policy and is a technical matter best determined by stock assessment scientists as reviewed by peer review processes and SSCs. Determining the acceptable level of risk of overfishing that results from scientific uncertainty is the policy issue. The SSC must recommend an ABC to the Council after the Council advises the SSC what would be the acceptable probability that a catch equal to the ABC would result in overfishing. This risk policy is part of the required ABC control rule. The Council should use the advice of its science advisors in developing this control rule and should articulate the control rule in the FMP. In providing guidance on establishing a control rule for the ABC, NMFS recognizes that all estimates of the OFL are uncertain, and that in order to prevent overfishing with more than a 50 percent probability of success, the ABC must be reduced from the OFL. The guidance is clear that the control rule policy on the degree of reduction appropriate for a particular stock is established by the Council. To the extent that it results in the ABC being reduced from the OFL, the SSC is carrying out the policy established by the Council. NMFS disagrees that the SSC should recommend OFL and not ABC. The MSA specifies a number of things that make up the recommendations that SSCs provide to their Council including recommendations for ABC, preventing overfishing, MSY, achieving rebuilding targets, reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures, and sustainability of fishing practices. Of these, the ABC is directly relevant as the fishing level recommendation that constrains the ACL.

Comment 43: One comment expressed that Councils must be allowed to specify information needed in the SAFE report.

Response: NMFS agrees. NMFS has removed the following sentence from § 600.310(b)(2)(v)(B) of the final action: ''The SSC may specify the type of information that should be included in the Stock Assessment and Fishery Evaluation (SAFE) report (see § 600.315).''

The contents of the SAFE report fall under the purview of the National Standard 2 (NS2) guidelines. NMFS is currently considering revising the NS2 guidelines, including modification of the language describing the content and purpose of SAFE reports. NMFS recently published an advance notice of proposed rulemaking (73 FR 54132; September 18, 2008) to revise the NS2 guidelines and encourages the public to provide comment.

Comment 44: One commenter believed the ACT should be a suggested component of a fishery management plan rather than a mandated component of an FMP. Although the ACT may clearly distinguish management uncertainty from other sources of uncertainty, adding a target does not fundamentally improve the process. It is more important to correctly adjust the ACL based on actual performance data than to create a separate target or ACT control rule based on theory to account solely for management uncertainty.

Response: The final guidelines do not require that ACTs always be established, but provide that ACTs may be used as part of a system of AMs. NMFS disagrees that a target does not fundamentally improve the process. ACL is to be treated as a limit—an amount of catch that the fishery should not exceed. The purpose of utilizing an ACT is so that, given uncertainty in the amount of catch that will result from the conservation and management measures in the fishery, the ACL will not be exceeded. Whether or not an ACT is explicitly specified, the AMs must address the management uncertainty in the fishery in order to avoid exceeding the ACL. ACLs are subject to modification by AMs.

Comment 45: One comment stated that the purpose of an ACT is to address ''management uncertainty'' which seems to be a very abstract and unquantifiable concept that the Councils are likely to struggle with.

Response: NMFS disagrees that management uncertainty is an abstract concept. It relates to the difference between the actual catch and the amount of catch that was expected to result from the management measures applied to a fishery. It can be caused by untimely catch data that usually prevents inseason management measures from being effective. Management uncertainty also results from underreporting, late reporting and misreporting and inaccurate assumptions about discard mortality of a stock in commercial and recreational fisheries. One way to estimate management uncertainty is to examine a set of annual actual catches compared to target catches or catch quotas for a stock. If all or most of the catches fall closely around their target catches and don't exceed the OFL then management uncertainty is low; if actual catches often or usually result in overfishing then the management uncertainty is high and should be accounted for when establishing the AMs for a fishery, which may include setting an ACT.

Comment 46: NMFS received several comments regarding scientific and management uncertainty. In general these comments included: Clarify the meaning of scientific uncertainty; clarify that some types of uncertainty may not be considered in the ABC control rule process; increase research efforts in order to deal with scientific uncertainty; provide flexibility in the guidelines regarding how the Councils deal with uncertainty; and recognize that recreational fisheries are unduly impacted by the guidelines due to delayed monitoring of catch.

Response: Scientific uncertainty occurs in estimates of OFL because of uncertainty in calculations of MFMT, projected biomass amounts, and estimates in F (i.e., confidence intervals around those parameter estimates). In addition, retrospective patterns in estimates of future stock biomass and F (i.e., biomass may be overestimated and F underestimated on a regular basis) occur in some stock assessments and should be accounted for in determining ABC. NMFS revised the guidelines to make clear that all sources of scientific uncertainty—not just uncertainty in the level of the OFL—must be considered in establishing the ABC, and that SSCs may incorporate consideration of uncertainty beyond that specifically accounted for in the ABC control rule, when making their ABC recommendation. Management uncertainty should be considered primarily in establishing the ACL and AMs, which could include ACTs, rather than in specification of the ABC.

Comment 47: The definition of ABC in § 600.310(f)(2)(ii) of the proposed rule provides that ABC is a level of catch ''that accounts for scientific uncertainty in the estimate of OFL'' and is specified based on the ABC control rule. Scientific uncertainty is not and should not be limited to the estimate of OFL. That restriction would make it more difficult to implement other appropriate methods for incorporating scientific uncertainty in other quantities such as distribution of long term yield.

Response: NMFS agrees. NMFS has revised §§ 600.310(f)(2)(ii), (f)(2)(iii),

and (f)(4) of the action to state that ABC accounts for scientific uncertainty in the estimate of OFL and other scientific uncertainty.

Comment 48: Several commenters stated that buffers, or margins of safety, need to be required between the overfishing level and annual catch limits to account for uncertainty, and that the final action should require the use of such buffers to achieve a high probability that overfishing does not occur. NMFS received comments suggesting that buffers between limit and target fishing levels reduce the chance that overfishing will occur and should be recognized as an accountability measure. Other commenters thought that the provision for setting ACT less than ACL meant that a Council has no discretion but to establish buffers. They said that while buffers may be appropriate in certain circumstances, they may also prevent achievement of OY in some circumstances.

Response: As noted elsewhere, NMFS has revised the final guidelines: they do not require that ACTs always be established, but provide that ACTs may be used as part of a system of AMs. The guidelines are intended only to provide Councils with direction on how the requirements of NS1 can be met, incorporating the requirement for ACLs and AMs such that overfishing does not occur. To prevent overfishing, Councils must address scientific and management uncertainty in establishing ABC, ACLs, and AMs. In most cases, some reduction in the target catch below the limit will result. NMFS does not believe that requiring buffers is appropriate, as there may be circumstances where that is not necessary to prevent overfishing. However, the guidelines require that AMs in a fishery be adequate to prevent ACLs from being exceeded, and that additional AMs are invoked if ACL is exceeded.

Comment 49: Some commenters stated that Councils needed flexibility to effectively tailor fishery management plans to the unique conditions of their fisheries, and that Councils should also have flexibility in how to account for scientific and management uncertainty.

Response: NMFS agrees that Councils should have flexibility, so long as they meet the requirements of the statute. ACLs to prevent overfishing are required, and management and scientific uncertainty must be considered and addressed in the management system in order to achieve that objective. NMFS also believes that Councils should be as transparent and explicit as possible in how uncertainty is determined and addressed, and believes the guidelines provide a good framework to meet these objectives.

Comment 50: One commenter supported NMFS' attention to scientific and management uncertainty, but thought that the better approach to deal with uncertainty is to reduce uncertainty. They stated that to accomplish this objective NMFS must increase its support for agency scientific research specific to stock assessments and ecosystem science.

Response: NMFS agrees. However, the processes proposed in the guidelines will address the current levels of uncertainty and accommodate reduced uncertainty in the future, as improvements in data are made.

Comment 51: Some commenters said that implementing ACLs would lead to economic disruption, particularly in the recreational fishing sector, because of a large degree of management uncertainty. One commenter cited difficulties in obtaining timely and accurate data, particularly for recreational fisheries, and asked if recreational allocations would have to be reduced due to delays in obtaining recreational harvest estimates.

Response: Preventing overfishing is a requirement of the MSA. The ACL mechanisms and AMs for a fishery must be adequate to meet that requirement, and in some cases, reductions in catch levels and economic benefits from a fishery may result. The specific impacts of implementing ACLs in a fishery will be analyzed when the ACLs are established in an FMP.

Comment 52: One commenter stated that the guidelines would require reducing catches well below existing OY levels, and that many species are known to be fished at low levels which are highly unlikely to lead to overfishing. They stated that this is inconsistent with responsible marine management and seems unlikely to represent the intent of Congress.

Response: Nothing in the guidelines would require a reduction in fishing if, in fact, the stocks are fished at low levels which are highly unlikely to lead to overfishing, and this conclusion is supported by science.

Comment 53: One commenter asked if OY could be specified for a fishery or a complex, or if the guidelines would require specification of OY for each species or complex.

Response: The guidelines provide that OY can be specified at the stock, stock complex or fishery level.

Comment 54: NMFS received several comments both supporting and opposing the use of inseason AMs (§ 600.310(g) of the proposed action). The commenters that supported the use of inseason AMs typically suggested that the Councils and NMFS improve their capability to use inseason AMs and/or that NMFS must make inseason closure authority a required element of FMPs. Opponents of inseason AMs commented that it is more reasonable to implement AMs after reviewing annual fishery performance data; there is no requirement in the law to impose inseason measures; inseason closures without individual transferable quotas will generate derby fisheries; and the requirement to use inseason AMs whenever possible would be difficult where monitoring data is not available.

Response: MSA provides for ACLs to be limits on annual catch, thus it is fully appropriate and consistent with the Act that available data be utilized to prevent ACLs from being exceeded. Conservation and management measures for a fishery should be designed so that ACLs are not routinely exceeded. Therefore, FMPs should contain inseason closure authority giving NMFS the ability to close fisheries if it determines, based on data that it deems sufficiently reliable, that an ACL has been exceeded or is projected to be reached, and that closure of the fishery is necessary to prevent overfishing. NMFS believes that the alternative result, which is that data are available inseason that show an ACL is being exceeded, but no management action is taken to prevent overfishing, would not meet the intent of the MSA. The MSA requires ACLs in all fisheries. It does not provide an exemption based on a concern about derby fishing. NMFS has modified the language in § 600.310(g)(2) of this action to indicate that ''For fisheries without inseason management control to prevent the ACL from being exceeded, AMs should utilize ACTs that are set below ACLs so that catches do not exceed the ACL.''

Comment 55: NMFS received some comments that generally expressed that AMs will be difficult to implement and that the provisions need to be clarified. Comments included: if an ACL is exceeded, a review by the Council must occur before implementation of the AMs; the Council must examine the ''problem'' that caused the overage—which means nothing will happen quickly; and it is not clear what ''biological consequences'' means in § 600.310(g)(3) of the proposed action.

Response: As proposed, AMs are management measures designed to prevent an ACL from being exceeded, as well as measures to address an overage of an ACL if it does occur. NMFS recommends that, whenever possible, Councils implement AMs that allow inseason monitoring and adjustment of

the fishery. The AMs should consider the amount of time required for a Council to conduct analyses and develop new measures. In general, AMs need to be pre-planned so they can be effective/available in the subsequent year, otherwise, there could be considerable delay from the time that an overage occurs to the time when measures are developed to address the overage. Not all overages may warrant the same management response. Consider hypothetically the example of a fishery for which a 3 fish bag limit with 16 inch minimum size is expected to achieve the target catch level without exceeding the ACL. For such a fishery, the Council might implement AMs such that, if the catch was under the ACL or exceeded it by less than 5 percent, the same bag and size limits would apply the following year. If the ACL was exceeded by 5–25 percent, the bag limit the following year would be reduced to 2 fish, and if the ACL was exceeded by more than 25 percent the bag limit would be reduced to 1 fish. The AMs could also address a situation where catch was below the target level, indicating that the initial measures might be too strict. The objective is to have pre-planned management responses to ACL overages that will be implemented in the next season, so that flawed management measures do not result in continuing overages for years while Councils consider management changes. An FMP must contain AMs (see § 600.310(c)(5) of the final action). However, NMFS believes that the FMP could contain more general framework measures and that specific measures, such as those described hypothetically above, could be implemented through harvest specifications or another rulemaking process.

By ''biological consequences,'' NMFS means the impact on the stock's status, such as its ability to produce MSY or achieve rebuilding goals. For example, if information was available to indicate that, because of stronger than expected recruitment, a stock was above its B_{msy} level and continued to grow, even though the ACL was exceeded for the year, that could indicate that the overage did not have any adverse biological consequences that needed to be addressed through the AM. On the other hand, if the ACL for a long lived stock with low reproductive potential was exceeded by 100 percent, AMs should be responsive to the likelihood that some long-term harm to the stock may have been caused by the overage.

Comment 56: One commenter expressed concern about the term ''re-evaluated'' in §§ 600.310(g)(3) and (g)(4) in the proposed action. They stated that this could imply that Councils simply have to increase ACLs when they have ACL exceedances, and suggested that, if catch exceeds ACL more than once in last four years, there should be automatic buffer increases in setting ACL below OFL to decrease likelihood of exceeding ACL.

Response: If the performance standard is not met, the Councils must re-evaluate the system of ACLs and AMs, and modify it if necessary so that the performance standard is met. Since the ACL cannot exceed the ABC recommended by the SSC, NMFS does not believe that the scenario described by the commenter would arise. NMFS also does not believe that the guidelines should recommend automatic buffer increases in this case. The specific factors that caused the performance standard to not be met need to be analyzed and addressed. NMFS also notes that, in addition to this re-evaluation of the system of ACLs and AMs, AMs themselves are supposed to prevent and address ACL overages.

Comment 57: Several comments were received related to accountability measures for when catch exceeds the ACL. Some comments supported the concept that a full payback of ACL overages should be required for all stocks. Comments included: Overage deductions should be normal business for rebuilding and healthy stocks alike; NMFS should require all overages to be accounted for in full for all managed fisheries no later than when the ACL for the following fishing year is determined; and overage deductions must be viewed as an independent requirement from actions geared to preventing overages from occurring in the future, such as modifications of management measures or changes to the full system of ACLs, ACTs, and AMs.

Response: MSRA is silent with regard to mandatory payback of ACL overages. However, in developing the ACL provisions in the MSRA, it appears that Congress considered mandatory paybacks and did not include that requirement in the MSRA. NMFS believes that paybacks may be an appropriate AM in some fisheries, but that they should not be mandated, but rather considered on a case by case basis for stocks and stock complexes that are not in a rebuilding plan.

Comment 58: Several comments opposed the concept of an overage adjustment when catch exceeds the ACL for stocks that are in rebuilding plans (§ 600.310(g)(3) of the proposed action). Comments included: The MSA does not require this, this provision was removed from the drafts of the MSRA, and a full ''payback'' the following year may be unnecessary. Other comments supported the concept but wanted to strengthen § 600.310(g)(3) of the guidelines to remove text that stated: ''unless the best scientific information available shows that a reduced overage adjustment, or no adjustment, is needed to mitigate the effects of the overages.''

Response: NMFS believes that more stringent requirements for AMs are necessary for stocks in rebuilding plans. MSA 304(e)(3) provides that, for overfished stocks, an FMP, FMP amendment, or proposed regulations are needed to end overfishing immediately in the fishery and rebuild overfished stocks. There are a number of examples where failure to constrain catch to planned levels early in a rebuilding plan has led to failure to rebuild and the imposition of severe catch restrictions in later years in order to attempt to meet the required rebuilding timeframe. Thus, for rebuilding stocks, NMFS believes that an AM which reduces a subsequent year's ACL by the amount of any overage is appropriate, and will help prevent stocks failing to rebuild due to annual rebuilding targets being exceeded. NMFS does provide that if there is an analysis to show that all or part of the deduction is not necessary in order to keep the stock on its rebuilding trajectory, the full overage payback is not necessary. For example, an updated stock assessment might show that the stock size has increased faster than expected, in spite of the overage, and that a deduction from the subsequent ACL was not needed. For most rebuilding stocks, assessments cannot be updated annually, and in the absence of such analytical information, NMFS believes that the guideline provision is necessary to achieve rebuilding goals for overfished stocks.

Comment 59: Some commenters expressed support for the AMs as proposed and agreed that AMs should prevent catch from exceeding the ACL and address overages if they should occur. Other commenters suggested that AMs should be tied to overfishing or that AMs should be triggered when catch exceeds the ABC (as opposed to the ACL). Some commenters expressed that the MSA does not require the application of AMs if the ACL is exceeded.

Response: In developing the guidelines, NMFS considered using OFL or ABC as a point at which mandatory AMs should be triggered. However, NMFS believes that Congress intended the ACL to be a limit, and as such, it should not be exceeded. In addition, ''measures to ensure accountability'' are required in association with the ACL in MSA section 303(a)(15). Therefore, it is

most appropriate to apply AMs if the ACL is exceeded. In addition, the purpose of ACLs is to prevent overfishing, and AMs triggered at the ACL level should be designed so that the ABC and OFL are not exceeded.

Comment 60: Several comments were received regarding the proposed performance standards. The performance standard that NMFS proposed in the proposed action stated that: ''If catch exceeds the ACL more than once in the last four years, the system of ACLs, ACTs and AMs should be re-evaluated to improve its performance and effectiveness.'' In cases where AMs are based on multi-year average data, the proposed performance standard stated: ''If average catch exceeds the average ACL more than once in the last four years, then the ACL, ACT and AM system should be re-evaluated.'' The commenters that supported the proposed performance standard suggested that it would allow the Council more flexibility in the management of their fisheries with ACLs. Commenters that disliked the proposed performance standard suggested that the Councils should have more flexibility in determining the performance standards, expressed concerns that the performance standard may not be precautionary enough, or expressed that it was arbitrary.

Response: NMFS believes it is important to establish a performance standard to establish accountability for how well the ACL mechanisms and AMs are working that is consistent across all Councils and fisheries. NMFS believes that ACLs are designed to prevent overfishing and that it is important to prevent catches from exceeding ACLs. NMFS also believes that, given scientific and management uncertainty, it is possible that catch will occasionally exceed ACL for a given stock or stock complex. However, it would be unacceptable to allow catch to continually exceed ACL. Therefore, NMFS proposed the performance standard to allow for some flexibility in the management system but also prevent overfishing. It should not limit a Council from establishing stronger performance measures, or from reevaluating their management measures more often. Notwithstanding the performance standard, if, at any time, a Council determines that the conservation and management measures for a fishery are not achieving OY while preventing overfishing, it should revise the measures as appropriate.

Comment 61: Several comments were received that suggested that fishery managers should or be required to re-evaluate the system of ACLs, ACT and AMs every time catch exceeds ACL. In addition, some expressed that NMFS should make clear that the ''reevaluation'' called for in the proposed action does not authorize simply raising ACLs or other numeric fishing restrictions in order to avoid the inconvenient fact that they have been exceeded.

Response: NMFS does not agree that a re-evaluation of the entire system of ACLs and AMs should be required every time an ACL is exceeded. If catch exceeds ACL in any one year, or if the average catch exceeds the average ACL, then AMs will be implemented and they should correct the operational issues that caused the overage, as well as any biological consequences resulting from the overage. Councils should be allowed the opportunity to see if their AMs work to prevent future overages of the ACL.

Comment 62: NMFS received comments that requested clarification or changes to the proposed performance standard. For example, one commenter suggested that NMFS should require a higher performance standard for vulnerable stocks. Two commenters expressed that the performance standard should apply at the stock or stock complex level as opposed to the fishery or FMP level. Another commenter questioned if the performance standard was if catch exceeds the ACL more than once in the last four years or if average catch exceeds the average ACL more than once in the last four years. NMFS also received some comments about the phrase ''to improve its performance and effectiveness'' in paragraph § 600.310(g)(3) of the proposed action. Those comments included: The phrase does not make sense in this context, because simply re-evaluating a system cannot improve its performance or effectiveness (only changing a system can do so); and use of this phrase in § 600.310(g)(3) is inconsistent with a similar sentence in paragraph § 600.310(g)(4) of the proposed action, where the same requirement is expressed, but this phrase does not appear.

Response: NMFS stated in the preamble of the proposed guidelines that a Council could choose a higher performance standard for a stock that is particularly vulnerable to the effects of overfishing. While NMFS agrees that a higher performance standard could be used for a stock or stock complex that is particularly vulnerable, NMFS believes the discretion to use a higher performance standard should be left to the Council. To reiterate this point, NMFS is adding additional language in § 600.310(g)(3) of the final action. NMFS intended that the performance standards would apply at the stock or stock complex level and is adding additional clarifying language in the regulatory text. The National Standard 1 guidelines as proposed offered two performance standards, one applies when annual catch is compared to the ACL for a given stock or stock complex, as described in paragraph § 600.310(g)(3) of this action, the other performance standard applies in instances when the multi-year average catch is compared to the average ACL, as described in § 600.310(g)(4) of this action. NMFS intended that in both scenarios, if the catch exceeds the ACL more than once in the last four years, or if the average catch exceeds the average ACL more than once in the last four years, then the system of ACLs and AMs should be re-evaluated and modified if necessary to improve its performance and effectiveness. NMFS has modified language to § 600.310(g)(3) and (4) of this action to clarify this issue.

Comment 63: NMFS received several suggestions to require a specific and high probability of success in either preventing overfishing, preventing catch from exceeding the ACL, or achieving the ACT. Comments included: The rule should make clear that management measures must have a high probability of success in achieving the OY or ACT; we recommend a probability of at least eighty percent of achieving the OY or ACT; NMFS should establish a performance standard that defines low risk, as well as an acceptable probability of successfully managing catch levels of 90 percent; National Standard guidelines should explicitly define the maximum acceptable risk of overfishing. One commenter cited to several court cases (NRDC v. Daley, Fishermen's Dock Coop., and Coastal Conservation Ass'n) and stated that the ACT control rule should be revised to state that the risk of exceeding the ACL due to management uncertainty is no greater than 25 percent.

Response: Considering and making appropriate allowances for uncertainty in science and management is emphasized in the NS1 guidelines. NMFS believes that, if this is done, ACLs will not often be exceeded, and when they are, the overages will typically be small and will not jeopardize the status of the stock. Fisheries where ACLs are exceeded regularly or by large amounts should be quickly modified to improve the measures.

During the initial scoping period, NMFS received many comments on the topic of setting a specific probability of success; some commenters expressed that a 50 percent probability of success is all that is legally required, while other

commenters expressed that the probability of success should be higher (e.g. 75 or 100 percent). When developing the definition framework of OFL, ABC, ACL, and ACT, NMFS considered including specific probabilities of success regarding preventing overfishing or preventing catch from exceeding ACL. NMFS did not specify a particular probability in the NS1 guidelines, for a number of reasons. NMFS did not believe it had a basis for picking a specific probability number that would be appropriate for all stocks and stock complexes in a fishery. Councils should analyze a range of alternatives for the probability that ACL will not be exceeded or that overfishing will not occur. NMFS recognizes that fisheries are different and that the biological, social and economic impacts of managing at a specific probability will differ depending on the characteristics of the fishery. NMFS also recognizes that it is not possible to calculate a probability of success in many fisheries, due to data limitations.

NMFS does not believe that MSA and relevant case law require use of specific probabilities. However, a 50 percent probability of success is a lower bound, and NMFS believes it should not simply be used as a default value. Therefore, in § 600.310(f)(4) of the final action, NMFS states that the determination of ABC should be based, when possible, on the probability that catch equal to the stock's ABC would result in overfishing, and that this probability cannot exceed 50 percent and should be a lower value.

To determine if the system of ACLs was working adequately, NMFS decided to establish a performance standard in terms of the frequency that ACLs were exceeded. The comparison of catch to an ACL is a simpler task than calculating a probability of success, and can be applied to all fisheries, albeit some fisheries have more timely catch data than others. This does not preclude the Councils from using the probability based approach to setting limits and targets in their fisheries if they are able to do so.

Comment 64: Several comments were received urging NMFS to either require or encourage the use of sector ACLs and AMs and hold each sector accountable. Comments expressed that to provide the right incentives for conservation, catch reductions and increases must be tied to compliance and performance in adhering to ACLs. One commenter stated that MSA 303(a)(14) compels distinct ACLs and AMs for each sector due in part to the variation in management uncertainty among sectors. Sector management should be required in FMPs to ensure equitable treatment for all stakeholder groups including harvest restrictions and benefits to each sector.

Response: Separate ACLs and AMs for different fishery sectors may be appropriate in many situations, but the Councils should have the flexibility to determine this for each fishery. The decision to use sectors should be at the discretion of each Council. NMFS agrees that, if Councils decide to use sectors, each sector should be held accountable if catches for a sector exceed sector-ACLs. In addition, the NS1 guidelines provide that the ACL/AM system must protect the stock or stock complex as a whole. NMFS does not believe that MSA necessarily compels use of sector ACLs and AMs, thus the final action does not require their use. However, in developing any FMP or FMP amendment, it is important to ensure consistency with MSA 303(a)(14), NS 4, and other MSA provisions. Section 303(a)(14) pertains to allocation of harvest restrictions or recovery benefits fairly and equitably among commercial, recreational, and charter fishing sectors. NS 4, in part, pertains to fair and equitable allocations.

Comment 65: Some commenters expressed that managing recreational fisheries with ACLs and AMs will be difficult as they typically lack timely data. Comments included: The initiative to set ACLs and AMs for any fishery that has a recreational component cannot be done and any attempt will be arbitrary at best; in-season management is impractical in most recreational fisheries; current data collection programs used to evaluate recreational fishing activity do not offer a level of confidence to fisheries managers or fishermen to implement ACL in the recreational sector; and NMFS should improve recreational data collection to a level where inseason management is possible.

Response: NMFS acknowledges that recreational fisheries often do not have timely catch data and that is why NMFS suggested the multi-year averaging provision for AMs. NMFS and the Council still need to meet the mandate of the MSA and have ACLs for all fisheries. NMFS is developing a new data collection program for recreational fisheries to improve the data needed to implement the new provisions of the MSA.

Comment 66: Some commenters suggested that for recreational fisheries, catch limits should be expressed in terms of fishing mortality rates or in terms of numbers of fish instead of pounds of fish.

Response: NMFS intends that ACLs be expressed in terms of weight or numbers of fish. In fact, the definition of ''catch'' in the proposed guidelines indicates that catch is measured in weight or numbers of fish. NMFS disagrees that ACL can be expressed in terms of fishing mortality rates. While conservation and management measures for a fishery can be designed to achieve a target fishing mortality rate, the fishing mortality rates that are achieved can only be estimated by performing a stock assessment. Stock assessments usually lag the fishery by a year or more, and are not suitable as the basis for ACL accountability measures.

Comment 67: One commenter suggested that when recreational fisheries account for a significant portion of the catch, the buffers should be correspondingly larger to account for the management uncertainty.

Response: NMFS believes that management uncertainty should be addressed in all fisheries. Accountability measures may include an ACT set below the ACL based on the degree of uncertainty that the conservation and management measures will achieve the ACL. This applies to all fisheries, commercial or recreational.

Comment 68: NMFS received a few comments expressing that Councils should have flexibility when specifying AMs.

Response: NMFS agrees and believes that the guidelines provide this flexibility.

Comment 69: AMs should be approved by the Secretary of Commerce, should be subject to regular scientific review, and should provide opportunities for public comment; performance must be measurable and AMs must be modified if not working; AMs should be reviewed annually as part of the catch specification process.

Response: AMs will be implemented through public processes used for amending FMPs and implementing regulations. There is no need for additional guidance in the NS1 guidelines.

Comment 70: NMFS received comments that support the use of AMs based on comparisons of average catch to average ACL, if there is insufficient data to compare catch to ACL, either inseason or on an annual basis. In recreational fisheries, the use of a three-year rolling average ACL would moderate wild swings in ACLs due to variable fishing conditions and participation from year to year. Flexibility, such as the use of a multi-year average for the recreational sector, is needed due to limitations in the data collection. However, some commenters

expressed concerns about using the multi-year averaging approach and stated that it should be used rarely. In order to use such an approach, Councils should provide clear and compelling reasons in their FMPs as to why the use of multi-year average data are necessary and a plan for moving the fishery to AMs based on annual data. The guidelines should make it clear that AMs will be triggered annually in cases where the average catch exceeds the average ACL. NMFS should engage its quantitative experts in an investigation of the performance of using multi-year averages for managing highly variable fisheries with poor inseason data. Until such results are available, NMFS should use annual statistics for management of all fisheries, including those involving highly variable stocks or catch limits.

Response: Use of AMs based on comparison of average catch to average ACL is only appropriate in a limited number of fisheries, such as fisheries that have high variability in the estimate of total annual catch or highly fluctuating annual catches and no effective way to monitor and control catches inseason. NMFS intends that a comparison of the moving average catch to the average ACL would be conducted annually and that AMs would be implemented if average catch exceeds the average ACL. If the average catch exceeds the average ACL more than once in the last four years, then the system of ACLs and AMs should be re-evaluated and modified if necessary to improve its performance and effectiveness. NMFS agrees that the Council should analyze and explain why they are basing AMs on multi-year averaged data. NMFS has added clarifying language to § 600.310(g)(4) of the final action to make these points clear. Future improvements in data and management approaches should also be pursued so that true annual accountability for catch can be achieved. In addition, NMFS believes that AMs such as the use of ACT may be appropriate in fisheries that use the multi-year averaging approach.

Comment 71: Several comments were received regarding ACLs and AMs for fisheries that occur partly in state waters. Some comments stated that accountability measures for State-Federal fisheries could use further elaboration and should specifically address fisheries where management had been delegated to the state. Some commenters supported separate ACLs and AMs for Federal and state portions of the fishery, while others wanted combined overall ACLs and AMs. Some comments disagreed that closure of Federal waters while fishing continues in non-Federal waters is a preferred option, and that efforts should be made to undertake cooperative management that allows coordinated responses.

Response: When stocks are co-managed by Federal, state, tribal, and/or territorial fishery managers, the goal should be to develop collaborative conservation and management strategies to prevent overfishing of shared stocks and ensure their sustainability. NMFS encourages collaboration with state managers to develop ACLs and AMs that prevent overfishing of the stock as a whole. As FMPs currently consider whether overfishing is occurring for a stock or stock complex overall, NMFS thinks it is appropriate to specify an overall ACL for the stock or stock complex. This ACL could be subdivided into state and Federal ACLs, similar to the approach used for sector-ACLs. However, NMFS recognizes that Federal management authority is limited to that portion of the fishery under Federal jurisdiction and therefore the NS1 guidelines only require AMs for the Federal fishery. The AMs could include closing the EEZ when the Federal portion of the ACL is reached, closing the EEZ when the overall stock or stock complex's ACL is reached, or other measures. NMFS recognizes the problem that may occur when Federal fisheries are closed but fishing continues in state waters. NMFS will continue to work with states to ensure consistency and effectiveness of management measures. If Councils delegate management under an FMP to the states, the FMPs still need to meet the requirements of the MSA, including establishment of ACLs and AMs.

Comment 72: One commenter asked, in the case where ACLs are exceeded because of the regulatory failures of one state, if other states in the Council's or the Atlantic States Marine Fisheries Commission's (ASMFC) area of jurisdiction be affected through mandatory AMs. Barring state-by-state allocations for all species (as with summer flounder), the proposed regulations could punish commercial fishermen and anglers in all states in a region.

Response: The guidelines acknowledge that NMFS and the Councils cannot mandate AMs on state fisheries. However, NMFS encourages collaboration between state and Federal managers to develop ACLs and AMs to prevent overfishing for the stock as a whole. In cases where there is collaboration, accountability measures for the fishery should be designed to address this issue. Specific AMs that may be needed would have to be evaluated and addressed on a case-by-case basis.

Comment 73: NMFS received a question regarding the meaning of the phrase ''large majority'' in § 600.310(g)(5) of the proposed action. NMFS had stated that: ''For stocks or stock complexes that have a large majority of harvest in state or territorial waters, AMs should be developed for the portion of the fishery under Federal authority and could include closing the EEZ when the Federal portion of the ACL is reached, or the overall stock's ACL is reached, or other measures.'' The commenter stated that the meaning of the term ''large majority'' and its importance is not clear and should therefore be eliminated.

Response: NMFS agrees that ACL and AMs need to be established for all stocks and stock complexes in Federal fisheries regardless of the whether a large majority of harvest occurs in state waters. NMFS agrees the amount, *i.e.*, ''large majority,'' is not pertinent to this provision. Therefore, § 600.310(f)(5)(iii) and (g)(5) have been revised in the final action.

Comment 74: NMFS received several comments noting that NMFS should require or recommend the use of limited access privilege programs (LAPPs) or catch shares by Councils in the final rule. Many commenters referenced an article on catch shares (Costello *et al.* 2008).

Response: The article cited above and other articles note the potential benefits of LAPPs. NMFS supports use of LAPPs, and believes they can be a beneficial approach to use in implementing effective ACLs. However, while ACLs are required in all fisheries, under the MSRA, LAPPs are optional and at the discretion of each Council. NMFS does not have authority to require Councils to use LAPPs, but is currently developing guidelines on LAPPs that will be published for public comment in the future.

Comment 75: One comment requested that NMFS expand the concept of accountability measures to include effective catch monitoring, data collection and analysis, and enforcement. The commenter suggested that for accountability measures that are not LAPPs, managers should demonstrate how the measures will ensure compliance with the ACLs as well as improve data and enforcement, reduce bycatch, promote safety, and minimize adverse economic impacts at least as well as LAPPs.

Response: NMFS agrees that catch monitoring, data collection and analysis, and enforcement are all important to consider in developing

AMs for a fishery and believes the guidelines are adequate. Under § 600.310(i) of the final action, FMPs, or associated documents such as SAFE reports, must describe data collection methods. In addition, § 600.310(g)(2) of the final action, states that whenever possible, inseason AMs should include inseason monitoring and management measures to prevent catch from exceeding ACLs. NMFS believes the guidelines are clear that catch monitoring data is very important to consider when Councils establish their AMs. Councils are already directed to: minimize adverse economic impacts under National Standard 8; minimize bycatch and bycatch mortality under National Standard 9; and promote safety of human life at sea under National Standard 10. *See* MSA 301(a)(8), (9), and (10) (setting forth specific requirements of the national standards).

Comment 76: NMFS received comments expressing concern about establishing ACL and AM mechanisms in FMPs. One commenter expressed concern that if ACL and AM mechanisms were located in the FMP, it would require a multi-year process to change any measure. They instead suggested that Councils should have the ability to framework the mechanisms and establish an annual or multi-year process for making adjustments. Another commenter suggested that Councils should be required to modify their SOPPs to incorporate a mechanism for specifying ACLs and reviewing AMs annually through regular catch specification procedures. NMFS received another comment that disagreed with the idea that the Council's SOPPs are the proper place to describe the process for establishing ABC Control Rules, including the role of SouthEast Data Assessment and Review (SEDAR) and the SSC. This commenter recommended instead that ABC Control Rules be included in Fishery Management Plans and have the ability to refine management through framework actions.

Response: The FMP needs to contain the ACL mechanisms and AMs, as they are part of the conservation and management measures for the fishery. The ACL mechanisms and AMs can contain framework provisions and utilize specification processes as appropriate. NMFS does not agree that the ACL and AM mechanisms should be established in the SOPPs. Also, NMFS never intended that ABC control rules would be described in the SOPPs and agrees that the ABC control rules should be described in the Fishery Management Plans. However, it is important to understand how the Councils, SSC, and peer review process work together to implement the provisions of the MSA, and that can be explained in the SOPPs, FMP, or some other document.

Comment 77: NMFS received several comments supporting the exception to the ACL rule for stocks with a life cycle of approximately one year. Commenters asked for a list of species which fit the exception, specific guidance on how to set ACLs for these stocks if they become overfished, and expansion of the exception to species with a two year life cycle.

Response: Due to their unique life history, the process for setting ACLs does not fit well for stocks which have a life cycle of approximately one year. The exception for species with an annual life cycle allows flexibility for Councils to use other management measures for these stocks which are more appropriate for the unique life history for each stock and the specifics of the fishery which captures them. NMFS believes that the final guidance should not include a list of stocks which meets these criteria; this is a decision that is best made by the regional Councils. Even though ACLs are not required for these stocks, Councils are still required to estimate other biological reference points such as SDC, MSY, OY, ABC and an ABC control rule. However, the MSA limits the exception and clearly states that if overfishing is occurring on the stock, the exception can not be used, therefore ACLs would be required. MSA only provided for a 1-year life cycle exception, thus NMFS cannot expand the exception to two years. Section (h)(3) of the final action acknowledges that there may be circumstances when flexibility is needed in applying the NS1 guidelines. Whether such flexibility is appropriate for certain two year life cycle species would have to be considered on a case-by-case basis.

Comment 78: NMFS received many comments expressing different interpretations of the MSA's ACL international exception. Some commented that the exception only pertains to the 2010/2011 timing requirement. If fisheries under international agreements were intended to be exempt from ACLs, Congress could have drafted the exception to say that ACLs ''shall not apply'' to such fisheries, similar to language used in the one-year life cycle exception. Several comments stated that by requiring ACLs for U.S. fishermen, the U.S. would be in a better bargaining position in international fora by taking the ''higher ground.'' Others agreed with the exception as set forth in the proposed guidelines but requested clarification. For example, one comment was that the exception should be expanded to cover the US/Canada Resource Sharing Understanding and other arrangements that may not be formal international agreements. Other suggestions included clarifying that the exception applied where a regional fishery management organization had approved a stock assessment, where there were conservation and management measures under an international agreement, or where there were annual catch limits established under international agreement consistent with MSA overfishing and rebuilding requirements.

Response: The ACL international exception is set forth in an uncodified note to MSA section 303. MSRA, Public Law 109–479 section 104(b)(1). The text is vague, and NMFS has spent considerable time looking at different possible interpretations of this text in light of the plain language of the text, public comments, and other relevant MSA provisions. NMFS agrees that one possible interpretation, in light of the text of the one-year life cycle exception (MSRA section 104(b)(2)), is that stocks under international management are only exempt from timing requirements. However, Congress added significant new requirements under the MSRA regarding international fisheries, thus NMFS has tried to interpret the exception in light of these other statutory provisions.

In many fisheries, the U.S. unilaterally cannot end overfishing or rebuild stocks or make any measurable progress towards those goals, even if it were to stop all U.S. harvest. Thus, it has signed onto various treaties and negotiates binding, international conservation and management measures at regional fishery management organizations (RFMOs) to try to facilitate international efforts to end overfishing and rebuild overfished stocks. MSRA acknowledged the challenges facing the United States in international fisheries by, among other things, including a new ''International Overfishing'' section (MSA section 304(i)) that refers domestic regulations to address ''relative impact'' of U.S. vessels; changes to highly migratory species provisions (MSA section 102(b)–(c)); and amendments to the High Seas Driftnet Fishing Moratorium Protection Act, 16 U.S.C. 1826h–1826k, to encourage strengthening of RFMOs and establish a process for identification and certification of nations whose vessels engage in illegal, unreported or unregulated (IUU) fishing and bycatch of protected living marine resources.

While NMFS actively communicates and promotes MSA requirements regarding ending overfishing and rebuilding overfished stocks at the international level (*see*, *e.g.*, MSA section 102(c)), it is unlikely that RFMOs will adopt ACL/AM mechanisms as such mechanisms are understood and required in the context of U.S. domestic fisheries. Given the practical problem of ensuring the U.S. could negotiate such mechanisms, and Congress' clear recognition of U.S. fishing impact versus international fishing effort, NMFS believes that a reasonable interpretation of the exception is that it should apply to the ACL requirement, not just the effective date. If ACLs were required, a likely outcome is that U.S. fishermen may be subject to more restrictive measures than their foreign counterparts, *e.g.*, each country may be assigned a catch quota but the U.S. portion may be subject to further restriction below the assigned amount. Further, requiring ACLs may raise potential conflicts with implementing legislation for some of the international fishery agreements.

NMFS believes that the intent of MSRA is to not unfairly penalize U.S. fishermen for overfishing which is occurring predominantly at the international level. In many cases, applying ACL requirements to U.S. fishermen on just the U.S. portion of the catch or quota, while other nations fished without such additional measures, would not lead to ending overfishing and could disadvantage U.S. fishermen. The guidance given for the international exception allows the Councils to continue managing the U.S. portion of stocks under international agreements, while the U.S. delegation works with RFMOs to end overfishing through international cooperation. The guidelines do not preclude Councils or NMFS from applying ACLs or other catch limits to stocks under international agreements, if such action was deemed to be appropriate and consistent with MSA and other statutory mandates.

NMFS considered different suggestions on how the exception might be clarified, *e.g.*, exception would only apply where there is an approved stock assessment, conservation and management measures, annual catch limits consistent with MSA overfishing and rebuilding requirements, etc. Regardless of how the exception could be revised, establishing ACL mechanisms and AMs on just the U.S. portion of the fishery is unlikely to have any impact on ending overfishing and rebuilding. For these reasons, and taking into consideration possible statutory interpretations and public comment, NMFS has decided not to revise the international exception.

With regard to whether an arrangement or understanding is an ''international agreement,'' it will be important to consider the facts and see if the arrangement or understanding qualifies as an ''international agreement'' as understood under MSA section 3(24) (defining ''international fishery agreement'') and as generally understood in international negotiation. The Case-Zablocki Act, 1 U.S.C. 112b, and its implementing regulations provide helpful guidance on interpreting the term ''international agreement.''

Comment 79: With regard to fisheries data (§ 600.310(i) of NS1 guidelines), comments included: data collection guidelines are burdensome, clarification is needed on how the Councils would implement the data collection requirements, and that data collection performance standards and real-time accounting are needed.

Response: NMFS believes that § 600.310(i) of the final action provides sufficient guidance to the Councils in developing and updating their FMPs, or associated public documents such as SAFE reports, to address data needed to meet the new requirements of the MSRA. There is a close relationship between the data available for fishery management and the types of conservation and management measures that can be employed. Also, for effective prevention of overfishing, it is essential that all sources of fishing mortality be accounted for. NMFS believes that detailing the sources of data for the fishery and how they are used to account for all sources of fishing mortality in the annual catch limit system will be beneficial. NMFS revised the final guidelines to clarify that a SAFE report, or other public document adopted by a Council, can be used to document the required fishery data elements.

Comment 80: NMFS received several comments requesting that better data be used when creating conservation and management measures.

Response: NMFS agrees that improvements in fishery data can lead to more effective conservation and management measures, including ACLs. NMFS is aware of the various gaps in data collection and analysis for FMPs in U.S. fisheries, and has ongoing and future plans to improve the data needed to implement the new provisions of the MSRA. NMFS programs and initiatives that will help produce better quality data include the: Marine Recreational Information Program (MRIP), National Permits System, and Fisheries Information and National Saltwater Angler Registry.

Comment 81: Some comments recognized the ongoing programs to improve data, but were concerned that the time that it would take to implement and fold these new data into the management process could cause overly restrictive measures when implementing ACLs on fisheries that are data poor (*e.g.* recreational fisheries).

Response: ACLs must be implemented using the best data and information available. Future improvements in data will allow corresponding improvements in conservation and management measures. This is an incremental process. NMFS believes that Councils must implement the best ACLs possible with the existing data, but should also look for opportunities to improve the data and the ACL measures in the future. It is important that the ACL measures prevent overfishing without being overly restrictive. In data poor situations, it is important to monitor key indicators, and have accountability measures that quickly adjust the fishery in response to changes in those indicators.

Comment 82: Some commenters noted they want more transparency in the data being used to manage fisheries.

Response: NMFS believes the NS1 guidelines provide sufficient guidance to the Councils in developing and updating their FMPs, or associated public documents such as SAFE reports, to address data needed to meet the new requirements of the MSRA. NMFS agrees that transparency in the Council process and NMFS decision process in regard to data and data analysis is critical to the public and user groups understanding of how fisheries are managed. NMFS is aware of this issue and will continue to seek improvements in such processes.

Comment 83: NMFS received several comments about the timing associated with submitting a rebuilding plan. Commenters asked for clarification on when the clock started for the implementation of the plan, stated that Councils should have two years to submit the plan to the Secretary, and suggested that a 6-month review/implementation period be used instead of a 9-month period. Commenters noted that MSA provides for specific time periods for Secretarial review.

Response: Ending overfishing and rebuilding overfished stocks is an important goal of the MSA and the performance of NMFS is measured by its ability to reach this goal. Currently, the Council has 12 months to submit an FMP, FMP amendment, or proposed

regulations to the Secretary, but there is no time requirement for implementation of such actions. MSA section 304(e)(3), which is effective July 12, 2009, requires that a Council prepare and implement an FMP, FMP amendment, or proposed regulations within 2 years of the Secretary notifying the council that the stock is overfished or approaching a condition of being overfished. The guidelines provide that such actions should be submitted to the Secretary within 15 months so NMFS has 9 months to review and implement the plan and regulations. NMFS recognizes that there are timing requirements for Secretarial review of FMPs and regulations (MSA section 304(a),(b)). The 15-month period was not intended to expand the time for Secretarial review, but rather, to address the new requirement that actions be implemented within two years. NMFS believes the timing set forth in the guidelines is appropriate as a general rule: it would continue to allow for 60 days for public comment on an FMP, 30 days for Secretarial review, and 6 months for NMFS to implement the rebuilding plan. However, in specific cases NMFS and a Council may agree on a schedule that gives the Council more time, if the overall objective can still be met.

Comment 84: NMFS received many comments in support of the language regarding ending overfishing immediately. One comment, however, stated that intent of the MSA is to end all overfishing, not just chronic overfishing, as described in the preamble.

Response: NMFS agrees that the intent of the MSA is to end overfishing, and in the context of a rebuilding plan, overfishing must be ended immediately. However, as long as fishing is occurring, there always is a chance that overfishing may occur given scientific and management uncertainty. The guidelines explain how to incorporate scientific and management uncertainty so that fishing may continue but with an appropriately low likelihood of overfishing. The term ''chronic overfishing'' is used to mean that annual fishing mortality rates exceed the MFMT on a consistent basis over a period of years. The MSA definition of overfishing is ''* * * a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis.'' NMFS believes that the best way to ensure that overfishing does not occur is to keep annual fishing mortality rates below the MFMT. However, exceeding the MFMT occasionally does not necessarily jeopardize the capacity of a fishery to produce the MSY on a continuing basis. The more frequently MFMT is exceeded, the more likely it becomes that the capacity of a fishery to produce the MSY on a continuing basis is jeopardized. Thus, NMFS believes that ACLs and AMs should be designed to prevent overfishing on an annual basis, but that conservation and management measures need not be so conservative as to prevent any possibility that the fishing mortality rate exceeds the MFMT in every year.

Comment 85: NMFS received several comments regarding what happens when a rebuilding plan reaches T_{max} but the stock is not fully rebuilt. Commenters supported the approach in the proposed action that provided that the rebuilding F should be reduced to no more than 75 percent of MFMT until the stock or stock complex is rebuilt. One commenter suggested clarifying the final guidelines text to provide: ''If the stock or stock complex has not rebuilt by T_{max}, then the fishing mortality rate should be maintained at $F_{rebuild}$ or 75% of the MFMT, whichever is less.'' Other commenters stated that 75 percent MFMT is not precautionary enough and that 50 percent MFMT (or less) should be used.

Response: This new language in the guidelines fills a gap in the current guidelines which did not prescribe how to proceed when a stock had reached T_{max} but had not been fully rebuilt. NMFS believes that requiring that F does not exceed $F_{rebuild}$ or 75 percent MFMT, whichever is lower, is an appropriate limit, but Councils should consider a lower mortality rate to meet the requirement to rebuild stocks in as short a time as possible, pursuant to the provisions in MSA section 304(e)(4)(a)(i). NMFS agrees that the suggested edit would clarify the provision, and has revised the guidelines.

Comment 86: NMFS received many comments on the relationship between T_{min}, T_{target} and T_{max}. Some comments supported the proposed guidelines and others stated that the guidelines should be modified. Comments included: T_{min} is inconsistent with MSA's requirement to take into account needs of fishing communities and should include those needs when evaluating whether rebuilding can occur in 10 years or less; management measures should be designed to achieve rebuilding by the T_{target} with at least a 50% probability of success and achieve T_{max} with a 90% probability of success; as in the 2005 proposed NS1 guidelines revisions, T_{max} should be calculated as T_{min} plus one mean generation time for purposes of determining whether rebuilding can occur in 10 years or less; per *NRDC* v. *NMFS,* 421 F.3d 872 (9th Cir. 2005), T_{target} should be as close to T_{min} as possible without causing a short-term disaster; rebuilding timeframes should only be extended above T_{min} where ''unusually severe impacts on fishing communities can be demonstrated, and where biological and ecological implications are minimal;'' rebuilding times for stock complexes must not be used to delay recovery of complex member species; and the ''generation time'' calculation for T_{max} should refer to generation time of the current population.

Response: In developing the guidance for rebuilding plans, NMFS developed guidelines for Councils which, if followed, are strong enough to rebuild overfished stocks, yet flexible enough to work for a diverse range of fisheries. The timeline for a rebuilding plan is based on three time points, T_{min}, T_{target} and T_{max}. T_{min} is the amount of time, in the absence of any fishing mortality, for the stock to have a 50% probability of reaching the rebuilding goal, B_{msy}. T_{min} is the basis for determining the rebuilding period, consistent with section 304(e)(4)(A)(ii) of the MSA which requires that rebuilding periods not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise. T_{min} provides a biologically determined lower limit to T_{target}. Needs of fishing communities are not part of the criteria for determining whether a rebuilding period can or cannot exceed 10 years, but are an important factor in establishing T_{target}.

Just as T_{min} is a helpful reference point of the absolute shortest time to rebuild, T_{max} provides a reference point of the absolute longest rebuilding period that could be consistent with the MSA. T_{max} is clearly described in the guidelines as either 10 years, if T_{min} is 10 years or less, or T_{min} plus one generation time for the stock if T_{min} is greater than 10 years. NMFS agrees that this calculation can cause a discontinuity problem when calculating T_{max}, and proposed revisions to the NS1 guidelines in 2005 that would have addressed the issue by basing T_{max} on T_{min} + one generation time in all cases, which would have removed the requirement that T_{max} is 10 years in all cases where T_{min} was less than 10 years. NMFS did not finalize those revisions, but proposed the same changes to the MSA in the Administration's proposed MSA reauthorization bill. However,

when MSRA was passed, Congress did not accept the Administration's proposal and chose to keep the existing provision. NMFS has, therefore, not revised this aspect of the NS1 guidelines.

The generation time is defined in the guidelines as ''the average length of time between when an individual is born and the birth of its offspring.'' Typically this is calculated as the mean age of the spawners in the absence of fishing mortality (per Restrepo *et al.,* 1998), but the exact method is not specified in the guidance.

T_{max} is a limit which should be avoided. When developing a rebuilding plan, it is good practice for Councils to calculate the probability of the potential management alternatives to achieve rebuilding by T_{max}, in order to inform their decision.

T_{target} is bounded by T_{min} and T_{max} and is supposed to be established based on the factors specified in MSA section 304(e)(4). Section 600.310(j)(3) of the final action reiterates the statutory criteria on specifying rebuilding periods that are ''as short as possible,'' taking into account specified factors. Management measures put in place by the rebuilding plan should be expected (at least 50% probability) to achieve rebuilding by T_{target}. NMFS does not believe these sections should be revised to focus on ''short-term disasters'' or ''unusually severe'' community impacts, as the MSA provides for several factors to be considered. NMFS believes the final guidelines provide sufficient general guidance on the MSA requirements, but acknowledges that there is case law in different jurisdictions (such as NRDC v. NMFS), that fishery managers should consider in addition to the general guidance.

Comment 87: A commenter stated that § 600.310(j)(3)(i)(E) of the proposed action should be revised to state that ''as short as possible'' is a mandate, not just a priority.

Response: NMFS deleted the ''priority'' text in § 600.310 (j)(3)(i)(E) of the final action. That text is unnecessary given that § 600.310 (j)(3)(i) of the guidelines explains ''as short as possible'' and other rebuilding time period requirements from MSA section 304(e)(4).

Comment 88: Commenters raised several questions about the relationship of NS1 and National Standard 8 (NS 8), including whether NS 1 ''trumps'' NS 8 and whether the ACL guidance provides sufficient flexibility to address NS 8 considerations.

Response: NS 1 states: ''Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.'' MSA section 301(a)(1). NS 8 states: ''Conservation and management measures shall, *consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks,* take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of paragraph (2) [*i.e.*, National Standard 2] , in order to (A) provide for sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.'' MSA section 301(a)(8) (*emphasis added*).

The objectives in NS8 for sustained participation of fishing communities and minimization of adverse economic impacts do not provide a basis for continuing overfishing or failing to rebuild stocks. The text of NS8 explicitly provides that conservation and management measures must prevent overfishing and rebuild overfished stocks. MSA does provide, however, for flexibility in the specific conservation and management measures used to achieve its conservation goals, and NMFS took this into consideration in developing the revised NS1 guidelines.

Comment 89: NMFS received many comments regarding § 600.310(m) of the proposed action, a provision commonly called the ''mixed stock exception.'' One comment supported the revision as proposed. Some commenters noted that the provision is very important in managing specific mixed stock fisheries, and that changes in the proposed guidelines would make it impossible to use. Specific concern was noted about text that stated that the ''resulting rate of fishing mortality will not cause any stock or stock complex to fall below its MSST more than 50 percent of the time in the long term.'' In addition, commenters stated that the proposed revisions do not allow for social and economic aspects to be taken in to account adequately and would negatively impact several fisheries and fishing communities. Many others commented that the provision should be removed entirely, because it is contrary to the intent of the MSA. The MSA, as amended by the MSRA, requires preventing and ending overfishing, and a mixed stock exception would allow for chronic overfishing on vulnerable fish stocks within a complex.

Response: MSRA amended overfishing and rebuilding provisions of the MSA, reflecting the priority to be given to the Act's conservation goals. NMFS believes that the final NS1 guidelines provide helpful guidance on the new statutory requirements and will strengthen efforts to prevent overfishing from occurring in fisheries. Preventing overfishing and achieving, on a continuing basis, the OY is particularly challenging in mixed stock fisheries. To address this issue, the proposed action retained a mixed stock exception. NMFS recognizes the concerns raised about how the exception will impact efforts to prevent and end overfishing, and thus, revised the current NS1 guidelines text in light of new MSRA provisions.

The current mixed stock exception allows overfishing to occur on stocks within a complex so long as they do not become listed under the Endangered Species Act (ESA). As explained in the proposed guidelines, NMFS believes that ESA listing is an inappropriate threshold, and that stocks should be managed so they retain their potential to achieve MSY. The revised guidelines propose a higher threshold, limiting F to a level that will not lead to the stock becoming overfished in the long term. In addition, if any stock, including those under the mixed stock exception, were to drop below its MSST, it would be subject to the rebuilding requirements of the MSA, which require that overfishing be ended immediately and that the stock be rebuilt to B_{msy} (see § 600.310(j)(2)(ii)(B) of the final action). The exception, as revised, addresses concerns regarding social, economic, and community impacts as it could allow for continued harvest of certain stocks within a mixed stock fishery.

Having considered public comments on the proposed guidelines, NMFS has decided to retain the mixed stock exception as proposed in the guidance. While NMFS has chosen in the NS1 guidelines to emphasize the importance of stock-level analyses, MSA refers to preventing overfishing in a fishery and provides for flexibility in terms of the specific mechanisms and measures used to achieve this goal. The mixed stock exception provides Councils with needed flexibility for managing fisheries, while ensuring that all stocks in the fishery continue to be subject to strong conservation and management. However, NMFS believes that the mixed stock exception should be applied with a great deal of caution, taking into consideration new MSRA requirements and NS1 guidance regarding stock complexes and indicator species. NMFS also believes that Councils should work to improve selectivity of fishing gear and practices in their mixed-stock fisheries so that the need to apply the mixed stock exception is reduced in the future.

VI. Changes From Proposed Action

Annual catch target (ACT) is described as a management option, rather than a required reference point in paragraphs (f)(1), (f)(2)(v), (f)(6), (f)(6)(i), and (g)(2) in the final action.

The following sentence was deleted from paragraph (b)(2)(v)(B): ''The SSC may specify the type of information that should be included in the Stock Assessment and Fishery Evaluation (SAFE) report (*see* § 600.315).'' Paragraph (b)(2)(v)(C) was revised to make some clarifying edits regarding the SSC and peer review process. The following sentence was included in (b)(2)(v)(D): ''The SSC recommendation that is the most relevant to ACLs is ABC, as both ACL and ABC are levels of annual catch.''

Paragraph (c)(5) is removed because ''ACT control rule'' is no longer a required part of the definition framework. Paragraph (c)(6) in the proposed action is re-designated as paragraph (c)(5) in the final action. Paragraph (c)(7) in the proposed action is re-designated as paragraph (c)(6) in the final action.

Paragraph (d)(1) was revised to clarify that Councils may, but are not required to, use the ''ecosystem component'' species classification. Paragraphs (d)(2) through (d)(7) were revised to better clarify the classification system for stocks in an FMP. Paragraph (d)(9) is revised to emphasize that indicator stocks are stocks with SDC that can be used to help manage more poorly known stocks that are in a stock complex. Paragraph (d)(10) has been added to describe in general how to evaluate ''vulnerability'' of a stock.

Paragraph (e)(1)(iv) was revised to clarify that ecological conditions should be taken into account when specifying MSY. The following sentence was added to paragraph (e)(2)(i)(C): ''The MFMT or reasonable proxy may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential.'' The following sentence was added to paragraph (e)(2)(i)(D): ''The OFL is an estimate of the catch level above which overfishing is occurring.'' The following sentence was deleted from (e)(2)(ii)(A)(*1*): ''The MFMT must not exceed F_{msy}.'' Paragraph (e)(3)(iv) was revised to improve clarity. The following sentence was deleted from (e)(3)(v)(A): ''As a long-term average, OY cannot exceed MSY.''

Paragraph (f)(1) was revised to give examples of scientific and management uncertainty. Paragraphs (f)(2)(ii) and (iii) were revised to clarify that scientific uncertainty in the OFL and any other scientific uncertainty should be accounted for when specifying ABC and the ABC control rule. Paragraph (f)(3) was revised to improve clarity; to acknowledge that the SSC may recommend an ABC that differs from the result of the ABC control rule calculation; and to state that while the ABC is allowed to equal OFL, NMFS expects that in most cases ABC will be reduced from OFL to reduce the probability that overfishing might occur in a year. Paragraph (f)(4) on the ABC control rule was revised to include the following sentences: ''The determination of ABC should be based, when possible, on the probability that an actual catch equal to the stock's ABC would result in overfishing. This probability that overfishing will occur cannot exceed 50 percent and should be a lower value. The ABC control rule should consider reducing fishing mortality as stock size declines and may establish a stock abundance level below which fishing would not be allowed.'' Paragraph (f)(5)(i) was revised to include the following sentences: ''ACLs in coordination with AMs must prevent overfishing (see MSA section 303(a)(15)). If a Council recommends an ACL which equals ABC, and the ABC is equal to OFL, the Secretary may presume that the proposal would not prevent overfishing, in the absence of sufficient analysis and justification for the approach.'' Also, paragraph (f)(5)(i) was revised to clarify that ''a multiyear plan must provide that, if an ACL is exceeded for a year, then AMs are triggered for the next year consistent with paragraph (g)(3) of this section.'' Paragraph (f)(5)(ii) now clarifies that ''if the management measures for different sectors differ in degree of management uncertainty, then sector-ACLs may be necessary so appropriate AMs can be developed for each sector.'' Paragraphs (f)(5)(iii) and (g)(5) were revised to remove the phrase ''large majority'' from both provisions. The description of the relationship between OFL to MSY and ACT to OY was removed from paragraph (f)(7) and is replaced with the following sentence: ''A Council may choose to use a single control rule that combines both scientific and management uncertainty and supports the ABC recommendation and establishment of ACL and if used ACT.''

Paragraph (g)(2) on inseason AMs was revised to include the following sentences: ''FMPs should contain inseason closure authority giving NMFS the ability to close fisheries if it determines, based on data that it deems sufficiently reliable, that an ACL has been exceeded or is projected to be reached, and that closure of the fishery is necessary to prevent overfishing. For fisheries without inseason management control to prevent the ACL from being exceeded, AMs should utilize ACTs that are set below ACLs so that catches do not exceed the ACL.'' Paragraph (g)(3) was revised to improve clarity and to include the following sentence: ''A Council could choose a higher performance standard (e.g., a stock's catch should not exceed its ACL more often than once every five or six years) for a stock that is particularly vulnerable to the effects of overfishing, if the vulnerability of the stock has not already been accounted for in the ABC control rule.'' Paragraph (g)(4) on AMs based on multi-year average data was revised to clarify: That Councils should explain why basing AMs on a multi-year period is appropriate; that AMs should be implemented if the average catch exceeds the average ACL; the performance standard; and that Councils can use a stepped approach when initially implementing AMs based on multi-year average data.

Paragraph (h) was revised to include the sentence: ''These mechanisms should describe the annual or multiyear process by which specific ACLs, AMs, and other reference points such as OFL, and ABC will be established.'' Paragraph (h)(1)(v) was removed because the requirement to describe fisheries data is covered under paragraph (i). Paragraph (i) is revised to clarify that Councils must describe ''in their FMPs, or associated public documents such as SAFE reports as appropriate,'' general data collection methods.

Paragraph (j)(2)(ii)(C) was removed and paragraph (j)(2)(ii)(B) was revised to include information about stocks or stock complexes that are approaching an overfished condition. Paragraph (j)(3)(i)(E) was revised to remove the ''priority'' text. That text is unnecessary given that section (j)(3)(i) explains ''as short as possible'' and other rebuilding time period requirements from MSA section 304(e)(4). Paragraph (j)(3)(ii) was revised to clarify that ''if the stock or stock complex has not rebuilt by T_{max}, then the fishing mortality rate should be maintained at $F_{rebuild}$ or 75 percent of the MFMT, whichever is less.''

Introductory language (General) has been added to paragraph (l) to clarify the relationship of other national standards to National Standard 1. Also, paragraph (l)(4) has been revised to ensure that the description about the relationship between National Standard 8 with National Standard 1 reflects more

accurately, section 301(a)(8) of the Magnuson-Stevens Act.

The words ''should'' or ''recommended'' in the proposed rule are changed to ''must'' or ''are required'' or ''need to'' in this action's codified text if NMFS interprets the guidance to refer to ''requirements of the Magnuson-Stevens Act'' and ''the logical extension thereof'' (see section 600.305(c) of the MSA). In the following, items in paragraphs of § 600.310 are followed by an applicable MSA section that contains pertinent requirements:

Paragraph (b)(3) is revised to state that Councils ''must take an approach that considers uncertainty in scientific information and management control of the fishery'' because it needs to meet requirements in MSA section 303(a)(15).

Paragraph (c) is revised to state ''* * * Councils must include in their FMPs * * *'' because it needs to meet various requirements in MSA section 303(a).

Paragraph (c) is revised to state ''Councils must also describe fisheries data * * *'' because it needs to meet requirements of various portions of MSA sections 303(a) and 303(a)(15).

Paragraph (c) is revised to state ''* * * Councils must evaluate and describe the following items in their FMPs * * *'' because it needs to meet requirements of various portions of MSA sections 303(a) and 303(a)(15).

Paragraph (e)(1) is revised to state that ''Each FMP must include an estimate of MSY * * *'' because it needs to meet requirements of MSA section 303(a)(3).

Paragraph (e)(2)(ii) is revised to state that a Council ''must provide an analysis of how the SDC were chosen * * *'' because it needs to meet requirements of MSA section 303(a)(10).

Paragraph (e)(2)(ii)(A) is revised to state ''each FMP must describe which of the following two methods * * *'' because it needs to meet requirements of MSA section 303(a)(10).

Paragraph (e)(2)(ii)(B) is revised to state ''the MSST or reasonable proxy must be expressed in terms of spawning biomass * * *'' because it needs to meet requirements of MSA section 303(a)(10).

Paragraph (f)(4) is revised to state each Council ''must establish an ABC control rule * * *'' because it needs to meet requirements of MSA sections 303(a)(15) and 302(g)(1)(B).

Paragraph (f)(4) is revised to state ''The ABC control rule must articulate how ABC will be set compared to the OFL * * *'' because it needs to meet requirements of MSA sections 303(a)(15) and 301(a)(2).

Paragraph (f)(5)(i) is revised to state ''A multiyear plan must include a mechanism for specifying ACLs for each year * * *'' because it needs to meet requirements of MSA section 303(a)(15).

Paragraph (f)(5)(i) is also revised to state ''A multiyear plan must provide that, if an ACL is exceeded * * *'' because it needs to meet requirements of MSA section 303(a)(15).

Paragraph (f)(6)(i) is revised to state ''Such analyses must be based on best available scientific * * *'' because it needs to meet requirements of MSA section 301(a)(2).

Paragraph (g)(3) is revised to state a Council ''must determine as soon as possible after the fishing year if an ACL is exceeded * * *'' because it needs to meet requirements of MSA sections 303(a)(15), 301(a)(1) and 301(a)(2).

Paragraph (h) is revised to state FMPs or FMP amendments ''must establish ACL mechanisms and AMs * * *'' because it needs to meet requirements of MSA section 303(a)(15).

Paragraph (h)(3) is revised to state ''Councils must document their rationale for any alternative approaches * * *'' because it needs to meet requirements of MSA section 303(a)(15).

Paragraph (j)(2) is revised to state ''FMPs or FMP amendments must establish ACL and AM mechanisms in 2010 * * *'' because it needs to meet requirements of MSA section 303(a)(15).

Paragraph (j)(2)(i)(A) is revised to state that '' * * * ACLs and AMs themselves must be specified * * *'' because it needs to meet requirements of MSA section 303(a)(15).

Paragraph (k) is revised to state that ''The Secretary, in cooperation with the Secretary of State, must immediately take appropriate action at the international level * * *'' because it needs to meet requirements of MSA section 304(i)—INTERNATIONAL OVERFISHING.

Paragraph (k)(3) is revised to state that ''Information used to determine relative impact must be based upon the best available scientific * * *'' because it needs to meet requirements of MSA section 301(a)(2).

Paragraph (l)(2) is revised to state that ''Also scientific assessments must be based on the best information * * *'' because it needs to meet requirements of MSA section 301(a)(2).

VII. References Cited

A complete list of all the references cited in this final action is available online at: *http://www.nmfs.noaa.gov/msa2007/catchlimits.htm* or upon request from Mark Millikin [*see* **FOR FURTHER INFORMATION CONTACT**].

VIII. Classification

Pursuant to the Magnuson-Stevens Act, the NMFS Assistant Administrator has determined that these final NS1 guidelines are consistent with the Magnuson-Stevens Act, and other applicable law.

The final NS1 guidelines have been determined to be significant for purposes of Executive Order 12866. NOAA prepared a regulatory impact review of this rulemaking, which is available at: *http://www.nmfs.noaa.gov/msa2007/catchlimits.htm.* This analysis discusses various policy options that NOAA considered in preparation of the proposed action, given NOAA's interpretation of the statutory terms in the MSRA, such as the appropriate meaning of the word ''limit'' in ''Annual Catch Limit,'' and NOAA's belief that it has become necessary for Councils to consider separately the uncertainties in fishery management and the scientific uncertainties in stock evaluation in order to effectively set fishery management policies and ensure fulfillment of the goals to end overfishing and rebuild overfished stocks.

The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration during the proposed rule stage that these revisions to the NS1 guidelines, if adopted, would not have any significant economic impact on a substantial number of small entities. The factual basis for the certification was published in the proposed action and is not repeated here. Two commenters stated that an initial regulatory flexibility analysis should be prepared, and NMFS has responded to those comments in the ''Response to Comments.'' After considering the comments, NMFS has determined that a certification is still appropriate for this action. Therefore, a regulatory flexibility analysis is not required for this action and none was prepared.

List of Subjects in 50 CFR Part 600

Fisheries, Fishing, Reporting and recordkeeping requirements.

Dated: January 9, 2009.

James W. Balsiger,

Acting Assistant Administrator, for Fisheries, National Marine Fisheries Service.

PART 600—MAGNUSON-STEVENS ACT PROVISIONS

■ 1. The authority citation for part 600 continues to read as follows:

Authority: 16 U.S.C. 1801 *et seq.*

■ 2. Section 600.310 is revised to read as follows:

§ 600.310 National Standard 1—Optimum Yield.

(a) *Standard 1.* Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery for the U.S. fishing industry.

(b) *General.* (1) The guidelines set forth in this section describe fishery management approaches to meet the objectives of National Standard 1 (NS1), and include guidance on:

(i) Specifying maximum sustainable yield (MSY) and OY;

(ii) Specifying status determination criteria (SDC) so that overfishing and overfished determinations can be made for stocks and stock complexes that are part of a fishery;

(iii) Preventing overfishing and achieving OY, incorporation of scientific and management uncertainty in control rules, and adaptive management using annual catch limits (ACL) and measures to ensure accountability (AM); and

(iv) Rebuilding stocks and stock complexes.

(2) *Overview of Magnuson-Stevens Act concepts and provisions related to NS1*—(i) *MSY.* The Magnuson-Stevens Act establishes MSY as the basis for fishery management and requires that: The fishing mortality rate does not jeopardize the capacity of a stock or stock complex to produce MSY; the abundance of an overfished stock or stock complex be rebuilt to a level that is capable of producing MSY; and OY not exceed MSY.

(ii) *OY.* The determination of OY is a decisional mechanism for resolving the Magnuson-Stevens Act's conservation and management objectives, achieving a fishery management plan's (FMP) objectives, and balancing the various interests that comprise the greatest overall benefits to the Nation. OY is based on MSY as reduced under paragraphs (e)(3)(iii) and (iv) of this section. The most important limitation on the specification of OY is that the choice of OY and the conservation and management measures proposed to achieve it must prevent overfishing.

(iii) *ACLs and AMs.* Any FMP which is prepared by any Council shall establish a mechanism for specifying ACLs in the FMP (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability (Magnuson-Stevens Act section 303(a)(15)). Subject to certain exceptions and circumstances described in paragraph (h) of this section, this requirement takes effect in fishing year 2010, for fisheries determined subject to overfishing, and in fishing year 2011, for all other fisheries (Magnuson-Stevens Act section 303 note). ''Council'' includes the Regional Fishery Management Councils and the Secretary of Commerce, as appropriate (*see* § 600.305(c)(11)).

(iv) *Reference points.* SDC, MSY, acceptable biological catch (ABC), and ACL, which are described further in paragraphs (e) and (f) of this section, are collectively referred to as ''reference points.''

(v) *Scientific advice.* The Magnuson-Stevens Act has requirements regarding scientific and statistical committees (SSC) of the Regional Fishery Management Councils, including but not limited to, the following provisions:

(A) Each Regional Fishery Management Council shall establish an SSC as described in section 302(g)(1)(A) of the Magnuson-Stevens Act.

(B) Each SSC shall provide its Regional Fishery Management Council recommendations for ABC as well as other scientific advice, as described in Magnuson-Stevens Act section 302(g)(1)(B).

(C) The Secretary and each Regional Fishery Management Council may establish a peer review process for that Council for scientific information used to advise the Council about the conservation and management of a fishery (see Magnuson-Stevens Act section 302(g)(1)(E)). If a peer review process is established, it should investigate the technical merits of stock assessments and other scientific information used by the SSC or agency or international scientists, as appropriate. For Regional Fishery Management Councils, the peer review process is not a substitute for the SSC and should work in conjunction with the SSC. For the Secretary, which does not have an SSC, the peer review process should provide the scientific information necessary.

(D) Each Council shall develop ACLs for each of its managed fisheries that may not exceed the ''fishing level recommendations'' of its SSC or peer review process (Magnuson-Stevens Act section 302(h)(6)). The SSC recommendation that is the most relevant to ACLs is ABC, as both ACL and ABC are levels of annual catch.

(3) *Approach for setting limits and accountability measures, including targets, for consistency with NS1.* In general, when specifying limits and accountability measures intended to avoid overfishing and achieve sustainable fisheries, Councils must take an approach that considers uncertainty in scientific information and management control of the fishery. These guidelines describe how to address uncertainty such that there is a low risk that limits are exceeded as described in paragraphs (f)(4) and (f)(6) of this section.

(c) *Summary of items to include in FMPs related to NS1.* This section provides a summary of items that Councils must include in their FMPs and FMP amendments in order to address ACL, AM, and other aspects of the NS1 guidelines. As described in further detail in paragraph (d) of this section, Councils may review their FMPs to decide if all stocks are ''in the fishery'' or whether some fit the category of ''ecosystem component species.'' Councils must also describe fisheries data for the stocks, stock complexes, and ecosystem component species in their FMPs, or associated public documents such as Stock Assessment and Fishery Evaluation (SAFE) Reports. For all stocks and stock complexes that are ''in the fishery'' (see paragraph (d)(2) of this section), the Councils must evaluate and describe the following items in their FMPs and amend the FMPs, if necessary, to align their management objectives to end or prevent overfishing:

(1) MSY and SDC (see paragraphs (e)(1) and (2) of this section).

(2) OY at the stock, stock complex, or fishery level and provide the OY specification analysis (see paragraph (e)(3) of this section).

(3) ABC control rule (see paragraph (f)(4) of this section).

(4) Mechanisms for specifying ACLs and possible sector-specific ACLs in relationship to the ABC (see paragraphs (f)(5) and (h) of this section).

(5) AMs (see paragraphs (g) and (h)(1) of this section).

(6) Stocks and stock complexes that have statutory exceptions from ACLs (see paragraph (h)(2) of this section) or which fall under limited circumstances which require different approaches to meet the ACL requirements (see paragraph (h)(3) of this section).

(d) *Classifying stocks in an FMP*—(1) *Introduction.* Magnuson-Stevens Act section 303(a)(2) requires that an FMP contain, among other things, a description of the species of fish involved in the fishery. The relevant Council determines which specific target stocks and/or non-target stocks to include in a fishery. This section provides that a Council may, but is not required to, use an ''ecosystem component (EC)'' species classification. As a default, all stocks in an FMP are

considered to be ''in the fishery,'' unless they are identified as EC species (see § 600.310(d)(5)) through an FMP amendment process.

(2) *Stocks in a fishery.* Stocks in a fishery may be grouped into stock complexes, as appropriate. Requirements for reference points and management measures for these stocks are described throughout these guidelines.

(3) ''Target stocks'' are stocks that fishers seek to catch for sale or personal use, including ''economic discards'' as defined under Magnuson-Stevens Act section 3(9).

(4) ''Non-target species'' and ''non-target stocks'' are fish caught incidentally during the pursuit of target stocks in a fishery, including ''regulatory discards'' as defined under Magnuson-Stevens Act section 3(38). They may or may not be retained for sale or personal use. Non-target species may be included in a fishery and, if so, they should be identified at the stock level. Some non-target species may be identified in an FMP as ecosystem component (EC) species or stocks.

(5) *Ecosystem component (EC) species.* (i) To be considered for possible classification as an EC species, the species should:

(A) Be a non-target species or non-target stock;

(B) Not be determined to be subject to overfishing, approaching overfished, or overfished;

(C) Not be likely to become subject to overfishing or overfished, according to the best available information, in the absence of conservation and management measures; and

(D) Not generally be retained for sale or personal use.

(ii) Occasional retention of the species would not, in and of itself, preclude consideration of the species under the EC classification. In addition to the general factors noted in paragraphs (d)(5)(i)(A)–(D) of this section, it is important to consider whether use of the EC species classification in a given instance is consistent with MSA conservation and management requirements.

(iii) EC species may be identified at the species or stock level, and may be grouped into complexes. EC species may, but are not required to, be included in an FMP or FMP amendment for any of the following reasons: For data collection purposes; for ecosystem considerations related to specification of OY for the associated fishery; as considerations in the development of conservation and management measures for the associated fishery; and/or to address other ecosystem issues. While EC species are not considered to be ''in the fishery,'' a Council should consider measures for the fishery to minimize bycatch and bycatch mortality of EC species consistent with National Standard 9, and to protect their associated role in the ecosystem. EC species do not require specification of reference points but should be monitored to the extent that any new pertinent scientific information becomes available (e.g., catch trends, vulnerability, etc.) to determine changes in their status or their vulnerability to the fishery. If necessary, they should be reclassified as ''in the fishery.''

(6) *Reclassification.* A Council should monitor the catch resulting from a fishery on a regular basis to determine if the stocks and species are appropriately classified in the FMP. If the criteria previously used to classify a stock or species is no longer valid, the Council should reclassify it through an FMP amendment, which documents rationale for the decision.

(7) *Stocks or species identified in more than one FMP.* If a stock is identified in more than one fishery, Councils should choose which FMP will be the primary FMP in which management objectives, SDC, the stock's overall ACL and other reference points for the stock are established. Conservation and management measures in other FMPs in which the stock is identified as part of a fishery should be consistent with the primary FMP's management objectives for the stock.

(8) *Stock complex.* ''Stock complex'' means a group of stocks that are sufficiently similar in geographic distribution, life history, and vulnerabilities to the fishery such that the impact of management actions on the stocks is similar. At the time a stock complex is established, the FMP should provide a full and explicit description of the proportional composition of each stock in the stock complex, to the extent possible. Stocks may be grouped into complexes for various reasons, including where stocks in a multispecies fishery cannot be targeted independent of one another and MSY can not be defined on a stock-by-stock basis (*see* paragraph (e)(1)(iii) of this section); where there is insufficient data to measure their status relative to SDC; or when it is not feasible for fishermen to distinguish individual stocks among their catch. The vulnerability of stocks to the fishery should be evaluated when determining if a particular stock complex should be established or reorganized, or if a particular stock should be included in a complex. Stock complexes may be comprised of: one or more indicator stocks, each of which has SDC and ACLs, and several other stocks; several stocks without an indicator stock, with SDC and an ACL for the complex as a whole; or one of more indicator stocks, each of which has SDC and management objectives, with an ACL for the complex as a whole (this situation might be applicable to some salmon species).

(9) *Indicator stocks.* An indicator stock is a stock with measurable SDC that can be used to help manage and evaluate more poorly known stocks that are in a stock complex. If an indicator stock is used to evaluate the status of a complex, it should be representative of the typical status of each stock within the complex, due to similarity in vulnerability. If the stocks within a stock complex have a wide range of vulnerability, they should be reorganized into different stock complexes that have similar vulnerabilities; otherwise the indicator stock should be chosen to represent the more vulnerable stocks within the complex. In instances where an indicator stock is less vulnerable than other members of the complex, management measures need to be more conservative so that the more vulnerable members of the complex are not at risk from the fishery. More than one indicator stock can be selected to provide more information about the status of the complex. When indicator stock(s) are used, periodic re-evaluation of available quantitative or qualitative information (e.g., catch trends, changes in vulnerability, fish health indices, etc.) is needed to determine whether a stock is subject to overfishing, or is approaching (or in) an overfished condition.

(10) *Vulnerability.* A stock's vulnerability is a combination of its productivity, which depends upon its life history characteristics, and its susceptibility to the fishery. Productivity refers to the capacity of the stock to produce MSY and to recover if the population is depleted, and susceptibility is the potential for the stock to be impacted by the fishery, which includes direct captures, as well as indirect impacts to the fishery (e.g., loss of habitat quality). Councils in consultation with their SSC, should analyze the vulnerability of stocks in stock complexes where possible.

(e) *Features of MSY, SDC, and OY.*—(1) *MSY.* Each FMP must include an estimate of MSY for the stocks and stock complexes in the fishery, as described in paragraph (d)(2) of this section).

(i) *Definitions.* (A) *MSY* is the largest long-term average catch or yield that can be taken from a stock or stock complex

under prevailing ecological, environmental conditions and fishery technological characteristics (e.g., gear selectivity), and the distribution of catch among fleets.

(B) *MSY fishing mortality rate (F_{msy})* is the fishing mortality rate that, if applied over the long term, would result in MSY.

(C) *MSY stock size (B_{msy})* means the long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate measure of the stock's reproductive potential that would be achieved by fishing at F_{msy}.

(ii) *MSY for stocks.* MSY should be estimated for each stock based on the best scientific information available (see § 600.315).

(iii) *MSY for stock complexes.* MSY should be estimated on a stock-by-stock basis whenever possible. However, where MSY cannot be estimated for each stock in a stock complex, then MSY may be estimated for one or more indicator stocks for the complex or for the complex as a whole. When indicator stocks are used, the stock complex's MSY could be listed as ''unknown,'' while noting that the complex is managed on the basis of one or more indicator stocks that do have known stock-specific MSYs, or suitable proxies, as described in paragraph (e)(1)(iv) of this section. When indicator stocks are not used, MSY, or a suitable proxy, should be calculated for the stock complex as a whole.

(iv) *Specifying MSY.* Because MSY is a long-term average, it need not be estimated annually, but it must be based on the best scientific information available (*see* § 600.315), and should be re-estimated as required by changes in long-term environmental or ecological conditions, fishery technological characteristics, or new scientific information. When data are insufficient to estimate MSY directly, Councils should adopt other measures of reproductive potential, based on the best scientific information available, that can serve as reasonable proxies for MSY, F_{msy}, and B_{msy}, to the extent possible. The MSY for a stock is influenced by its interactions with other stocks in its ecosystem and these interactions may shift as multiple stocks in an ecosystem are fished. These ecological conditions should be taken into account, to the extent possible, when specifying MSY. Ecological conditions not directly accounted for in the specification of MSY can be among the ecological factors considered when setting OY below MSY. As MSY values are estimates or are based on proxies, they will have some level of uncertainty associated with them. The degree of uncertainty in the estimates should be identified, when possible, through the stock assessment process and peer review (*see* § 600.335), and should be taken into account when specifying the ABC Control rule. Where this uncertainty cannot be directly calculated, such as when proxies are used, then a proxy for the uncertainty itself should be established based on the best scientific information, including comparison to other stocks.

(2) *Status determination criteria*—(i) *Definitions.* (A) *Status determination criteria (SDC)* mean the quantifiable factors, MFMT, OFL, and MSST, or their proxies, that are used to determine if overfishing has occurred, or if the stock or stock complex is overfished. Magnuson-Stevens Act (section 3(34)) defines both ''overfishing'' and ''overfished'' to mean a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the MSY on a continuing basis. To avoid confusion, this section clarifies that ''overfished'' relates to biomass of a stock or stock complex, and ''overfishing'' pertains to a rate or level of removal of fish from a stock or stock complex.

(B) *Overfishing* (to overfish) occurs whenever a stock or stock complex is subjected to a level of fishing mortality or annual total catch that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis.

(C) *Maximum fishing mortality threshold (MFMT)* means the level of fishing mortality (F), on an annual basis, above which overfishing is occurring. The MFMT or reasonable proxy may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential.

(D) *Overfishing limit (OFL)* means the annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish. The OFL is an estimate of the catch level above which overfishing is occurring.

(E) *Overfished.* A stock or stock complex is considered ''overfished'' when its biomass has declined below a level that jeopardizes the capacity of the stock or stock complex to produce MSY on a continuing basis.

(F) *Minimum stock size threshold (MSST)* means the level of biomass below which the stock or stock complex is considered to be overfished.

(G) *Approaching an overfished condition.* A stock or stock complex is approaching an overfished condition when it is projected that there is more than a 50 percent chance that the biomass of the stock or stock complex will decline below the MSST within two years.

(ii) *Specification of SDC and overfishing and overfished determinations.* SDC must be expressed in a way that enables the Council to monitor each stock or stock complex in the FMP, and determine annually, if possible, whether overfishing is occurring and whether the stock or stock complex is overfished. In specifying SDC, a Council must provide an analysis of how the SDC were chosen and how they relate to reproductive potential. Each FMP must specify, to the extent possible, objective and measurable SDC as follows (*see* paragraphs (e)(2)(ii)(A) and (B) of this section):

(A) *SDC to determine overfishing status.* Each FMP must describe which of the following two methods will be used for each stock or stock complex to determine an overfishing status.

(1) *Fishing mortality rate exceeds MFMT.* Exceeding the MFMT for a period of 1 year or more constitutes overfishing. The MFMT or reasonable proxy may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential.

(2) *Catch exceeds the OFL.* Should the annual catch exceed the annual OFL for 1 year or more, the stock or stock complex is considered subject to overfishing.

(B) *SDC to determine overfished status.* The MSST or reasonable proxy must be expressed in terms of spawning biomass or other measure of reproductive potential. To the extent possible, the MSST should equal whichever of the following is greater: One-half the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years, if the stock or stock complex were exploited at the MFMT specified under paragraph (e)(2)(ii)(A)(1) of this section. Should the estimated size of the stock or stock complex in a given year fall below this threshold, the stock or stock complex is considered overfished.

(iii) *Relationship of SDC to environmental change.* Some short-term environmental changes can alter the size of a stock or stock complex without affecting its long-term reproductive potential. Long-term environmental changes affect both the short-term size of the stock or stock complex and the long-term reproductive potential of the stock or stock complex.

(A) If environmental changes cause a stock or stock complex to fall below its MSST without affecting its long-term reproductive potential, fishing mortality must be constrained sufficiently to allow rebuilding within an acceptable time frame (*also see* paragraph (j)(3)(ii) of this section). SDC should not be respecified.

(B) If environmental changes affect the long-term reproductive potential of the stock or stock complex, one or more components of the SDC must be respecified. Once SDC have been respecified, fishing mortality may or may not have to be reduced, depending on the status of the stock or stock complex with respect to the new criteria.

(C) If manmade environmental changes are partially responsible for a stock or stock complex being in an overfished condition, in addition to controlling fishing mortality, Councils should recommend restoration of habitat and other ameliorative programs, to the extent possible (see also the guidelines issued pursuant to section 305(b) of the Magnuson-Stevens Act for Council actions concerning essential fish habitat).

(iv) *Secretarial approval of SDC.* Secretarial approval or disapproval of proposed SDC will be based on consideration of whether the proposal:

(A) Has sufficient scientific merit;

(B) Contains the elements described in paragraph (e)(2)(ii) of this section;

(C) Provides a basis for objective measurement of the status of the stock or stock complex against the criteria; and

(D) is operationally feasible.

(3) *Optimum yield*—(i) *Definitions*—(A) *Optimum yield (OY).* Magnuson-Stevens Act section (3)(33) defines ''optimum,'' with respect to the yield from a fishery, as the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems; that is prescribed on the basis of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factor; and, in the case of an overfished fishery, that provides for rebuilding to a level consistent with producing the MSY in such fishery. OY may be established at the stock or stock complex level, or at the fishery level.

(B) In NS1, use of the phrase ''achieving, on a continuing basis, the optimum yield from each fishery'' means producing, from each stock, stock complex, or fishery: a long-term series of catches such that the average catch is equal to the OY, overfishing is prevented, the long term average biomass is near or above B_{msy}, and overfished stocks and stock complexes are rebuilt consistent with timing and other requirements of section 304(e)(4) of the Magnuson-Stevens Act and paragraph (j) of this section.

(ii) *General.* OY is a long-term average amount of desired yield from a stock, stock complex, or fishery. An FMP must contain conservation and management measures, including ACLs and AMs, to achieve OY on a continuing basis, and provisions for information collection that are designed to determine the degree to which OY is achieved. These measures should allow for practical and effective implementation and enforcement of the management regime. The Secretary has an obligation to implement and enforce the FMP. If management measures prove unenforceable—or too restrictive, or not rigorous enough to prevent overfishing while achieving OY—they should be modified; an alternative is to reexamine the adequacy of the OY specification. Exceeding OY does not necessarily constitute overfishing. However, even if no overfishing resulted from exceeding OY, continual harvest at a level above OY would violate NS1, because OY was not achieved on a continuing basis. An FMP must contain an assessment and specification of OY, including a summary of information utilized in making such specification, consistent with requirements of section 303(a)(3) of the Magnuson-Stevens Act. A Council must identify those economic, social, and ecological factors relevant to management of a particular stock, stock complex, or fishery, and then evaluate them to determine the OY. The choice of a particular OY must be carefully documented to show that the OY selected will produce the greatest benefit to the Nation and prevent overfishing.

(iii) *Determining the greatest benefit to the Nation.* In determining the greatest benefit to the Nation, the values that should be weighed and receive serious attention when considering the economic, social, or ecological factors used in reducing MSY to obtain OY are:

(A) The benefits of food production are derived from providing seafood to consumers; maintaining an economically viable fishery together with its attendant contributions to the national, regional, and local economies; and utilizing the capacity of the Nation's fishery resources to meet nutritional needs.

(B) The benefits of recreational opportunities reflect the quality of both the recreational fishing experience and non-consumptive fishery uses such as ecotourism, fish watching, and recreational diving. Benefits also include the contribution of recreational fishing to the national, regional, and local economies and food supplies.

(C) The benefits of protection afforded to marine ecosystems are those resulting from maintaining viable populations (including those of unexploited species), maintaining adequate forage for all components of the ecosystem, maintaining evolutionary and ecological processes (e.g., disturbance regimes, hydrological processes, nutrient cycles), maintaining the evolutionary potential of species and ecosystems, and accommodating human use.

(iv) *Factors to consider in OY specification.* Because fisheries have limited capacities, any attempt to maximize the measures of benefits described in paragraph (e)(3)(iii) of this section will inevitably encounter practical constraints. OY cannot exceed MSY in any circumstance, and must take into account the need to prevent overfishing and rebuild overfished stocks and stock complexes. OY is prescribed on the basis of MSY as reduced by social, economic, and ecological factors. To the extent possible, the relevant social, economic, and ecological factors used to establish OY for a stock, stock complex, or fishery should be quantified and reviewed in historical, short-term, and long-term contexts. Even where quantification of social, economic, and ecological factors is not possible, the FMP still must address them in its OY specification. The following is a non-exhaustive list of potential considerations for each factor. An FMP must address each factor but not necessarily each example.

(A) *Social factors.* Examples are enjoyment gained from recreational fishing, avoidance of gear conflicts and resulting disputes, preservation of a way of life for fishermen and their families, and dependence of local communities on a fishery (e.g., involvement in fisheries and ability to adapt to change). Consideration may be given to fishery-related indicators (e.g., number of fishery permits, number of commercial fishing vessels, number of party and charter trips, landings, ex-vessel revenues etc.) and non-fishery related indicators (e.g., unemployment rates, percent of population below the poverty level, population density, etc.). Other factors that may be considered include the effects that past harvest levels have had on fishing communities, the cultural place of subsistence fishing, obligations under Indian treaties, proportions of affected minority and low-income groups, and worldwide nutritional needs.

(B) *Economic factors.* Examples are prudent consideration of the risk of overharvesting when a stock's size or reproductive potential is uncertain (*see* § 600.335(c)(2)(i)), satisfaction of consumer and recreational needs, and encouragement of domestic and export markets for U.S. harvested fish. Other factors that may be considered include: The value of fisheries, the level of capitalization, the decrease in cost per unit of catch afforded by an increase in stock size, the attendant increase in catch per unit of effort, alternate employment opportunities, and economic contribution to fishing communities, coastal areas, affected states, and the nation.

(C) *Ecological factors.* Examples include impacts on ecosystem component species, forage fish stocks, other fisheries, predator-prey or competitive interactions, marine mammals, threatened or endangered species, and birds. Species interactions that have not been explicitly taken into account when calculating MSY should be considered as relevant factors for setting OY below MSY. In addition, consideration should be given to managing forage stocks for higher biomass than B_{msy} to enhance and protect the marine ecosystem. Also important are ecological or environmental conditions that stress marine organisms, such as natural and manmade changes in wetlands or nursery grounds, and effects of pollutants on habitat and stocks.

(v) *Specification of OY.* The specification of OY must be consistent with paragraphs (e)(3)(i)–(iv) of this section. If the estimates of MFMT and current biomass are known with a high level of certainty and management controls can accurately limit catch then OY could be set very close to MSY, assuming no other reductions are necessary for social, economic, or ecological factors. To the degree that such MSY estimates and management controls are lacking or unavailable, OY should be set farther from MSY. If management measures cannot adequately control fishing mortality so that the specified OY can be achieved without overfishing, the Council should reevaluate the management measures and specification of OY so that the dual requirements of NS1 (preventing overfishing while achieving, on a continuing basis, OY) are met.

(A) The amount of fish that constitutes the OY should be expressed in terms of numbers or weight of fish.

(B) Either a range or a single value may be specified for OY.

(C) All catch must be counted against OY, including that resulting from bycatch, scientific research, and all fishing activities.

(D) The OY specification should be translatable into an annual numerical estimate for the purposes of establishing any total allowable level of foreign fishing (TALFF) and analyzing impacts of the management regime.

(E) The determination of OY is based on MSY, directly or through proxy. However, even where sufficient scientific data as to the biological characteristics of the stock do not exist, or where the period of exploitation or investigation has not been long enough for adequate understanding of stock dynamics, or where frequent large-scale fluctuations in stock size diminish the meaningfulness of the MSY concept, OY must still be established based on the best scientific information available.

(F) An OY established at a fishery level may not exceed the sum of the MSY values for each of the stocks or stock complexes within the fishery.

(G) There should be a mechanism in the FMP for periodic reassessment of the OY specification, so that it is responsive to changing circumstances in the fishery.

(H) Part of the OY may be held as a reserve to allow for factors such as uncertainties in estimates of stock size and domestic annual harvest (DAH). If an OY reserve is established, an adequate mechanism should be included in the FMP to permit timely release of the reserve to domestic or foreign fishermen, if necessary.

(vi) *OY and foreign fishing.* Section 201(d) of the Magnuson-Stevens Act provides that fishing by foreign nations is limited to that portion of the OY that will not be harvested by vessels of the United States. The FMP must include an assessment to address the following, as required by section 303(a)(4) of the Magnuson-Stevens Act:

(A) *DAH.* Councils and/or the Secretary must consider the capacity of, and the extent to which, U.S. vessels will harvest the OY on an annual basis. Estimating the amount that U.S. fishing vessels will actually harvest is required to determine the surplus.

(B) *Domestic annual processing (DAP).* Each FMP must assess the capacity of U.S. processors. It must also assess the amount of DAP, which is the sum of two estimates: The estimated amount of U.S. harvest that domestic processors will process, which may be based on historical performance or on surveys of the expressed intention of manufacturers to process, supported by evidence of contracts, plant expansion, or other relevant information; and the estimated amount of fish that will be harvested by domestic vessels, but not processed (*e.g.*, marketed as fresh whole fish, used for private consumption, or used for bait).

(C) *Joint venture processing (JVP).* When DAH exceeds DAP, the surplus is available for JVP.

(f) *Acceptable biological catch, annual catch limits, and annual catch targets.* The following features (see paragraphs (f)(1) through (f)(5) of this section) of acceptable biological catch and annual catch limits apply to stocks and stock complexes in the fishery (see paragraph (d)(2) of this section).

(1) *Introduction.* A control rule is a policy for establishing a limit or target fishing level that is based on the best available scientific information and is established by fishery managers in consultation with fisheries scientists. Control rules should be designed so that management actions become more conservative as biomass estimates, or other proxies, for a stock or stock complex decline and as science and management uncertainty increases. Examples of scientific uncertainty include uncertainty in the estimates of MFMT and biomass. Management uncertainty may include late catch reporting, misreporting, and underreporting of catches and is affected by a fishery's ability to control actual catch. For example, a fishery that has inseason catch data available and inseason closure authority has better management control and precision than a fishery that does not have these features.

(2) *Definitions.* (i) *Catch* is the total quantity of fish, measured in weight or numbers of fish, taken in commercial, recreational, subsistence, tribal, and other fisheries. Catch includes fish that are retained for any purpose, as well as mortality of fish that are discarded.

(ii) *Acceptable biological catch (ABC)* is a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty (see paragraph (f)(3) of this section), and should be specified based on the ABC control rule.

(iii) *ABC control rule* means a specified approach to setting the ABC for a stock or stock complex as a function of the scientific uncertainty in the estimate of OFL and any other scientific uncertainty (*see* paragraph (f)(4) of this section).

(iv) *Annual catch limit (ACL)* is the level of annual catch of a stock or stock complex that serves as the basis for invoking AMs. ACL cannot exceed the ABC, but may be divided into sector-ACLs (*see* paragraph (f)(5) of this section).

(v) *Annual catch target (ACT)* is an amount of annual catch of a stock or stock complex that is the management target of the fishery, and accounts for management uncertainty in controlling the actual catch at or below the ACL. ACTs are recommended in the system of accountability measures so that ACL is not exceeded.

(vi) *ACT control rule* means a specified approach to setting the ACT for a stock or stock complex such that the risk of exceeding the ACL due to management uncertainty is at an acceptably low level.

(3) *Specification of ABC.* ABC may not exceed OFL (see paragraph (e)(2)(i)(D) of this section). Councils should develop a process for receiving scientific information and advice used to establish ABC. This process should: Identify the body that will apply the ABC control rule (*i.e.* , calculates the ABC), and identify the review process that will evaluate the resulting ABC. The SSC must recommend the ABC to the Council. An SSC may recommend an ABC that differs from the result of the ABC control rule calculation, based on factors such as data uncertainty, recruitment variability, declining trends in population variables, and other factors, but must explain why. For Secretarial FMPs or FMP amendments, agency scientists or a peer review process would provide the scientific advice to establish ABC. For internationally-assessed stocks, an ABC as defined in these guidelines is not required if they meet the international exception (*see* paragraph (h)(2)(ii)). While the ABC is allowed to equal OFL, NMFS expects that in most cases ABC will be reduced from OFL to reduce the probability that overfishing might occur in a year. Also, *see* paragraph (f)(5) of this section for cases where a Council recommends that ACL is equal to ABC, and ABC is equal to OFL.

(i) *Expression of ABC.* ABC should be expressed in terms of catch, but may be expressed in terms of landings as long as estimates of bycatch and any other fishing mortality not accounted for in the landings are incorporated into the determination of ABC.

(ii) *ABC for overfished stocks.* For overfished stocks and stock complexes, a rebuilding ABC must be set to reflect the annual catch that is consistent with the schedule of fishing mortality rates in the rebuilding plan.

(4) *ABC control rule.* For stocks and stock complexes required to have an ABC, each Council must establish an ABC control rule based on scientific advice from its SSC. The determination of ABC should be based, when possible, on the probability that an actual catch equal to the stock's ABC would result in overfishing. This probability that overfishing will occur cannot exceed 50 percent and should be a lower value. The ABC control rule should consider reducing fishing mortality as stock size declines and may establish a stock abundance level below which fishing would not be allowed. The process of establishing an ABC control rule could also involve science advisors or the peer review process established under Magnuson-Stevens Act section 302(g)(1)(E). The ABC control rule must articulate how ABC will be set compared to the OFL based on the scientific knowledge about the stock or stock complex and the scientific uncertainty in the estimate of OFL and any other scientific uncertainty. The ABC control rule should consider uncertainty in factors such as stock assessment results, time lags in updating assessments, the degree of retrospective revision of assessment results, and projections. The control rule may be used in a tiered approach to address different levels of scientific uncertainty.

(5) *Setting the annual catch limit*—(i) *General.* ACL cannot exceed the ABC and may be set annually or on a multiyear plan basis. ACLs in coordination with AMs must prevent overfishing (see MSA section 303(a)(15)). If a Council recommends an ACL which equals ABC, and the ABC is equal to OFL, the Secretary may presume that the proposal would not prevent overfishing, in the absence of sufficient analysis and justification for the approach. A ''multiyear plan'' as referenced in section 303(a)(15) of the Magnuson-Stevens Act is a plan that establishes harvest specifications or harvest guidelines for each year of a time period greater than 1 year. A multiyear plan must include a mechanism for specifying ACLs for each year with appropriate AMs to prevent overfishing and maintain an appropriate rate of rebuilding if the stock or stock complex is in a rebuilding plan. A multiyear plan must provide that, if an ACL is exceeded for a year, then AMs are triggered for the next year consistent with paragraph (g)(3) of this section.

(ii) *Sector-ACLs.* A Council may, but is not required to, divide an ACL into sector-ACLs. ''Sector,'' for purposes of this section, means a distinct user group to which separate management strategies and separate catch quotas apply. Examples of sectors include the commercial sector, recreational sector, or various gear groups within a fishery. If the management measures for different sectors differ in the degree of management uncertainty, then sector ACLs may be necessary so that appropriate AMs can be developed for each sector. If a Council chooses to use sector ACLs, the sum of sector ACLs must not exceed the stock or stock complex level ACL. The system of ACLs and AMs designed must be effective in protecting the stock or stock complex as a whole. Even if sector-ACLs and AMs are established, additional AMs at the stock or stock complex level may be necessary.

(iii) *ACLs for State-Federal Fisheries.* For stocks or stock complexes that have harvest in state or territorial waters, FMPs and FMP amendments should include an ACL for the overall stock that may be further divided. For example, the overall ACL could be divided into a Federal-ACL and state-ACL. However, NMFS recognizes that Federal management is limited to the portion of the fishery under Federal authority (*see* paragraph (g)(5) of this section). When stocks are co-managed by Federal, state, tribal, and/or territorial fishery managers, the goal should be to develop collaborative conservation and management strategies, and scientific capacity to support such strategies (including AMs for state or territorial and Federal waters), to prevent overfishing of shared stocks and ensure their sustainability.

(6) *ACT control rule.* If ACT is specified as part of the AMs for a fishery, an ACT control rule is utilized for setting the ACT. The ACT control rule should clearly articulate how management uncertainty in the amount of catch in the fishery is accounted for in setting ACT. The objective for establishing the ACT and related AMs is that the ACL not be exceeded.

(i) *Determining management uncertainty.* Two sources of management uncertainty should be accounted for in establishing the AMs for a fishery, including the ACT control rule if utilized: Uncertainty in the ability of managers to constrain catch so the ACL is not exceeded, and uncertainty in quantifying the true catch amounts (*i.e.,* estimation errors). To determine the level of management uncertainty in controlling catch, analyses need to consider past management performance in the fishery and factors such as time lags in reported catch. Such analyses must be based on the best available scientific information from an SSC, agency scientists, or peer review process as appropriate.

(ii) *Establishing tiers and corresponding ACT control rules.* Tiers can be established based on levels of management uncertainty associated with the fishery, frequency and accuracy of catch monitoring data

available, and risks of exceeding the limit. An ACT control rule could be established for each tier and have, as appropriate, different formulas and standards used to establish the ACT.

(7) A Council may choose to use a single control rule that combines both scientific and management uncertainty and supports the ABC recommendation and establishment of ACL and if used ACT.

(g) *Accountability measures.* The following features (see paragraphs (g)(1) through (5) of this section) of accountability measures apply to those stocks and stock complexes in the fishery.

(1) *Introduction.* AMs are management controls to prevent ACLs, including sector-ACLs, from being exceeded, and to correct or mitigate overages of the ACL if they occur. AMs should address and minimize both the frequency and magnitude of overages and correct the problems that caused the overage in as short a time as possible. NMFS identifies two categories of AMs, inseason AMs and AMs for when the ACL is exceeded.

(2) *Inseason AMs.* Whenever possible, FMPs should include inseason monitoring and management measures to prevent catch from exceeding ACLs. Inseason AMs could include, but are not limited to: ACT; closure of a fishery; closure of specific areas; changes in gear; changes in trip size or bag limits; reductions in effort; or other appropriate management controls for the fishery. If final data or data components of catch are delayed, Councils should make appropriate use of preliminary data, such as landed catch, in implementing inseason AMs. FMPs should contain inseason closure authority giving NMFS the ability to close fisheries if it determines, based on data that it deems sufficiently reliable, that an ACL has been exceeded or is projected to be reached, and that closure of the fishery is necessary to prevent overfishing. For fisheries without inseason management control to prevent the ACL from being exceeded, AMs should utilize ACTs that are set below ACLs so that catches do not exceed the ACL.

(3) *AMs for when the ACL is exceeded.* On an annual basis, the Council must determine as soon as possible after the fishing year if an ACL was exceeded. If an ACL was exceeded, AMs must be triggered and implemented as soon as possible to correct the operational issue that caused the ACL overage, as well as any biological consequences to the stock or stock complex resulting from the overage when it is known. These AMs could include, among other things, modifications of inseason AMs or overage adjustments. For stocks and stock complexes in rebuilding plans, the AMs should include overage adjustments that reduce the ACLs in the next fishing year by the full amount of the overages, unless the best scientific information available shows that a reduced overage adjustment, or no adjustment, is needed to mitigate the effects of the overages. If catch exceeds the ACL for a given stock or stock complex more than once in the last four years, the system of ACLs and AMs should be re-evaluated, and modified if necessary, to improve its performance and effectiveness. A Council could choose a higher performance standard (e.g., a stock's catch should not exceed its ACL more often than once every five or six years) for a stock that is particularly vulnerable to the effects of overfishing, if the vulnerability of the stock has not already been accounted for in the ABC control rule.

(4) *AMs based on multi-year average data.* Some fisheries have highly variable annual catches and lack reliable inseason or annual data on which to base AMs. If there are insufficient data upon which to compare catch to ACL, either inseason or on an annual basis, AMs could be based on comparisons of average catch to average ACL over a three-year moving average period or, if supported by analysis, some other appropriate multi-year period. Councils should explain why basing AMs on a multi-year period is appropriate. Evaluation of the moving average catch to the average ACL must be conducted annually and AMs should be implemented if the average catch exceeds the average ACL. As a performance standard, if the average catch exceeds the average ACL for a stock or stock complex more than once in the last four years, then the system of ACLs and AMs should be re-evaluated and modified if necessary to improve its performance and effectiveness. The initial ACL and management measures may incorporate information from previous years so that AMs based on average ACLs can be applied from the first year. Alternatively, a Council could use a stepped approach where in year-1, catch is compared to the ACL for year-1; in year-2 the average catch for the past 2 years is compared to the average ACL; then in year 3 and beyond, the most recent 3 years of catch are compared to the corresponding ACLs for those years.

(5) *AMs for State-Federal Fisheries.* For stocks or stock complexes that have harvest in state or territorial waters, FMPs and FMP amendments must, at a minimum, have AMs for the portion of the fishery under Federal authority. Such AMs could include closing the EEZ when the Federal portion of the ACL is reached, or the overall stock's ACL is reached, or other measures.

(h) *Establishing ACL mechanisms and AMs in FMPs.* FMPs or FMP amendments must establish ACL mechanisms and AMs for all stocks and stock complexes in the fishery, unless paragraph (h)(2) of this section is applicable. These mechanisms should describe the annual or multiyear process by which specific ACLs, AMs, and other reference points such as OFL, and ABC will be established. If a complex has multiple indicator stocks, each indicator stock must have its own ACL; an additional ACL for the stock complex as a whole is optional. In cases where fisheries (e.g., Pacific salmon) harvest multiple indicator stocks of a single species that cannot be distinguished at the time of capture, separate ACLs for the indicator stocks are not required and the ACL can be established for the complex as a whole.

(1) In establishing ACL mechanisms and AMs, FMPs should describe:

(i) Timeframes for setting ACLs (e.g., annually or multi-year periods);

(ii) Sector-ACLs, if any (including set-asides for research or bycatch);

(iii) AMs and how AMs are triggered and what sources of data will be used (e.g., inseason data, annual catch compared to the ACL, or multi-year averaging approach); and

(iv) Sector-AMs, if there are sector-ACLs.

(2) *Exceptions from ACL and AM requirements*—(i) *Life cycle.* Section 303(a)(15) of the Magnuson-Stevens Act ''shall not apply to a fishery for species that has a life cycle of approximately 1 year unless the Secretary has determined the fishery is subject to overfishing of that species'' (as described in Magnuson-Stevens Act section 303 note). This exception applies to a stock for which the average length of time it takes for an individual to produce a reproductively active offspring is approximately 1 year and that the individual has only one breeding season in its lifetime. While exempt from the ACL and AM requirements, FMPs or FMP amendments for these stocks must have SDC, MSY, OY, ABC, and an ABC control rule.

(ii) *International fishery agreements.* Section 303(a)(15) of the Magnuson-Stevens Act applies ''unless otherwise provided for under an international agreement in which the United States participates'' (Magnuson-Stevens Act section 303 note). This exception applies to stocks or stock complexes

subject to management under an international agreement, which is defined as ''any bilateral or multilateral treaty, convention, or agreement which relates to fishing and to which the United States is a party'' (see Magnuson-Stevens Act section 3(24)). These stocks would still need to have SDC and MSY.

(3) *Flexibility in application of NS1 guidelines*. There are limited circumstances that may not fit the standard approaches to specification of reference points and management measures set forth in these guidelines. These include, among other things, conservation and management of Endangered Species Act listed species, harvests from aquaculture operations, and stocks with unusual life history characteristics (e.g., Pacific salmon, where the spawning potential for a stock is spread over a multi-year period). In these circumstances, Councils may propose alternative approaches for satisfying the NS1 requirements of the Magnuson-Stevens Act than those set forth in these guidelines. Councils must document their rationale for any alternative approaches for these limited circumstances in an FMP or FMP amendment, which will be reviewed for consistency with the Magnuson-Stevens Act.

(i) *Fisheries data*. In their FMPs, or associated public documents such as SAFE reports as appropriate, Councils must describe general data collection methods, as well as any specific data collection methods used for all stocks in the fishery, and EC species, including:

(1) Sources of fishing mortality (both landed and discarded), including commercial and recreational catch and bycatch in other fisheries;

(2) Description of the data collection and estimation methods used to quantify total catch mortality in each fishery, including information on the management tools used (i.e., logbooks, vessel monitoring systems, observer programs, landings reports, fish tickets, processor reports, dealer reports, recreational angler surveys, or other methods); the frequency with which data are collected and updated; and the scope of sampling coverage for each fishery; and

(3) Description of the methods used to compile catch data from various catch data collection methods and how those data are used to determine the relationship between total catch at a given point in time and the ACL for stocks and stock complexes that are part of a fishery.

(j) *Council actions to address overfishing and rebuilding for stocks and stock complexes in the fishery*—(1) *Notification*. The Secretary will immediately notify in writing a Regional Fishery Management Council whenever it is determined that:

(i) Overfishing is occurring;

(ii) A stock or stock complex is overfished;

(iii) A stock or stock complex is approaching an overfished condition; or

(iv) Existing remedial action taken for the purpose of ending previously identified overfishing or rebuilding a previously identified overfished stock or stock complex has not resulted in adequate progress.

(2) *Timing of actions*—(i) *If a stock or stock complex is undergoing overfishing*. FMPs or FMP amendments must establish ACL and AM mechanisms in 2010, for stocks and stock complexes determined to be subject to overfishing, and in 2011, for all other stocks and stock complexes (*see* paragraph (b)(2)(iii) of this section). To address practical implementation aspects of the FMP and FMP amendment process, paragraphs (j)(2)(i)(A) through (C) of this section clarifies the expected timing of actions.

(A) In addition to establishing ACL and AM mechanisms, the ACLs and AMs themselves must be specified in FMPs, FMP amendments, implementing regulations, or annual specifications beginning in 2010 or 2011, as appropriate.

(B) For stocks and stock complexes still determined to be subject to overfishing at the end of 2008, ACL and AM mechanisms and the ACLs and AMs themselves must be effective in fishing year 2010.

(C) For stocks and stock complexes determined to be subject to overfishing during 2009, ACL and AM mechanisms and ACLs and AMs themselves should be effective in fishing year 2010, if possible, or in fishing year 2011, at the latest.

(ii) *If a stock or stock complex is overfished or approaching an overfished condition*. (A) For notifications that a stock or stock complex is overfished or approaching an overfished condition made before July 12, 2009, a Council must prepare an FMP, FMP amendment, or proposed regulations within one year of notification. If the stock or stock complex is overfished, the purpose of the action is to specify a time period for ending overfishing and rebuilding the stock or stock complex that will be as short as possible as described under section 304(e)(4) of the Magnuson-Stevens Act. If the stock or stock complex is approaching an overfished condition, the purpose of the action is to prevent the biomass from declining below the MSST.

(B) For notifications that a stock or stock complex is overfished or approaching an overfished condition made after July 12, 2009, a Council must prepare and implement an FMP, FMP amendment, or proposed regulations within two years of notification, consistent with the requirements of section 304(e)(3) of the Magnuson-Stevens Act. Council actions should be submitted to NMFS within 15 months of notification to ensure sufficient time for the Secretary to implement the measures, if approved. If the stock or stock complex is overfished and overfishing is occurring, the rebuilding plan must end overfishing immediately and be consistent with ACL and AM requirements of the Magnuson-Stevens Act.

(3) *Overfished fishery*. (i) Where a stock or stock complex is overfished, a Council must specify a time period for rebuilding the stock or stock complex based on factors specified in Magnuson-Stevens Act section 304(e)(4). This target time for rebuilding (T_{target}) shall be as short as possible, taking into account: The status and biology of any overfished stock, the needs of fishing communities, recommendations by international organizations in which the U.S. participates, and interaction of the stock within the marine ecosystem. In addition, the time period shall not exceed 10 years, except where biology of the stock, other environmental conditions, or management measures under an international agreement to which the U.S. participates, dictate otherwise. SSCs (or agency scientists or peer review processes in the case of Secretarial actions) shall provide recommendations for achieving rebuilding targets (*see* Magnuson-Stevens Act section 302(g)(1)(B)). The above factors enter into the specification of T_{target} as follows:

(A) The ''minimum time for rebuilding a stock'' (T_{min}) means the amount of time the stock or stock complex is expected to take to rebuild to its MSY biomass level in the absence of any fishing mortality. In this context, the term ''expected'' means to have at least a 50 percent probability of attaining the B_{msy}.

(B) For scenarios under paragraph (j)(2)(ii)(A) of this section, the starting year for the T_{min} calculation is the first year that a rebuilding plan is implemented. For scenarios under paragraph (j)(2)(ii)(B) of this section, the starting year for the T_{min} calculation is 2 years after notification that a stock or stock complex is overfished or the first year that a rebuilding plan is implemented, whichever is sooner.

(C) If T_{min} for the stock or stock complex is 10 years or less, then the maximum time allowable for rebuilding (T_{max}) that stock to its B_{msy} is 10 years.

(D) If T_{min} for the stock or stock complex exceeds 10 years, then the maximum time allowable for rebuilding a stock or stock complex to its B_{msy} is T_{min} plus the length of time associated with one generation time for that stock or stock complex. ''Generation time'' is the average length of time between when an individual is born and the birth of its offspring.

(E) T_{target} shall not exceed T_{max}, and should be calculated based on the factors described in this paragraph (j)(3).

(ii) If a stock or stock complex reached the end of its rebuilding plan period and has not yet been determined to be rebuilt, then the rebuilding F should not be increased until the stock or stock complex has been demonstrated to be rebuilt. If the rebuilding plan was based on a T_{target} that was less than T_{max}, and the stock or stock complex is not rebuilt by T_{target}, rebuilding measures should be revised, if necessary, such that the stock or stock complex will be rebuilt by T_{max}. If the stock or stock complex has not rebuilt by T_{max}, then the fishing mortality rate should be maintained at $F_{rebuild}$ or 75 percent of the MFMT, whichever is less.

(iii) Council action addressing an overfished fishery must allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery.

(iv) For fisheries managed under an international agreement, Council action addressing an overfished fishery must reflect traditional participation in the fishery, relative to other nations, by fishermen of the United States.

(4) *Emergency actions and interim measures.* The Secretary, on his/her own initiative or in response to a Council request, may implement interim measures to reduce overfishing or promulgate regulations to address an emergency (Magnuson-Stevens Act section 304(e)(6) or 305(c)). In considering a Council request for action, the Secretary would consider, among other things, the need for and urgency of the action and public interest considerations, such as benefits to the stock or stock complex and impacts on participants in the fishery.

(i) These measures may remain in effect for not more than 180 days, but may be extended for an additional 186 days if the public has had an opportunity to comment on the measures and, in the case of Council-recommended measures, the Council is actively preparing an FMP, FMP amendment, or proposed regulations to address the emergency or overfishing on a permanent basis.

(ii) Often, these measures need to be implemented without prior notice and an opportunity for public comment, as it would be impracticable to provide for such processes given the need to act quickly and also contrary to the public interest to delay action. However, emergency regulations and interim measures that do not qualify for waivers or exceptions under the Administrative Procedure Act would need to follow proposed notice and comment rulemaking procedures.

(k) *International overfishing.* If the Secretary determines that a fishery is overfished or approaching a condition of being overfished due to excessive international fishing pressure, and for which there are no management measures (or no effective measures) to end overfishing under an international agreement to which the United States is a party, then the Secretary and/or the appropriate Council shall take certain actions as provided under Magnuson-Stevens Act section 304(i). The Secretary, in cooperation with the Secretary of State, must immediately take appropriate action at the international level to end the overfishing. In addition, within one year after the determination, the Secretary and/or appropriate Council shall:

(1) Develop recommendations for domestic regulations to address the relative impact of the U.S. fishing vessels on the stock. Council recommendations should be submitted to the Secretary.

(2) Develop and submit recommendations to the Secretary of State, and to the Congress, for international actions that will end overfishing in the fishery and rebuild the affected stocks, taking into account the relative impact of vessels of other nations and vessels of the United States on the relevant stock. Councils should, in consultation with the Secretary, develop recommendations that take into consideration relevant provisions of the Magnuson-Stevens Act and NS1 guidelines, including section 304(e) of the Magnuson-Stevens Act and paragraph (j)(3)(iv) of this section, and other applicable laws. For highly migratory species in the Pacific, recommendations from the Western Pacific, North Pacific, or Pacific Councils must be developed and submitted consistent with Magnuson-Stevens Reauthorization Act section 503(f), as appropriate.

(3) *Considerations for assessing ''relative impact.''* ''Relative impact'' under paragraphs (k)(1) and (2) of this section may include consideration of factors that include, but are not limited to: Domestic and international management measures already in place, management history of a given nation, estimates of a nation's landings or catch (including bycatch) in a given fishery, and estimates of a nation's mortality contributions in a given fishery. Information used to determine relative impact must be based upon the best available scientific information.

(l) *Relationship of National Standard 1 to other national standards—General.* National Standards 2 through 10 provide further requirements for conservation and management measures in FMPs, but do not alter the requirement of NS1 to prevent overfishing and rebuild overfished stocks.

(1) *National Standard 2 (see § 600.315).* Management measures and reference points to implement NS1 must be based on the best scientific information available. When data are insufficient to estimate reference points directly, Councils should develop reasonable proxies to the extent possible (*also see* paragraph (e)(1)(iv) of this section). In cases where scientific data are severely limited, effort should also be directed to identifying and gathering the needed data. SSCs should advise their Councils regarding the best scientific information available for fishery management decisions.

(2) *National Standard 3 (see § 600.320).* Reference points should generally be specified in terms of the level of stock aggregation for which the best scientific information is available (*also see* paragraph (e)(1)(iii) of this section). Also, scientific assessments must be based on the best information about the total range of the stock and potential biological structuring of the stock into biological sub-units, which may differ from the geographic units on which management is feasible.

(3) *National Standard 6 (see § 600.335).* Councils must build into the reference points and control rules appropriate consideration of risk, taking into account uncertainties in estimating harvest, stock conditions, life history parameters, or the effects of environmental factors.

(4) *National Standard 8 (see § 600.345).* National Standard 8 directs the Councils to apply economic and social factors towards sustained participation of fishing communities and to the extent practicable, minimize adverse economic impacts on such communities within the context of preventing overfishing and rebuilding overfished stocks as required under National Standard 1. Therefore, calculation of OY as reduced from MSY

should include economic and social factors, but the combination of management measures chosen to achieve the OY must principally be designed to prevent overfishing and rebuild overfished stocks.

(5) *National Standard 9 (see § 600.350).* Evaluation of stock status with respect to reference points must take into account mortality caused by bycatch. In addition, the estimation of catch should include the mortality of fish that are discarded.

(m) *Exceptions to requirements to prevent overfishing.* Exceptions to the requirement to prevent overfishing could apply under certain limited circumstances. Harvesting one stock at its optimum level may result in overfishing of another stock when the two stocks tend to be caught together (This can occur when the two stocks are part of the same fishery or if one is bycatch in the other's fishery). Before a Council may decide to allow this type of overfishing, an analysis must be performed and the analysis must contain a justification in terms of overall benefits, including a comparison of benefits under alternative management measures, and an analysis of the risk of any stock or stock complex falling below its MSST. The Council may decide to allow this type of overfishing if the fishery is not overfished and the analysis demonstrates that all of the following conditions are satisfied:

(1) Such action will result in long-term net benefits to the Nation;

(2) Mitigating measures have been considered and it has been demonstrated that a similar level of long-term net benefits cannot be achieved by modifying fleet behavior, gear selection/configuration, or other technical characteristic in a manner such that no overfishing would occur; and

(3) The resulting rate of fishing mortality will not cause any stock or stock complex to fall below its MSST more than 50 percent of the time in the long term, although it is recognized that persistent overfishing is expected to cause the affected stock to fall below its B_{msy} more than 50 percent of the time in the long term.

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SNAPPER GROUPER FRAMEWORK AS AMENDED THROUGH SNAPPER GROUPER AMENDMENT 12

I. Establish an assessment group and annual adjustments:

1. The Council will appoint an assessment group (Group) that will assess the condition of selected snapper grouper species in the management unit (including periodic economic and sociological assessments as needed) on an annually planned basis. The Group will present a report of its assessment and recommendations to the Council.

2. The Council will consider the report and recommendations of the Group and hold public hearings at a time and place of the Council's choosing to discuss the Group's report. The Council may convene the Advisory Panel and the Scientific and Statistical Committee to provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

3. If changes are needed in the maximum sustainable yield (MSY), total allowable catch (TAC), quotas, trip limits, bag limits, minimum sizes, gear restrictions, season/area closures (including spawning closures), timeframe for recovery of overfished species or fishing year, the Council will advise the Regional Director in writing of their recommendations accompanied by the Group's report (where appropriate), relevant background material, draft regulations, Regulatory Impact Review and public comments. For wreckfish and any other species under limited access, this report will be submitted each year at least 60 days prior to the start of the fishing season (currently April 16). Biomass levels and age structured analyses are to be added as they become available.

4. The Regional Director will review the Council's recommendations, supporting rationale, public comments and other relevant information. If the Regional Director concurs that the Council's recommendations are consistent with the goals and objectives of the fishery management plan, the national standards and other applicable law, the Regional Director will recommend that the Secretary publish proposed and final rules in the Federal Register of any changes for species managed under limited access prior to the fishing year, and for all other species and/or changes on such dates as may be agreed upon with the Council.

5. Should the Regional Director reject the recommendations, he will provide written reasons to the Council for the rejection, and existing regulations will remain in effect until the issue is resolved.

6. Appropriate adjustments that may be implemented by the Secretary by proposed and final rules in the Federal Register are:

a. Initial specification of MSY and subsequent adjustment of the best estimate of MSY where this information is available for a particular species.

b. Initial specification of acceptable biological catch (ABC) and subsequent adjustment of the ABC range and/or best estimate when and where this information is available for a particular species.

c. Setting TAC for a particular species. A TAC for wreckfish may not exceed 8 million pounds.

d. Modifying (or implementing for a particular species) TAC, quotas (including zero quotas), trip limits, bag limits (including zero bag limits), minimum sizes, gear restrictions (ranging from modifying current regulations to a complete prohibition) and season/area closures (including spawning closures).

e. The fishing year and spawning closure for wreckfish may not be adjusted by more than one month.

f. Authority is granted to the Regional Director to close any fishery, i.e. revert any bag limit to zero and close any commercial fishery, once a quota has been established through the procedure described above and such quota has been filled. When such action is necessary, the Regional Director will recommend that the Secretary publish a notice in the Federal Register as soon as possible.

g. Modifying (or implementing for a particular species) a timeframe for recovery of an overfished species.

h. Initial specification and subsequent adjustment of biomass levels and age structured analyses.

II. Establish a procedure to allow for rapid modification to definitions of Essential Fish Habitat (EFH); establishment of new, or modification of existing, Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs); and establishment of new, or modification of existing, Coral-Habitat Areas of Particular Concern.

This adjustment procedure will allow the Council to add or modify measures through a streamlined public review process. As such, measures that have been identified could be implemented or adjusted at any time during the year. The process is as follows:

1. The Council will call upon the Habitat and Environmental Protection Advisory Panel (Panel) for EFH-related actions and the Coral Advisory Panel for Coral-HAPC related actions. The Habitat and/or Coral Advisory Panel(s) will present a report of their assessment and recommendations to the Council.

2. The Council may take framework action one or more times during a year based on need. Such action(s) may come from the Panel report or the Council may take action based on issues/problems/information that surface separate from the Panel. The steps are as follows:

A. Habitat or Coral Advisory Panel Report - The Council will consider the report and recommendations of the Panel and hold public hearings at a time and place of the Council's choosing to discuss the Panel's report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the Panel's report and provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

B. Information separate from Panel Report - The Council will consider information that surfaces separate from the Panel. Council staff will compile the information and analyze the impacts of likely alternatives to address the particular situation. The Council staff report will be presented to the Council. A public hearing will be held at the time and place where the Council considers the Council staff report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the staff report and provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

3. If the Council determines that an addition or adjustment (e.g., in a species or species complex definition of EFH or EFH-HAPCs or a new EFH-HAPC is proposed for a species or species complex) to EFH, EFH-HAPCs, or Coral-HAPCs is necessary to meet the goals and objectives of the Habitat Plan, it will recommend, develop, and analyze appropriate action over the span of at least two Council meetings. The Council will provide the public with:

A. Advance notice of the availability of the recommendation.

B. The appropriate justifications, and biological, economic, and social analyses.

C. An opportunity to comment on the proposed adjustments prior to and at the second Council meeting.

4. After developing management actions and receiving public testimony, the Council will then submit the recommendation to the Regional Administrator. The Council's recommendation to the Regional Administrator must include supporting rationale, an analysis of impacts, and a recommendation to the Regional Administrator on whether to publish the management measure(s) as a final rule.

5. If the Council recommends that the management measures should be published as a final rule, the Council must consider at least the following factors and provide support and analysis for each factor considered:

A. Whether the availability of data on which the recommended management measures are based allows for adequate time to publish a proposed rule.

B. Whether regulations have to be in place for an entire harvest/fishing season.

C. Whether there has been adequate notice and opportunity for participation by the public and members of the affected industry in the development of the Council's recommended management measures.

D. Whether there is an immediate need to protect the resource.

E. Whether there will be a continuing evaluation of management measures adopted following their promulgation as a final rule.

6. If, after reviewing the Council's recommendation and supporting information based on the FMP and the administrative record:

A. The Regional Administrator concurs with the Council's recommended management measures and determines that the recommended management measures may be published as a final rule then the action will be published in the Federal Register as a final rule; or

B. The Regional Administrator concurs with the Council's recommendation and determines that the recommended measures should be published first as a proposed rule, the action will be published as a proposed rule in the Federal Register. After additional public comment, if the Regional Administrator concurs with the Council recommendation, the action will be published as a final rule in the Federal Register; or

C. The Regional Administrator does not concur, the Council will be notified, in writing, of the reason for non-concurrence and recommendations to address those concerns.

7. Appropriate adjustments that may be implemented by the Secretary by proposed and final rules in the Federal Register are:

A. Definition of or modification of a current definition of Essential Fish Habitat for a managed species or species complex.

B. Establishment of or modification of EFH-HAPCs for managed species or species complex.

C. Establishment of or modifications of Coral-HAPCs.

D. Description, identification, and regulations of fishing activities to protect EFH and EFH-HAPCs.

E. Management measures to reduce or eliminate the adverse effects of fishing activities or fishing gear on EFH or EFH-HAPCs.

F. Regulations of EFH-HAPCs.

History of snapper grouper framework.

From Snapper Grouper Amendment 12:
Appendix G. Snapper Grouper Framework.
Snapper Grouper Amendment 4 (1991) established the following framework:
C. ASSESSMENT GROUP & ANNUAL ADJUSTMENTS
ACTION 5: ASSESSMENT GROUP & ANNUAL ADJUSTMENTS
Establish an assessment group and annual adjustments:

1. The Council will appoint an assessment group (Group) that will assess the condition of selected snapper grouper species in the management unit (including periodic economic and sociological assessments as needed) on an annually planned basis. The Group will present a report of its assessment and recommendations to the Council.

2. The Council will consider the report and recommendations of the Group and hold public hearings at a time and place of the Council's choosing to discuss the Group's report. The Council may convene the Advisory Panel and the Scientific and Statistical Committee to provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

3. If changes are needed in the maximum sustainable yield (MSY), total allowable catch (TAC), quotas, trip limits, bag limits, minimum sizes, gear restrictions, season/area closures (including spawning closures), timeframe for recovery of overfished species or fishing year, the Council will advise the Regional Director in writing of their recommendations accompanied by the Group's report, relevant background material, draft regulations, Regulatory Impact Review and public comments. This report will be submitted each year at least 60 days prior to the start of the fishing season (currently April 16).

4. The Regional Director will review the Council's recommendations, supporting rationale, public comments and other relevant information. If the Regional Director concurs that the Council's recommendations are consistent with the goals and objectives of the fishery management plan, the national standards and other applicable law, the Regional Director will recommend that the Secretary publish proposed and final rules in the Federal Register of any changes prior to the appropriate fishing season (currently April 16).

5. Should the Regional Director reject the recommendations, he will provide written reasons to the Council for the rejection, and existing regulations will remain in effect until the issue is resolved.

6. Appropriate adjustments that may be implemented by the Secretary by proposed and final rules in the Federal Register are:

a. Initial specification of MSY and subsequent adjustment of the best estimate of MSY where this information is available for a particular species.

b. Initial specification of acceptable biological catch (ABC) and subsequent adjustment of the ABC range and/or best estimate when and where this information is available for a particular species.

c. Setting TAC for a particular species. A TAC for wreckfish may not exceed 8 million pounds.

d. Modifying (or implementing for a particular species) TAC, quotas (including zero quotas), trip limits, bag limits (including zero bag limits), minimum sizes, gear restrictions (ranging from modifying current regulations to a complete prohibition) and season/area closures (including spawning closures).

e. The fishing year and spawning closure for wreckfish may not be adjusted by more than one month.

f. Authority is granted to the Regional Director to close any fishery, i.e. revert any bag limit to zero and close any commercial fishery, once a quota has been established through the procedure described above and such quota has been filled. When such action is necessary, the Regional Director will recommend that the Secretary publish a notice in the Federal Register as soon as possible.

g. Modifying (or implementing for a particular species) a timeframe for recovery of an overfished species.

Discussion

The procedure described above will allow for regular stock assessments and provide for timely adjustments to the management program to prevent overfishing and/or rebuild a stock if overfished. It is the Council's intent that all species in the management unit receive periodic assessments. Council staff and the assessment group will select species to be assessed and include those in the annual NMFS/Council planning process (called Operations Plans).

It is the Council's intent that TAC be limited by the upper end of an acceptable biological catch (ABC) range when and if one is provided; however, no limits should be placed on the lower limit of TAC so that a zero TAC could be specified if deemed necessary to protect the resource.

Snapper Grouper Amendment 7 (1994) modified the framework:
ACTION 14. MODIFY THE FRAMEWORK PROCEDURE
Modify the framework (wording included under discussion below) by inserting "where Appropriate" after "report" in **(3):** "...accompanied by the Group's report (where appropriate) ..." Modify the last sentence in **(3)** to read: "For wreckfish and any other species under limited access, this report will be submitted each year at least 60 days prior to the start of the fishing season; for all other species and/or changes, this report will be submitted by any such date as may be specified by the Council but at least 60 days prior to the desired effective date." Also, modify the last sentence in **(4)** to read: "...changes for species managed under limited access prior to the fishing year, and for all other species and/or changes on such dates as may be agreed upon with the Council."

Biological Impacts
The framework established in Amendment 4 has been interpreted to allow preseason changes for wreckfish prior to the April 16 start of the fishing season, and for all other species and/or changes prior to January 1. The alternatives discussed below will explore retaining the preseason timeframe for wreckfish but allow other changes as needed during the year.

Amendment 4 (SAFMC, 1991a; page 22) discusses the assessment group and annual adjustments. The wording currently in place is as follows:
"3. If changes are needed in the maximum sustainable yield (MSY), total allowable catch (TAC), quotas, trip limits, bag limits, minimum sizes, gear restrictions, seasonlarea closures (including spawning closures), timeframe for recovery of overfished species or fishing year, the Council will advise the Regional Director in writing of their recommendations accompanied by the Group's report, relevant background material, draft regulations, Regulatory Impact Review and public comments. This report will be submitted each year at least 60 days prior to the start of the fishing season (currently April 16).
4. The Regional Director will review the Council's recommendations, supporting rationale, public comments and other relevant information. If the Regional Director concurs that the Council's recommendations are consistent with the goals and objectives of the fishery management plan, the national standards and other applicable law, the Regional Director will recommend that the Secretary publish proposed and final rules in the Federal Register of any changes prior to the appropriate fishing season (currently April 16)".

It is the Council's intent to make most changes prior to the appropriate fishing year (April 16 for wreckfish and January 1 for all other species). However, instances may arise that require action during the fishing year and may not require/allow for a report from the assessment group. This option would allow the Council to take appropriate action that would benefit the resource or the resource users without having to rely on emergency action. If this wording was in Amendment 4, the recent black sea bass pot changes would not have required emergency action. The NMFS Washington Office has made it clear that the Councils are to develop framework provisions that reduce the necessity of requesting emergency action. This change to "any such date as may be specified by the Council" tracks the mackerel framework.

This option would allow for an in-season adjustment to the quota for species managed under an open access quota management program. However, for species under a limited access management program, modifications to the quotas would be pre-season adjustments.

The SAFMC Comprehensive SFA Amendment modified the framework:
4.3.4.2 Framework Adjustment Procedures.
ACTION 6. Add a provision to all framework procedures in all Council FMPs that allows the addition of biomass levels and age structured analyses as they become available.

Discussion
Data are not available to allow the Council to specify biomass levels for the overfished levels. This provision will allow the Council to add specification of biomass levels and/or age structured analyses to address the overfished component of the status determination criteria. Making these adjustments through the framework procedure should
be faster than requiring a full plan amendment.

The SAFMC Comprehensive Habitat Amendment added a habitat procedure to the framework in all SAFMC FMPs with a framework:
4.2.8 Mechanism for Determination of Framework Adjustments/Framework Procedure and Activities Authorized by the Secretary of Commerce.
Establish a procedure to allow for rapid modification to definitions of Essential Fish Habitat (EFH); establishment of new, or modification of existing, Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs); and establishment of new, or modification of existing, Coral-Habitat Areas of Particular Concern. This adjustment procedure will allow the Council to add or modify measures through a streamlined public review process. As such, measures that have been identified could be implemented or
adjusted at any time during the year. The process is as follows:

1. The Council will call upon the Habitat and Environmental Protection Advisory Panel (Panel) for EFH-related actions and the Coral Advisory Panel for Coral-HAPC related actions. The Habitat and/or Coral Advisory Panel(s) will present a report of their assessment and recommendations to the Council.
2. The Council may take framework action one or more times during a year based on need. Such action(s) may come from the Panel report or the Council may take action based on issues/problems/information that surface separate from the Panel. The steps are as follows:
   A. Habitat or Coral Advisory Panel Report - The Council will consider the report and recommendations of the Panel and hold public hearings at a time and place of the Council's choosing to discuss the Panel's report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the Panel's report and provide
   advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.
   B. Information separate from Panel Report - The Council will consider information that surfaces separate from the Panel. Council staff will compile the information and

analyze the impacts of likely alternatives to address the particular situation. The Council staff report will be presented to the Council. A public hearing will be held at the time and place where the Council considers the Council staff report. The Council will consult the Advisory Panel(s) and the Scientific and Statistical Committee to review the staff report and provide advice prior to taking final action. After receiving public input, the Council will make findings on the need for changes.

3. If the Council determines that an addition or adjustment (e.g., in a species or species complex definition of EFH or EFH-HAPCs or a new EFH-HAPC is proposed for a species or species complex) to EFH, EFH-HAPCs, or Coral-HAPCs is necessary to meet the goals and objectives of the Habitat Plan, it will recommend, develop, and analyze appropriate action over the span of at least two Council meetings. The Council will provide the public with:

A. Advance notice of the availability of the recommendation.

B. The appropriate justifications, and biological, economic, and social analyses.

C. An opportunity to comment on the proposed adjustments prior to and at the second Council meeting.

4. After developing management actions and receiving public testimony, the Council will then submit the recommendation to the Regional Administrator. The Council's recommendation to the Regional Administrator must include supporting rationale, an analysis of impacts, and a recommendation to the Regional Administrator on whether to publish the management measure(s) as a final rule.

5. If the Council recommends that the management measures should be published as a final rule, the Council must consider at least the following factors and provide support and analysis for each factor considered:

A. Whether the availability of data on which the recommended management measures are based allows for adequate time to publish a proposed rule.

B. Whether regulations have to be in place for an entire harvest/fishing season.

C. Whether there has been adequate notice and opportunity for participation by the public and members of the affected industry in the development of the Council's recommended management measures.

D. Whether there is an immediate need to protect the resource.

E. Whether there will be a continuing evaluation of management measures adopted following their promulgation as a final rule.

6. If, after reviewing the Council's recommendation and supporting information based on the FMP and the administrative record:

A. The Regional Administrator concurs with the Council's recommended management measures and determines that the recommended management measures may be published as a final rule then the action will be published in the Federal Register as a final rule; or

B. The Regional Administrator concurs with the Council's recommendation and determines that the recommended measures should be published first as a proposed rule, the action will be published as a proposed rule in the Federal Register. After additional public comment, if the Regional Administrator concurs with the Council recommendation, the action will be published as a final rule in the Federal Register; or

C. The Regional Administrator does not concur, the Council will be notified, in writing, of the reason for non-concurrence and recommendations to address those concerns.

7. Appropriate adjustments that may be implemented by the Secretary by proposed and final rules in the Federal Register are:

A. Definition of or modification of a current definition of Essential Fish Habitat for a managed species or species complex.

B. Establishment of or modification of EFH-HAPCs for managed species or species complex.

C. Establishment of or modifications of Coral-HAPCs.

The procedure described above will provide for timely adjustments to definitions of Essential Fish Habitat (EFH); establishment of new, or modification of existing, Essential Fish Habitat-Habitat Areas of Particular Concern (EFH-HAPCs); and establishment of new, or modification of existing, Coral-Habitat Areas of Particular Concern. It is the Council's intent that definitions of EFH and the establishment of new or modification of existing EFH-HAPCs or Coral-HAPCs be periodically assessed. Reviews would occur as sufficient information becomes available such that the Panel, the species Advisory Panel, the Scientific and Statistical Committee, and the Council feel confident in the recommendations. Complete reviews will be conducted as needed. Council staff and NMFS will specify such reviews in the annual NMFS/Council planning process (called operations plans).

Snapper Grouper Amendment 12 modified:

4.2.5 ACTION 5. Modify the Snapper Grouper Framework by adding the following list of management options and measures that could be implemented via framework action:

A. Description, identification, and regulations of fishing activities to protect EFH and EFH-HAPCs.

B. Management measures to reduce or eliminate the adverse effects of fishing activities or fishing gear on EFH or EFH-HAPCs.

C. Regulations of EFH-HAPCs.

Amendment 17B Scoping Summary

I. Summary

The South Atlantic Fishery Management Council (Council) and NOAA Fisheries Service solicited comments on actions to establish annual catch limits (ACLs) and accountability measures (AMs) for South Atlantic fish species subject to overfishing. A notice of intent to prepare a draft environmental impact statement was published January 22, 2008 [73 FR 3701]. Four public scoping meetings were held in February 2008. The table below outlines the attendance at each meeting. The Council received 320 written correspondences in the form of letters, faxes, and e-mails. Of those written comments 309 were signatures on one form letter submitted several times. The document represents a general overview of the comments received from commercial and recreational fishermen, and two environmental organizations. Some comments submitted for this round of scoping relate to issues addressed in Amendment 17A to the Fishery Management Plan for the Snapper Grouper Fishery of the South Atlantic Region. Those comments are summarized in the Scoping Summary provided as Appendix P of Amendment 17A. This scoping summary is not intended to provide a detailed report of all the comments and viewpoints received. Copies of the written comments and the scoping minutes may be found on line at: http://safmc.net/Meetings/CouncilMeetings/March372008CouncilMeeting/BriefingBookMarch372008/tabid/548/Default.aspx.

Date	Location	Attendance
2/4/2008	Coconut Grove, FL	15
2/5/2008	Cape Canaveral,	40
2/6/2008	Brunswick, GA	13
2/7/2008	New Burn, NC	16

II. Summary of Comments

The majority of written comments and verbal testimonies were against further harvest restrictions for species that would be affected by Amendment 17B. Specifically, many recreational fishermen signed a form letter expressing opposition to any allocations or harvest restrictions that they feel would negatively impact the recreational sector. The form letter indicated that the commercial sector is responsible for the majority of harvest of the species in question and therefore, should be the sector most restricted in terms of harvest and allocations. Other comments referenced a lack of enforcement of current regulations. Those same commenters suggested increasing enforcement efforts of those regulations already in place before adding more restrictive management measures.

One environmental organization urged the Council to find a method to account for and preserve forage fish species as food for other species, and stated that currently, target species are treated independently from their relationship to the rest of the ecosystem. Some public testimony also supported the ecosystem approach to establishing ACLs. The same organization also requested that ACLs for data poor species or species with unknown status be set at more precautionary levels than what is suggested by current NOAA Fisheries Service guidance. Another environmental organization suggested that ACLs should consist of a risk-based assessment of species in the South Atlantic FMPs. The risk-based assessments could then be compared to results of the stock assessments to assess the applicability of the risk-based assessments to provide an adequate buffer between the ABC and the ACL. Following the completion of this ground-truthing of the methodology, NOAA Fisheries Service could further develop the risk-assessment concept into a methodology for setting ACLs, with appropriate buffers, for data-poor species. The same organization also suggested that AMs: 1) Account for the entire amount of an overage as well as compensate for any lost productivity due to the foregone spawning potential caused by the overage; 2) be implemented in a precautionary way during the fishing season; 3) be instituted no later than the following fishing year if in-season management is not immediately possible; and 4) apply on a sector-by-sector basis.

Several commenters stated that there are already too many regulations to keep track of and fisheries managers have not given them enough time to see if they are working to end overfishing. Others stated that reductions in biomass are not only attributable to directed fishing but also to non-point source pollution and global warming, which is not regulated by NOAA Fisheries Service. Several commenters address snowy grouper issues specifically and felt that there should be no size limit on snowy grouper in order to reduce fishing mortality because they are throwing back many dead fish. Several commenters also suggested that the Council consider establishing more artificial reef areas to help rebuild fish stocks in the South Atlantic. Some commenters felt that snowy grouper are caught at similar levels in the recreational and commercial sectors and therefore, both sectors should be heavily restricted.

Some who spoke during public testimony mentioned that there is illegal bottom longlining taking place inside of the 50 fathom depth contour. These same people felt that enforcing the longliners would help current regulations achieve what they were created to do. Others spoke about advantages of allowing retention of speckled hind and warsaw grouper because of the high mortality rate associated with throwing back regulatory discards of these species. Several commenters also expressed concern over the ability of MRFSS to accurately track recreational landings, and other questioned proposed allocations as not being fair and equitable. One commenter, a diver from Georgia, claimed to be seeing high densities of various snapper grouper species, and implied that fisheries off the coasts of Florida and Georgia are very different and should therefore, be managed differently. The same commenter, like several others, also suggested that regional or state management would better meet the specific needs of fisheries off the coasts of individual states rather than managing snapper grouper as a unit from North Carolina to Florida. Several fishermen also

offered testimony requesting more and updated data for various species, and expressed an overall mistrust of data currently being used to manage snapper grouper species in the South Atlantic. No issues of environmental justice were raised during the four scoping meetings summarized above.

Updated Economic Analysis of Proposed Management Alternatives in Amendment 17B for the Commercial Snapper-Grouper Fishery

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October 5, 2009

Updated Economic Analysis of Proposed Management Alternatives in Amendment 17B for the Commercial Snapper-Grouper Fishery

Introduction

Amendment 17B to the snapper-grouper fishery management plan establishes annual catch limits for the commercial and/or recreational sectors for nine species in the management unit for which overfishing is occurring. These species are vermilion snapper (*Rhomboplites aurorubens*), gag (*Mycteroperca microlepis*), black grouper (*M. bonaci*), red grouper (*Epinephelus morio*), snowy grouper (*E. niveatus*), speckled hind (*E. drummondhayi*), warsaw grouper (*E. nigritus*), (golden) tilefish (*Lopholatilus chamaeleonticeps*) and black sea bass (*Centropristis striata*).

This report uses a simulation model to examine the economic effects of proposed commercial catch limits for: (a) speckled hind and warsaw grouper; (b) tilefish; and (c) red grouper and black grouper. Catch limits for vermilion snapper and gag were established in Amendment 16 for the commercial fishery, and in Amendment 13C for snowy grouper and black sea bass. This report includes results for new and revised management alternatives that were proposed at the September meeting of the South Atlantic Fishery Management Council (hereafter referred to as the Council). These results are preliminary and could change if the proposed management alternatives evolve during the development of Amendment 17B.

Method of Analyzing Economic Effects of Proposed Management Alternatives

Fishermen with permits to fish in federal waters for species in the snapper-grouper fishery have been required since 1993 to submit trip reports of their landings by species. Logbook trip reports from 2005-2008 constitute the source of data used in this analysis. Data prior to 2005 were not used in the analysis because they did not include information about the depth of water where fish were caught. One of the proposed alternatives in Amendment 17B would regulate fishing activity by water depth.

The simulation model uses logbook trip reports to predict the short-term economic effects of proposed management alternatives. The general method of analysis is to hypothetically impose proposed regulations on individual fishing trips as reported to the logbook database, and then calculate their effects on trip catches, revenues and costs. Trip-level results are totaled by year for 2005-2008, and the four-year average of simulated results is interpreted as the expected annual outcome of proposed regulations. The four-year average is used so that short-term anomalies that may have affected fishing success in any one year will be averaged out. The average annual simulated fishing incomes net of trip costs (also referred to as *net operating revenues*) for the proposed alternatives are compared to the no-action alternative to estimate the expected economic effects on commercial fishermen.

Net operating revenues for trip j in year t were calculated as trip revenues from all species minus predicted trip costs, which include fuel, oil, bait, ice, and other supplies, and exclude fixed costs

and labor costs. Therefore, net operating revenues represent the return to fixed factors of production, boat owner and crew. Net operating revenues were adjusted to constant 2008 dollars with the consumer price index for all items and all urban consumers.

The simulation model examines the effects of proposed management alternatives on trip revenues and trip costs. If trip revenues remain greater than trip costs plus opportunity cost of labor after accounting for the likely effects of proposed restrictions, then the trip is recorded as taken in the simulation model, and the economic effect of the proposed restriction is measured as the loss in revenues associated with the expected reduction in landings per trip. On the other hand, if the proposed alternatives would cause trip revenues to fall below the sum of trip costs and opportunity cost for labor after accounting for the likely effects of proposed restrictions on trip-level harvests, then the trip is recorded as not taken in the simulation model, and losses are measured as a reduction in net operating revenues, which included the loss in revenues from all species minus the savings of trip costs not incurred.

This method of analysis has advantages and disadvantages. The advantages are that logbook data are reported by fishermen, and are available in sufficient detail to analyze and compare the proposed alternatives. The disadvantage is that logbook data reflect fishing patterns and strategies given regulations that will no longer apply. Fishermen will modify their fishing patterns and strategies to minimize the effects of new regulations, but the simulation model does not account for these changes. Therefore, it can only approximate the true, but unknown, outcomes of proposed regulations. Nevertheless, the approach provides useful insights about the relative magnitudes of change due to proposed alternatives and the distribution of effects among subgroups within the fishery.

The No-Action Alternative

The objective of this analysis is to predict the extra economic effects associated with implementation of Amendment 17B. It accomplishes this objective by comparing the predicted outcomes of simulations given proposed regulations for Amendment 17B with the predicted outcome of simulations for the no-action alternative. For purposes of this analysis, the no-action alternative is defined by the predicted outcomes of rules specified in Amendments 13C and 16.

The effects of proposed regulations in Amendment 17B are compared to the simulated effects of Amendments 13C and 16 rather than to observed fishery landings and revenues because historical data for 2005-2008 do not reflect the effects of regulations recently implemented by these amendments. Amendment 13C to the Snapper-Grouper Fishery Management Plan was implemented in October 2006, and primarily regulates the harvest of deep water groupers, tilefish and black sea bass. Amendment 16 was implemented at the end of July 2009 and imposes limits on the harvest of vermilion snapper, gag and other shallow water groupers. Landings of other species, such as red snapper, in the snapper-grouper management unit could change if they are indirectly affected by regulations in Amendments 13C and 16.

Figure 1. Predicted percentage change in pounds landed compared to the No-Action alternative for Amendment 13C after accounting for the expected effects of regulations implemented by Amendments 13C and 16.

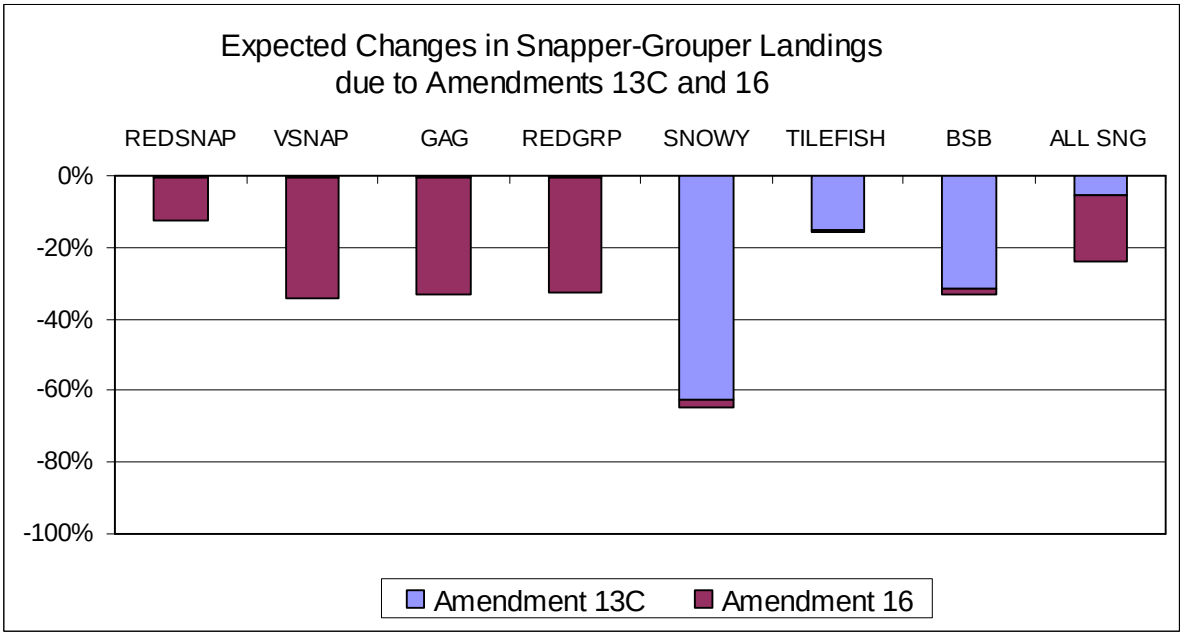


Figure 1 illustrates the differences between the simulated fishery landings for the regulatory period prior to Amendment 13C and the simulated landings that comprise the no-action alternative for Amendment 17B. The light shading in Figure 1 illustrates that Amendment 13C is expected to affect landings of snowy grouper, golden tilefish and black sea bass. The dark shading in Figure 1 illustrates that Amendment 16 is expected to affect landings of mid-shelf species such as vermilion snapper, gag and red grouper, and to a lesser extent, red snapper. The cumulative effects on landings are illustrated by the total length of each bar in Figure 1. Amendments 13C and 16 are predicted to reduce landings of: red snapper by approximately 13 percent; vermilion snapper and black sea bass by approximately 34 percent; gag and red grouper by approximately 33 percent; snowy grouper by approximately 65 percent; and (golden) tilefish by approximately 15 percent. The right-most bar in Figure 1 (labeled ALL SNG) illustrates that Amendments 13C and 16 are expected to reduce the aggregate landings of all species (including species not shown in Figure 1) in the snapper-grouper management unit by approximately 25 percent compared to expected annual landings for the regulatory environment prior to Amendment 13C.

Management Alternatives for Speckled Hind and Warsaw Grouper

Speckled hind and warsaw grouper are relatively rare, and all proposed alternatives in this Action would prohibit their harvest, possession and sale. The alternatives differ in their restrictions on the harvest of other species so as to reduce the incidental catch and discard of speckled hind and warsaw grouper. Alternative 5 was added at the Council meeting in September 2009. Alternative 4 is the Council's preferred alternative. See Table 1.

Table 1. Proposed alternatives in Amendment 17B for the management of speckled hind and warsaw grouper. (Table 1 paraphrases rather than includes a verbatim statement of alternatives from Amendment 17B.)

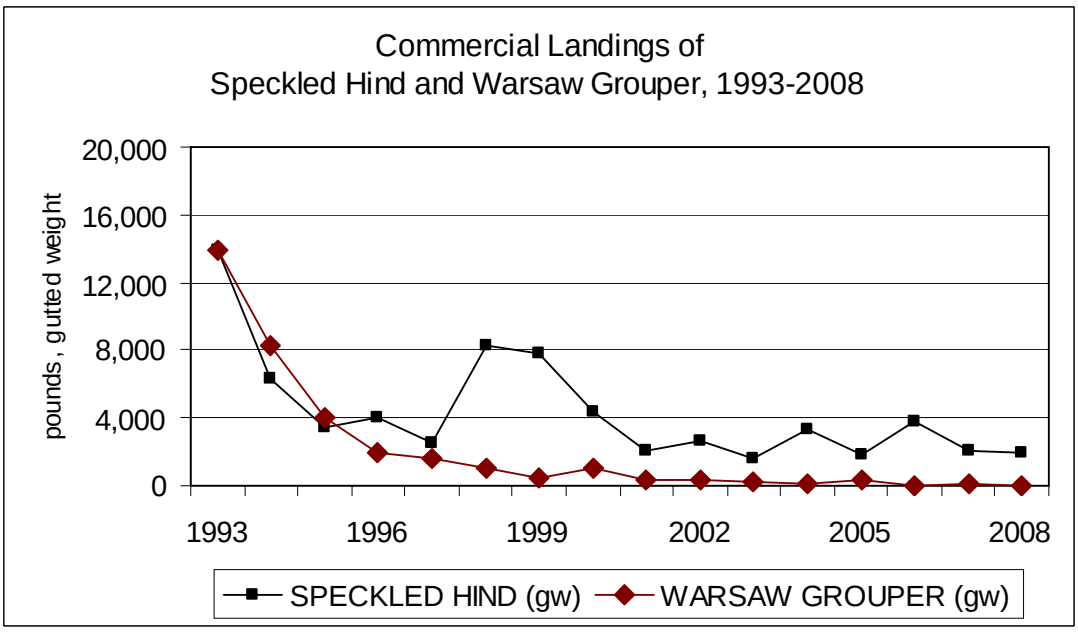
Model Name	*Description*
A17b_NO_ACTION	*Alternative 1*: No Action. Retain existing regulations for speckled hind and warsaw grouper. Prohibit purchase and sale of speckled hind and warsaw grouper. Allow one speckled hind and one warsaw grouper per vessel per trip as part of the 3-fish recreational bag limit for groupers.
A17b_SpHind_ALT2	*Alternative 2*: Establish an ACL = 0 for speckled hind and warsaw grouper. Prohibit all commercial and recreational fishing for, possession, and retention of speckled hind and warsaw grouper.
A17b_SpHind_ALT3	*Alternative 3*: Establish an ACL = 0 for speckled hind and warsaw grouper. Prohibit all commercial and recreational fishing for, possession, and retention of the following deepwater species: speckled hind, warsaw grouper, snowy grouper, yellowedge grouper, misty grouper, blueline tilefish, queen snapper, and silk snapper.
A17b_SpHind_ALT4**	*Alternative 4 (Preferred)*: Establish an ACL = 0 for speckled hind and warsaw grouper. Prohibit all commercial and recreational fishing for, possession, and retention of speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of snowy grouper, yellowedge grouper, misty grouper, blueline tilefish, queen snapper, and silk snapper beyond a depth of 240 feet (40 fathoms; 73 m).
A17b_SpHind_ALT5	*Alternative 5:* Establish an ACL = 0 for speckled hind and warsaw grouper. Prohibit all commercial and recreational fishing for, possession, and retention of speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of snowy grouper, yellowedge grouper, misty grouper, blueline tilefish, queen snapper, and silk snapper) beyond a depth of 300 feet (50 fathoms; 92 m).

** denotes the Council's preferred alternative.

In 1993, commercial fishermen landed 13,900 pounds (gutted weight) of speckled hind and 14,000 pounds of warsaw grouper on fishing trips in federal waters, as recorded in the logbook

database (Figure 2). Landings of both species have declined since then, as Amendment 6 to the Snapper-Grouper FMP prohibited their sale in mid-1994. There is a one fish possession limit for each species since these deep water groupers probably would not survive if released after being caught.

Figure 2. Commercial landings in federal waters: speckled hind and warsaw grouper, 1993-2008.



Source: SEFSC logbook database as of June 29, 2009.

Alternative 1 (i.e., No Action) is the least restrictive management choice because it allows one fish per vessel per trip to be retained as part of the recreational aggregate bag limit for groupers. Despite the existing no-sale provision, small quantities of both species are reported. On average for 2005-2008, commercial fishermen on trips in federal waters landed 2,400 pounds (gutted weight) of speckled hind worth approximately $6,400 and 100 pounds of warsaw grouper worth $260.[1]

Alternative 2 differs from the no-action alternative in that the one fish possession limit would be eliminated. Because of the existing no-sale provision, few speckled hind or warsaw grouper are landed. Hence, the economic effect of Alternative 2 is expected to be small. The simulation analysis predicts an average annual loss of approximately $6,000, or about one-tenth of one percent of predicted net operating revenues for the commercial fishery with the no-action alternative for Amendment 17B.[2] The expected reduction in net operating revenues is less than the average annual dockside value of speckled hind and warsaw grouper landed during 2005-

[1] The logbook database does not collect prices or revenues for landed fish. Trip revenues were approximated as reported landings multiplied by average prices, by species, from the NMFS Accumulated Landings System.
[2] The commercial fishery is defined in this analysis as consisting of all trips in the logbook database that reported landing at least one pound of any species in the snapper-grouper management unit.

2008 because the no-action alternative for Amendment 17B includes the expected reductions in landings due to Amendments 13C and 16.

Alternative 3 is the most restrictive management choice because it prohibits the harvest and sale of all major deepwater species in the snapper-grouper management unit, including snowy grouper, yellowedge grouper, blueline tilefish, silk snapper and other species. Overall, Alternative 3 is expected to reduce net operating revenues in the snapper-grouper fishery by approximately $365,000, or by 4.2 percent compared to the no-action alternative (Figures 3a and 3b). The effects of this alternative are expected to be incurred primarily by boats that fish with vertical lines (Figure 3a), although boats with longlines would incur greater losses in percentage terms (Figure 3b) because Alternative 3 would prohibit the harvest of snowy grouper and yellowedge grouper. Vessels that use bottom longline gear are expected to incur losses that average approximately 12.2 percent of base net operating revenues. Boats in North Carolina and the Florida Keys would incur the greatest reductions in net operating revenues (Figures 4a and 4b), primarily due to the prohibition on the harvest of snowy grouper and blueline tilefish. Net operating revenues for boats in North Carolina are predicted to decline by an average of 8.7 percent per year, while net operating revenues for boats in the Keys are predicted to decline by approximately 4.2 percent per year compared to the no-action alternative.

Alternative 4 is less restrictive than Alternative 3 because it excludes from the prohibition the harvest of deep water species in waters shallower than 240 feet. However, it is only slightly less restrictive because most deepwater species are landed in waters of 240 feet or deeper. Overall, Alternative 4 is expected to reduce net operating revenues in the snapper-grouper fishery by about $292,000 or by 3.3 percent (Figures 3a and 3b). The effects of this alternative are expected to be slightly smaller than those of Alternative 3. The expected reductions in net operating revenues would be incurred primarily by boats that fish with vertical lines (Figure 3a), although boats with longlines would incur greater losses in percentage terms (Figure 3b). Vessels that use bottom longline gear are expected to incur losses that average approximately 11.5 percent of base net operating revenues. Net operating revenues for boats in North Carolina are predicted to decline by an average of 7.2 percent per year, while net operating revenues for boats in the Keys are predicted to decline by approximately 3.9 percent per year compared to the no-action alternative.

Alternative 5 is less restrictive than Alternative 4 because it excludes from the prohibition the harvest of deep water species in waters shallower than 300 feet. Overall, Alternative 5 is expected to reduce net operating revenues in the snapper-grouper fishery by about $225,000 or by 2.6 percent (Figures 3a and 3b). The effects of Alternative 5 by gear (Figures 3a and 3b) and state (Figures 4a and 4b) are expected to be smaller than those of Alternatives 3 and 4. Vessels that use bottom longline gear are expected to incur losses that average approximately 8.2 percent of base net operating revenues. Net operating revenues for boats in North Carolina are predicted to decline by an average of 4.9 percent per year, while net operating revenues for boats in the Keys are predicted to decline by approximately 3.6 percent per year compared to the no-action alternative.

*Figure 3a. Predicted change in commercial net operating revenues by gear type for speckled hind-warsaw grouper alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*

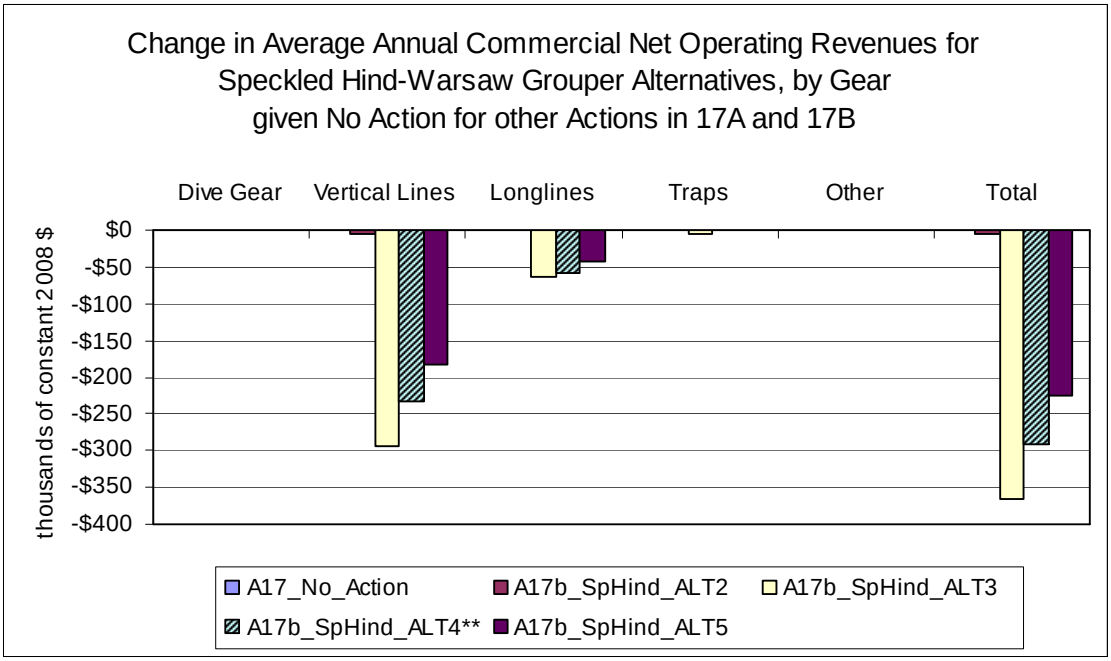


*Figure 3b. Predicted percentage change in commercial net operating revenues by gear type for speckled hind-warsaw grouper alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*

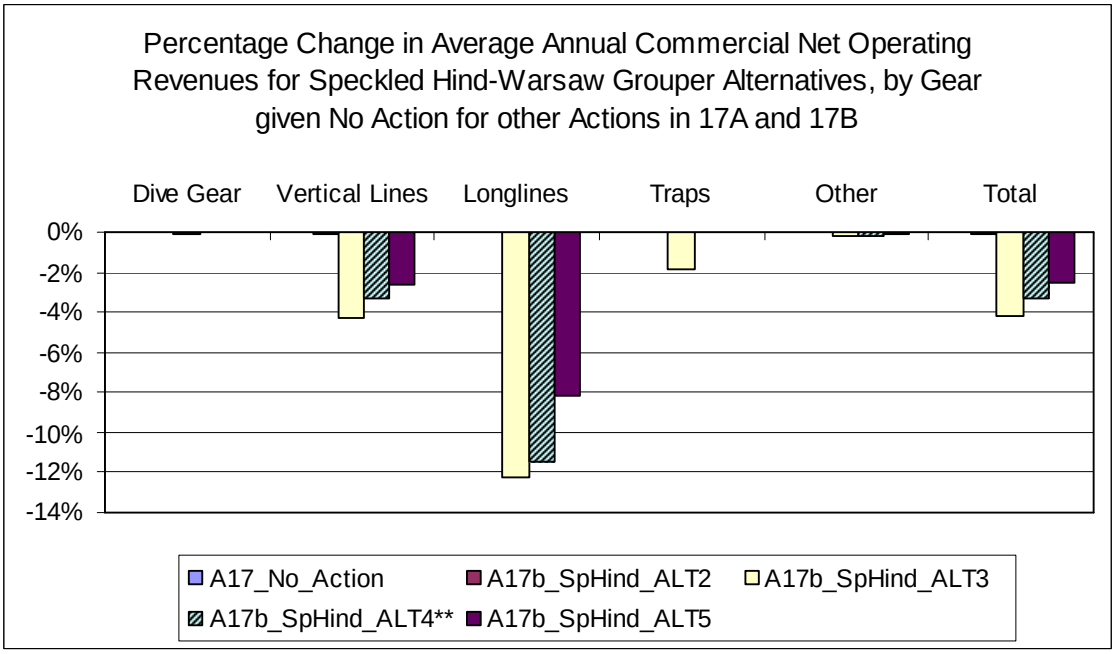


*Figure 4a. Predicted change in commercial net operating revenues by state of landing for speckled hind-warsaw grouper alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*

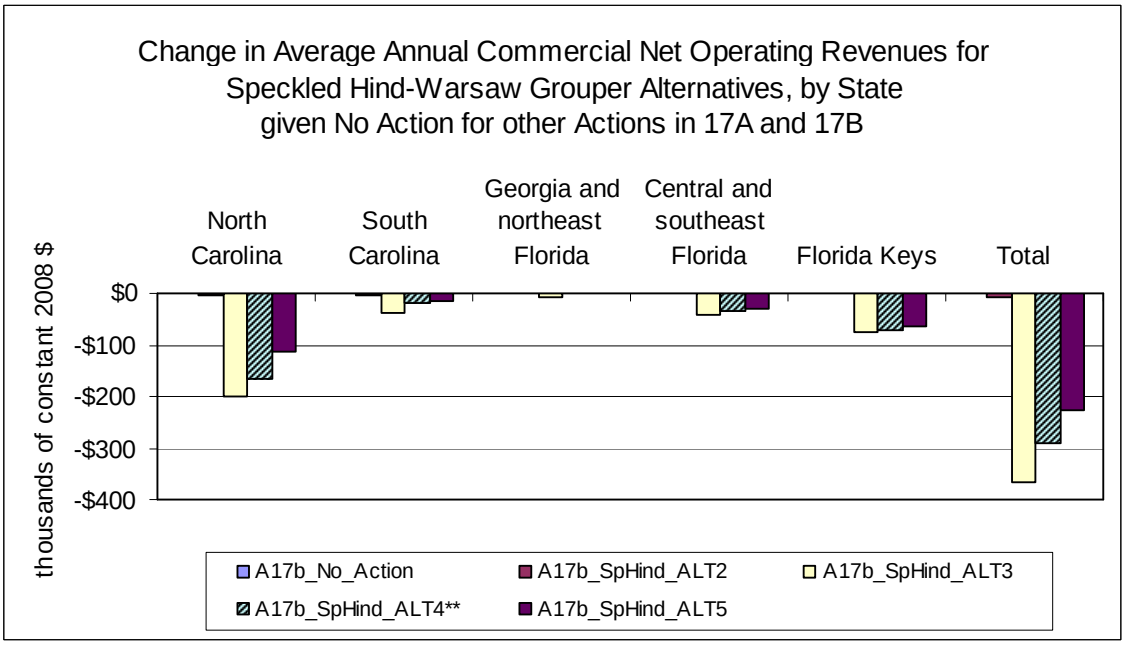
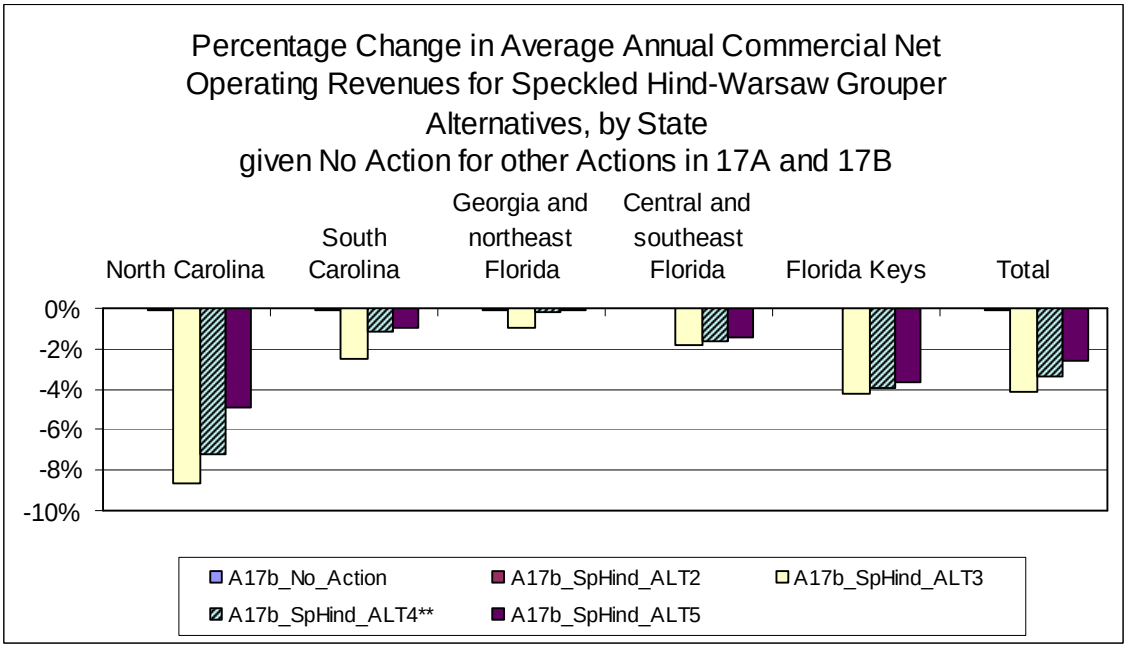


*Figure 4b. Predicted percentage change in commercial net operating revenues by state of landing for speckled hind-warsaw grouper alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*



Management Alternatives for Golden Tilefish

Amendment 17B proposes two management actions for tilefish, including an action to specify the total allowable catch and an action to specify the allocation of that catch between the commercial and recreational sectors. Both actions affect the annual catch limit available to the commercial sector. Hence, they are evaluated jointly.

While the allowable catch action has five management alternatives and the allocation action has four alternatives, they reflect two management choices for total allowable catch and four management choices for allocation. The no-action alternative for total allowable catch for the commercial and recreational sectors combined is 300,380 pounds gutted weight, and all other alternatives are based on an allowable catch of 291,566 pounds gutted weight. Allocation Alternative 2 specifies a commercial share of 96 percent of total allowable catch, while allocation Alternative 3 specifies a commercial share of 97 percent of total allowable catch and Alternative 4 specifies a commercial share of 50 percent of total allowable catch. The implied commercial share for the no-action allocation alternative was calculated as 98.2 percent of total allowable catch based on the ratio of the existing commercial quota (295,000 pounds gutted weight) to the existing total allowable catch (300,380 pounds gutted weight). The management scenario with a commercial allocation of 97 percent (allocation alternative 3) and the lower total allowable catch (ACL alternative 2) reflects the Council's preferred alternatives for tilefish.

From a modeling perspective, eight management scenarios were evaluated for golden tilefish, with each scenario representing a different combination of total allowable catch and commercial share of the allowable catch. See Table 2.[3] All scenarios retain the existing commercial trip limits of 4,000 pounds gutted weight until 75% of the commercial ACL is taken. The trip limit is reduced to 300 pounds after 75% of the quota is taken, but only if this occurs on or before September 1.

Table 2. Scenarios that were evaluated for management of golden tilefish. (Table 2 paraphrases rather than includes a verbatim statement of management scenarios from Amendment 17B.)

Model Name	*Description*
A17b_NO_ACTION	*Allocation Alternative 1 and ACL Alternative 1*: No Action. Retain existing regulations for golden tilefish based on a total allowable catch of 300,380 lbs gw and an implied commercial allocation of 98.2 percent. The commercial ACL equals the existing quota of 295,000 lbs gw. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. The trip limit is 4,000 lbs (gw) until 75% of the quota is taken. The trip limit is reduced to 300 pounds after 75% of the quota is taken, but only if this occurs on or before September 1.
A17b_Tilefish_alloc2_ACL1	*Allocation Alternative 2 and ACL Alternative 1*: The total allowable catch would remain at 300,380 lbs gw. The commercial ACL would be

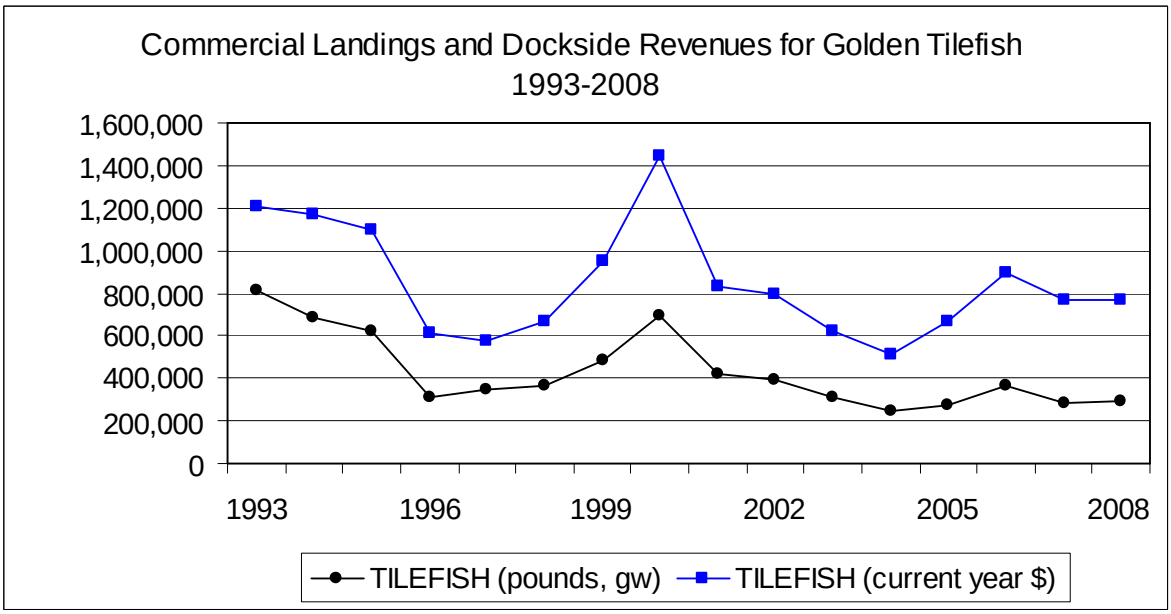
[3] Table 2 reflects new numbering for the management scenarios based on recent decisions at the Council's September meeting.

Model Name	*Description*
	288,365 lbs gw based on a commercial allocation of 96 percent. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. Retain existing trip limits.
A17b_Tilefish_alloc3_ACL1	*Allocation Alternative 3 and ACL Alternative 1*: The total allowable catch would remain at 300,380 lbs gw. The commercial ACL would be 291,369 lbs gw based on a commercial allocation of 97 percent. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. Retain existing trip limits.
A17b_Tilefish_alloc4_ACL1	*Allocation Alternative 4 and ACL Alternative 1*: The total allowable catch would remain at 300,380 lbs gw. The commercial ACL would be 150,190 lbs gw based on a commercial allocation of 50 percent. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. Retain existing trip limits.
A17b_Tilefish_alloc1_ACL2	*Allocation Alternative 1 and ACL Alternative 2*: The total allowable catch would be determined at the Foy level of 291,566 lbs gw. The commercial ACL would be 286,344 lbs gw based on the implied existing commercial allocation of 98.2 percent. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. Retain existing trip limits.
A17b_Tilefish_alloc2_ACL2	*Allocation Alternative 2 and ACL Alternative 2*: The total allowable catch would be determined at the Foy level of 291,566 lbs gw. The commercial ACL would be 279,903 lbs gw based on a commercial allocation of 96 percent. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. Retain existing trip limits.
A17b_Tilefish_alloc3_ACL2**	*Allocation Alternative 3 and ACL Alternative 2 (Preferred)*: The total allowable catch would be determined at the Foy level of 291,566 lbs gw. The commercial ACL would be 282,819 lbs gw based on a commercial allocation of 97 percent. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. Retain existing trip limits.
A17b_Tilefish_alloc4_ACL2	*Allocation Alternative 4 and ACL Alternative 2*: The total allowable catch would be determined at the Foy level of 291,566 lbs gw. The commercial ACL would be 145,783 lbs gw based on a commercial allocation of 50 percent. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. Retain existing trip limits.

** denotes the Council's preferred alternatives.

Commercial landings of tilefish have fluctuated widely, with an historical peak of nearly 3.4 million pounds (gutted weight) in 1983. More recently, the commercial fishery landed 815,100 pounds (gutted weight) worth $1.2 million in 1993 and 692,700 pounds worth $1.4 million in 2000 (Figure 5).[4] The fishery also landed only 314,300 pounds worth $574,100 in 1996 and 243,200 pounds worth $510,200 in 2004. Landings averaged 305,300 pounds worth $772,700 from 2005-2008. Dockside revenues and pounds landed fluctuate in the same direction (Figure 5), which suggests that ex-vessel demand is price elastic. The policy implication is that regulations that reduce industry landings in the short-term are expected to reduce dockside revenues in the short-term. Conversely, dockside revenues are expected to increase over time if regulation successfully increases biomass and landings.

Figure 5. Commercial landings in federal waters: golden tilefish, 1993-2008.



Source: SEFSC logbook database as of June 29, 2009.

A commercial quota and trip limit were first implemented in 1994 by Amendment 6.[5] More restrictive management was implemented in October 2006 by Amendment 13C, including a commercial quota of 295,000 pounds gutted weight and the present tiered system of trip limits.

The allocation and allowable catch alternatives in Amendment 17B are modeled as additional reductions in the commercial quota. The reductions are approximately 5 percent or less for most management scenarios not involving allocation Alternative 4, and range from 3,600 pounds (1.2 percent) for the scenario with allocation Alternative 3 and the no-action ACL alternative to a 15,100 pound reduction (5.1 percent) for allocation Alternative 2 and ACL Alternative 2. The

[4] Revenues are presented as current year dollars and have not been adjusted for inflation over time. Trip revenues were approximated as reported landings from the logbook database multiplied by average prices from the NMFS Accumulated Landings System.

[5] Amendment 6 specified a commercial quota in 1994 of more than 1.4 million lbs (gutted weight), and a trip limit of 5,000 lbs until the quota was filled and 300 lbs after the quota was filled. The quota declined to 1.2 million lbs in 1995 and 1.0 million lbs in 1996. The quotas were not filled (Figure 5).

simulation model predicts that these reductions in commercial catch limits would generate an overall reduction in net operating revenues that ranges from approximately $3,500 to $12,500 or less than 0.15 percent to the entire snapper-grouper fishery (Figures 6a and 6b).

Larger reductions in the commercial catch limit are associated with allocation Alternative 4, which specifies a 50 percent commercial share of the total allowable catch. The commercial catch limit would decline by 144,800 pounds (49 percent) with ACL Alternative 1 and by 149,200 pounds (50.6 percent) with ACL Alternative 2. Net operating revenues for the entire commercial snapper-grouper fishery are predicted to decline by approximately $200,000 or 2.3 percent and $207,000 or 2.4 percent for these scenarios (Figures 6a and 6b). Boats that use bottom longlines are predicted to lose 35 percent and 36 percent of baseline net operating revenues, respectively. Although commercial landings of tilefish would decline by approximately 50 percent, the expected reductions in dockside revenues would be partially offset by lower operating costs as fewer trips would be taken. Losses would be incurred primarily by longline boats in central Florida and South Carolina (Figures 7a and 7b).

The economic effects of the tilefish alternatives differ due to differences in the magnitude of the commercial catch limit and the timing of the adjustment in the trip limit from 4000 pounds to 300 pounds. Not surprisingly, the smaller the commercial catch limit, the greater the expected reductions in net operating revenues for commercial fishermen. In addition, the simulation model predicts that lower commercial catch limits would trigger the smaller trip limit at an earlier date each year.

Interestingly, the simulation model predicts that the system of trip limits will prevent the quota from being filled and the fishery from being closed, except for the scenarios with allocation alternative 4. This contrasts with actual experience because the tilefish fishery was closed on October 23, 2006, October 3, 2007 and August 17, 2008. The fishery did not close in 2005 because Amendment 13C was not implemented until 2006. Although the simulation analysis did not use data for 2009, we note that the commercial fishery for tilefish was closed on July 15, 2009. The reason for this discrepancy between the observed closures and the simulation model's predictions is that landings as reported to the logbook database sum approximately to the commercial quota for 2006, 2007 and 2008, and that landings in 2005 were below average and below the quota specified by Amendment 13C. Therefore, the 4-year average for landings of tilefish falls short of the existing commercial quota. When combined with the effects of the trip limits, simulated landings fall short of the proposed quotas, except for the management scenarios with a 50% commercial allocation.

A weakness of the simulation model is its reliance on historical fishery data to predict future fishing patterns when fishermen adjust to regulation over time. The failure of the model to predict closures for the tilefish fishery reflects the willingness and ability of fishermen to change their fishing patterns and strategies in response to regulation. In this case, fishermen are harvesting tilefish earlier in the fishing year. As a result, the model may underpredict actual losses to the snapper-grouper fishery due to a smaller commercial quota for tilefish, but probably by only a small amount because the landings of tilefish are underpredicted in the simulation of the no-action alternative as well as in the simulation of the proposed management scenarios.

Changes in the fishery due to the proposed alternatives in Amendment 17B are calculated as the difference between the outcomes of the proposed alternative and the no-action alternative.

*Figure 6a. Predicted change in commercial net operating revenues by gear type for golden tilefish alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*

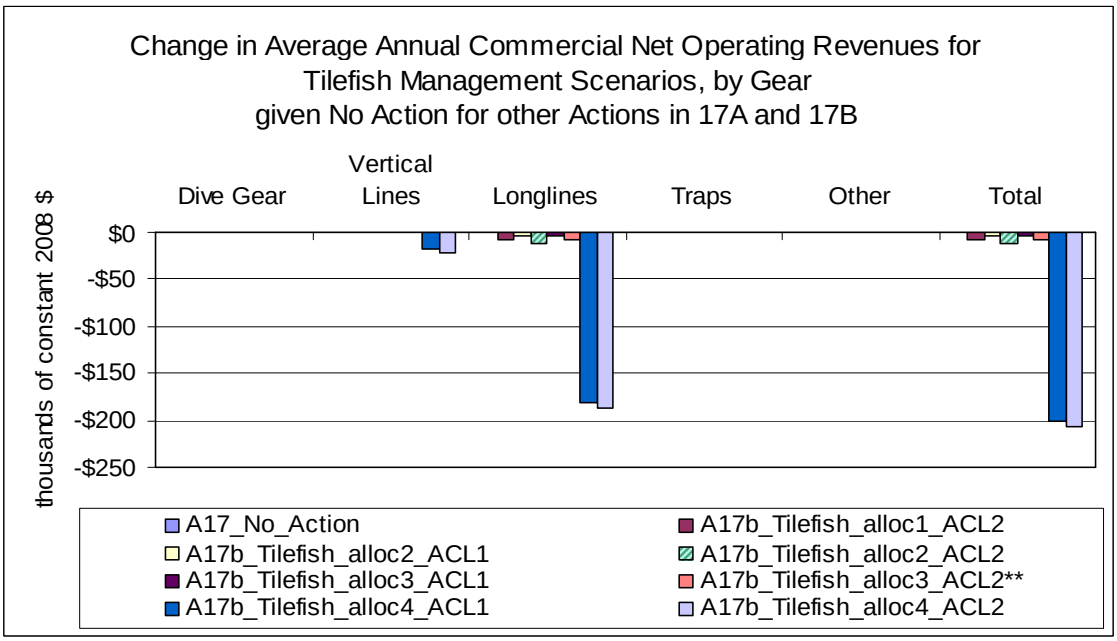


*Figure 6b. Predicted percentage change in commercial net operating revenues by gear type for golden tilefish alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*

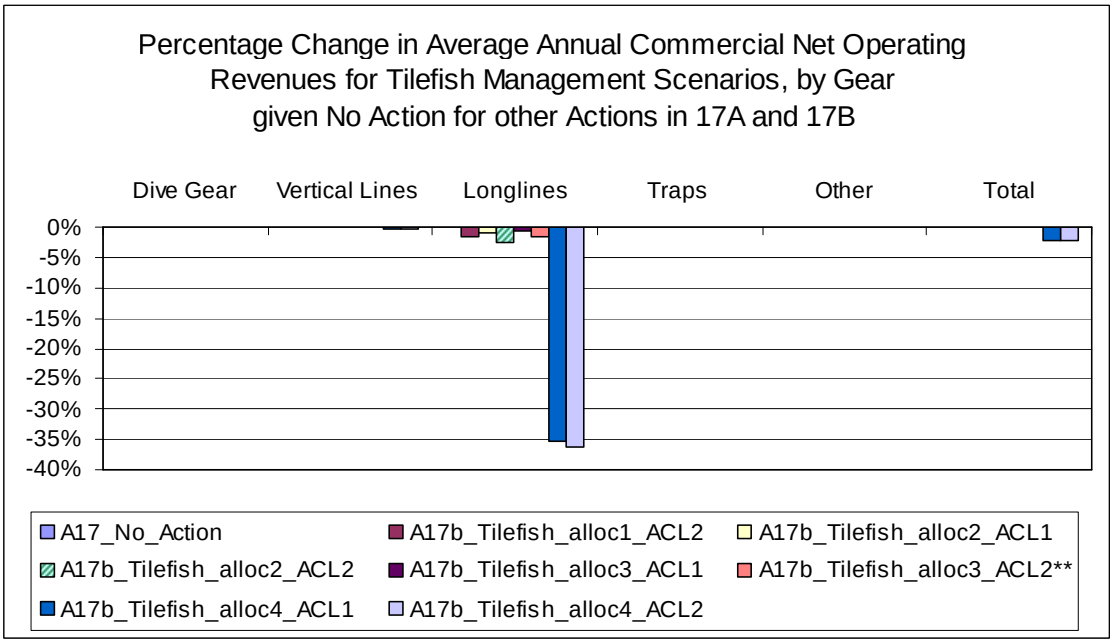


*Figure 7a. Predicted change in commercial net operating revenues by state of landing for golden tilefish alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*

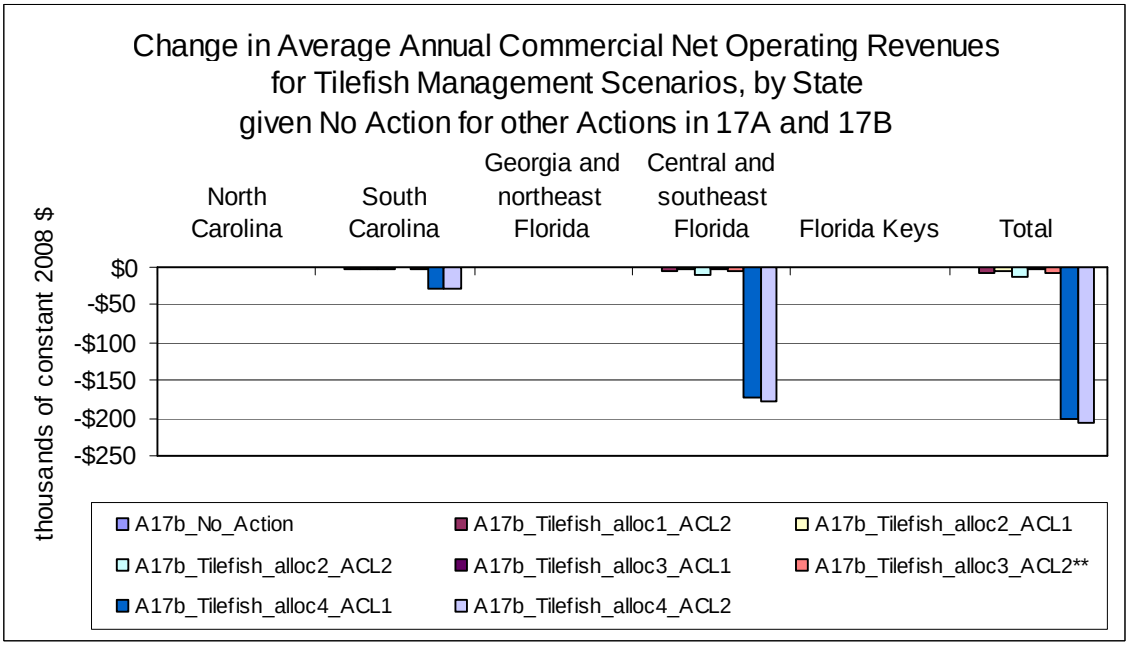
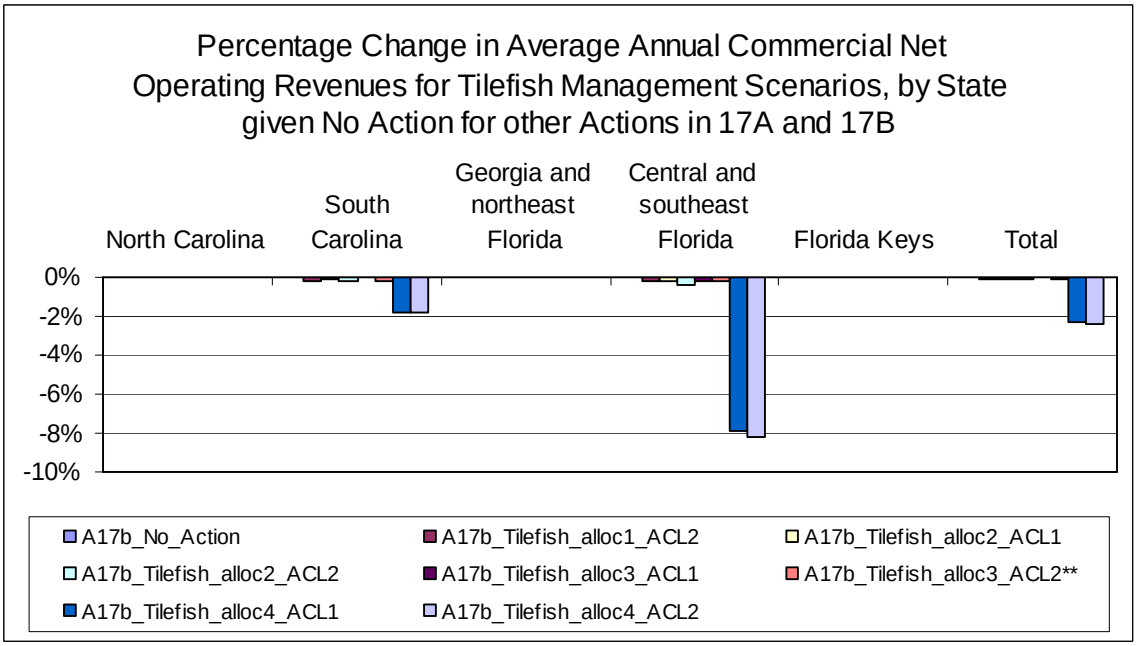


*Figure 7b. Predicted percentage change in commercial net operating revenues by state of landing for golden tilefish alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*



Management Alternatives for Red Grouper and Black Grouper

Amendment 17B considers three methods of establishing commercial catch limits for red grouper and black grouper. Alternative 1 is the no-action alternative in which no catch limits are specified. However beginning in mid-2009, Amendment 16 indirectly limits the commercial catch of red grouper and black grouper. The commercial fishery for shallow water groupers, including red grouper and black grouper, is closed from January through April and when the commercial ACL for gag of 353,940 lbs (gutted weight) is filled. Alternative 2a in Amendment 17B would specify individual catch limits for each species: 221,577 pounds (gutted weight) for red grouper and 86,886 pounds (gutted weight) for black grouper. Alternative 2b would specify an aggregate commercial catch limit of 662,403 pounds (gutted weight) for gag, red grouper and black grouper. Alternative 2b is the Council's preferred alternative. See Table 3.

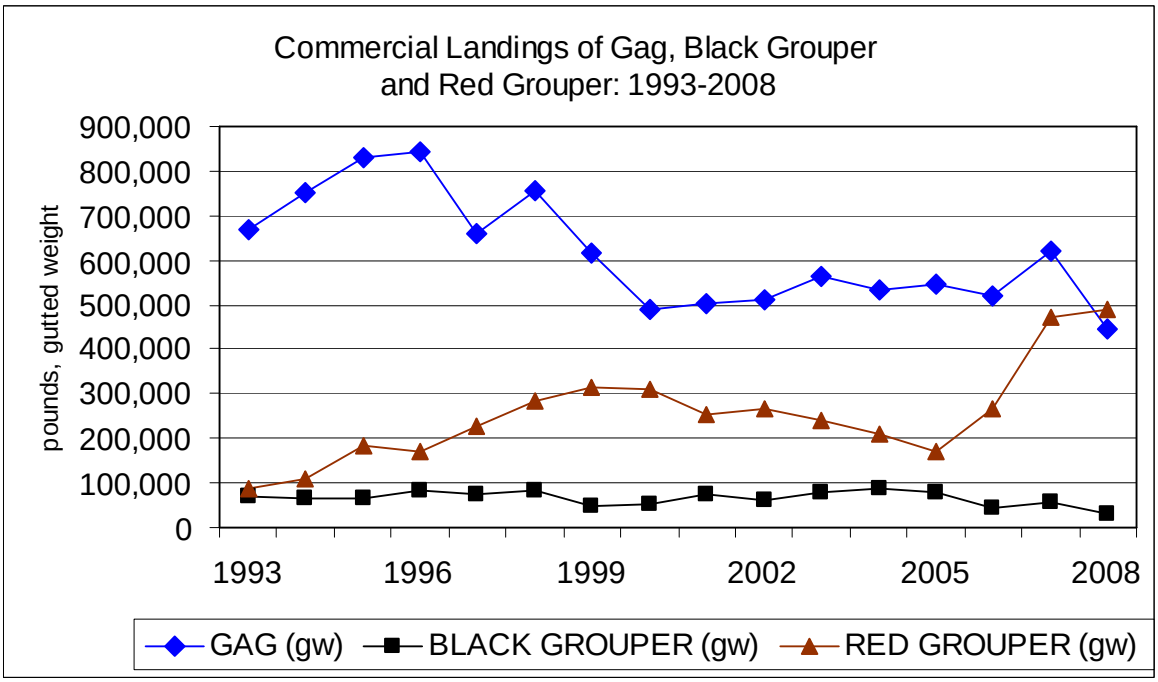
Table 3. Proposed alternatives in Amendment 17B for the management of red grouper and black grouper. (Table 3 paraphrases rather than includes a verbatim statement of alternatives from Amendment 17B.)

Model Name	*Description*
A17b_NO_ACTION	*Alternative 1*: No Action. Retain existing regulations for red grouper and black grouper. The commercial fishery for shallow water groupers, including red grouper and black grouper, is closed from January through April and when the commercial ACL for gag of 353,940 lbs gw is filled. Retain the existing 12 inch minimum size limit for red grouper and 24 inch minimum size limit for black grouper.
A17b_RedGrouperACL_Alt2a	*Alternative 2a*: The commercial ACL for red grouper is 221,577 lbs gw. Close the commercial fishery for red grouper when its ACL is filled. The commercial ACL for black grouper is 86,886 lbs gw. Close the commercial fishery for black grouper when its ACL is filled. The commercial fishery for shallow water groupers, including red grouper and black grouper, is closed from January through April and when the commercial ACL for gag of 353,940 lbs gw is filled, even if the individual ACLs for red grouper and/or black grouper have not been filled. Retain the existing 12 inch minimum size limit for red grouper and 24 inch minimum size limit for black grouper.
A17b_RedGrouperACL_Alt2b**	*Alternative 2b (Preferred)*: Retain the current commercial ACL for gag of 353,940 lbs gw and establish an aggregate commercial ACL for gag, red grouper and black grouper of 662,403 lbs gw. The commercial fishery for shallow water groupers, including red grouper and black grouper, is closed from January through April and when the commercial ACL for gag is filled or when the aggregate ACL for gag, red grouper and black grouper is filled. Retain the existing 12 inch minimum size limit for red grouper and 24 inch minimum size limit for black grouper.

** denotes the Council's preferred alternative.

Commercial landings of red grouper in federal waters increased from approximately 87,700 pounds (gutted weight) worth $171,500 in 1993 to 316,000 pounds worth $742,200 in 1999 and then declined through 2005 (Figure 8).[6] The sharp increase in landings from 171,200 pounds worth $471,200 in 2005 to 491,300 pounds worth more than $1.61 million in 2008 could reflect an adjustment by fishermen to regulations on other species that were imposed in 2006 by Amendment 13C and/or a larger biomass of red grouper available for capture. Commercial landings of black grouper in federal waters averaged 52,400 pounds (gutted weight) worth $183,700 from 2005-2008. Commercial landings of gag in federal waters averaged 533,100 pounds (gutted weight) worth more than $2.1 million from 2005-2008, but, as already noted, Amendment 16 implemented a commercial quota of 353,940 pounds in 2009.

Figure 8. Commercial landings in federal waters: gag, red grouper, and black grouper, 1993-2008.



Source: SEFSC logbook database as of June 29, 2009.

Alternative 2a proposes a commercial catch limit that is less than one-half of the quantities of red grouper that were landed from federal waters in 2007 and 2008, as reported in the logbook database. Nevertheless, the simulation model predicts that commercial net operating revenues would decline by an average of approximately $162,000 per year, or only 1.8 percent of the predicted base net operating revenues for Amendment 17B (Figures 9a and 9b). This seemingly unexpected result occurs because the simulation model calculates expected economic outcomes based on average results when proposed regulations are imposed on logbook data for 2005-2008.

[6] Revenues are presented as current year dollars and have not been adjusted for inflation over time. Trip revenues were approximated as reported landings multiplied by average prices from the NMFS Accumulated Landings System.

The problem is that regulatory conditions during 2005 and 2006, before Amendment 13C was implemented, are not as relevant for the red grouper fishery as are conditions during 2007 and 2008, and larger losses would have been predicted if the analysis had been based on data for 2007 and 2008 only. If fishing and regulatory conditions in the near future closely resemble conditions in 2007, then the simulation model predicts that net operating revenues would decline by about $244,000 or 2.7 percent compared to baseline conditions. If conditions in the near future were similar to conditions in 2008, then the model predicts that net operating revenues would decline by $404,000 or 4.1 percent. These effects would primarily affect fishermen in North Carolina and South Carolina (Figures 10a and 10b).[7] The commercial catch limit proposed for black grouper in Alternative 2a is expected to have no effect on net operating revenues of commercial fishermen because average landings of black grouper in federal waters were less than the proposed catch limit.

The aggregate catch limit for gag, red grouper and black grouper in Alternative 2b is expected to reduce commercial net operating revenues by slightly more than $100,000 per year, or only 1.2 percent of the predicted base net operating revenues for Amendment 17B (Figures 9a, 9b). These results are expectations based on the four-year average with data from 2005-2008. If fishing and regulatory conditions in the near future closely resemble conditions in 2007, then the simulation model predicts that net operating revenues would decline by about $177,000 or 2.0 percent compared to baseline conditions. If conditions in the near future were similar to conditions in 2008, then the model predicts that net operating revenues would decline by $236,000 or 2.4 percent.

While the aggregate catch limit of Alternative 2b equals the sum of the individual catch limits in Alternative 2a for gag, red grouper and black grouper, it would function differently in terms of closing the commercial fisheries. With Alternative 2b and given fishing conditions similar to 2007 and 2008, landings of red grouper could exceed the individual catch limit specified in Alternative 2a, yet in this case the fishery would not close because the aggregate quota was not filled until a later date. The simulation model would have closed the red grouper fishery with Alternative 2a in these instances.

[7] Figures 10a and 10b display the four-year averages of simulated results.

*Figure 9a. Predicted change in commercial net operating revenues by year for red grouper and black grouper alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*

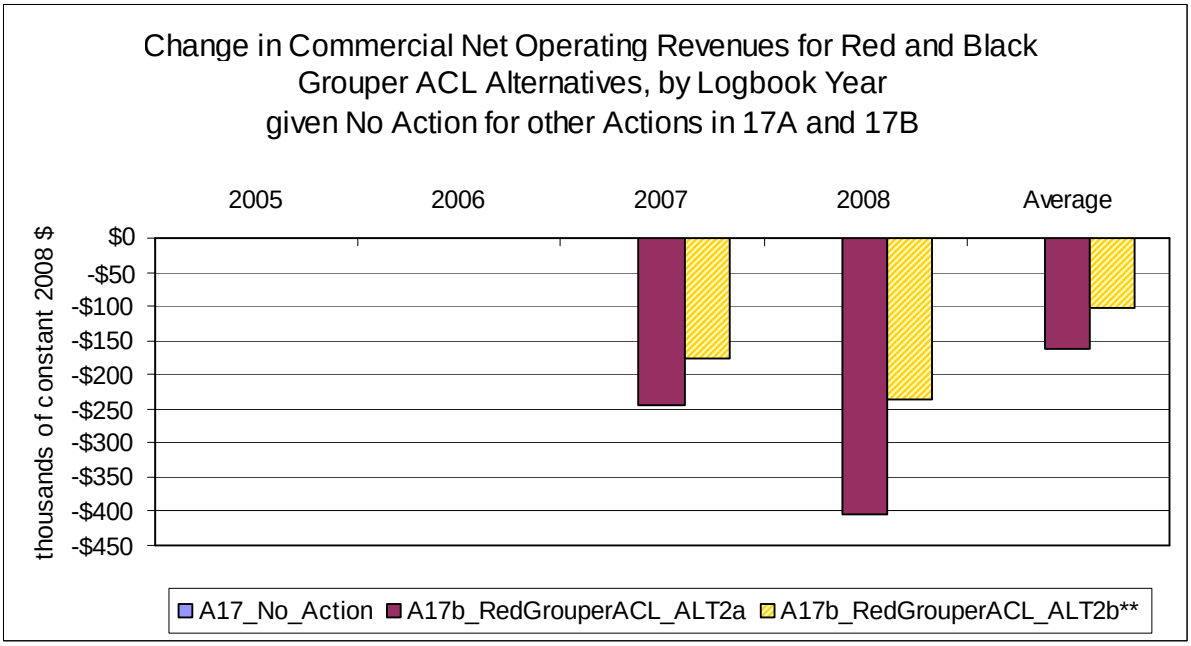


*Figure 9b. Predicted percentage change in commercial net operating revenues by year for red grouper and black grouper alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*

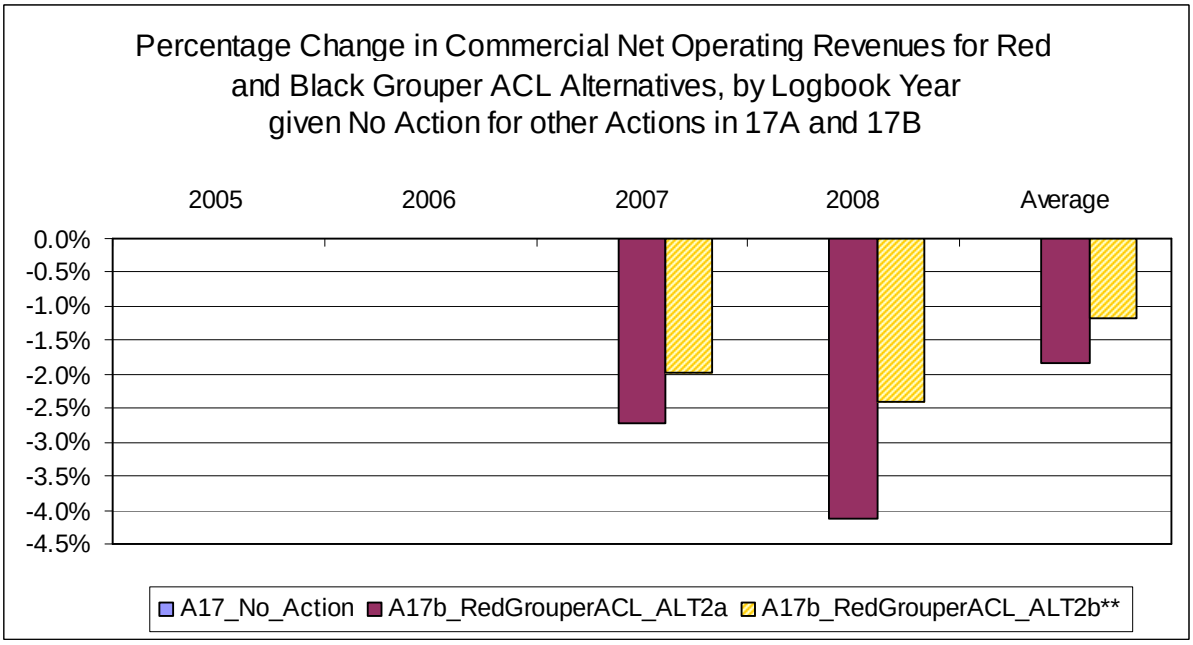


*Figure 10a. Predicted change in commercial net operating revenues by state of landing for red grouper and black grouper alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*

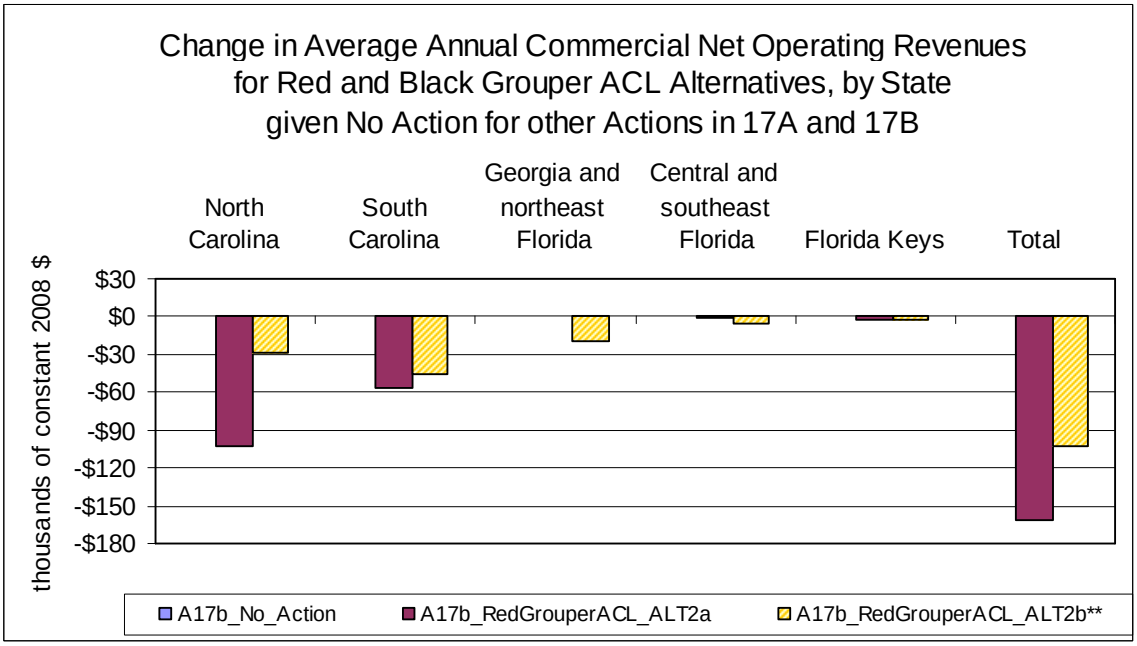
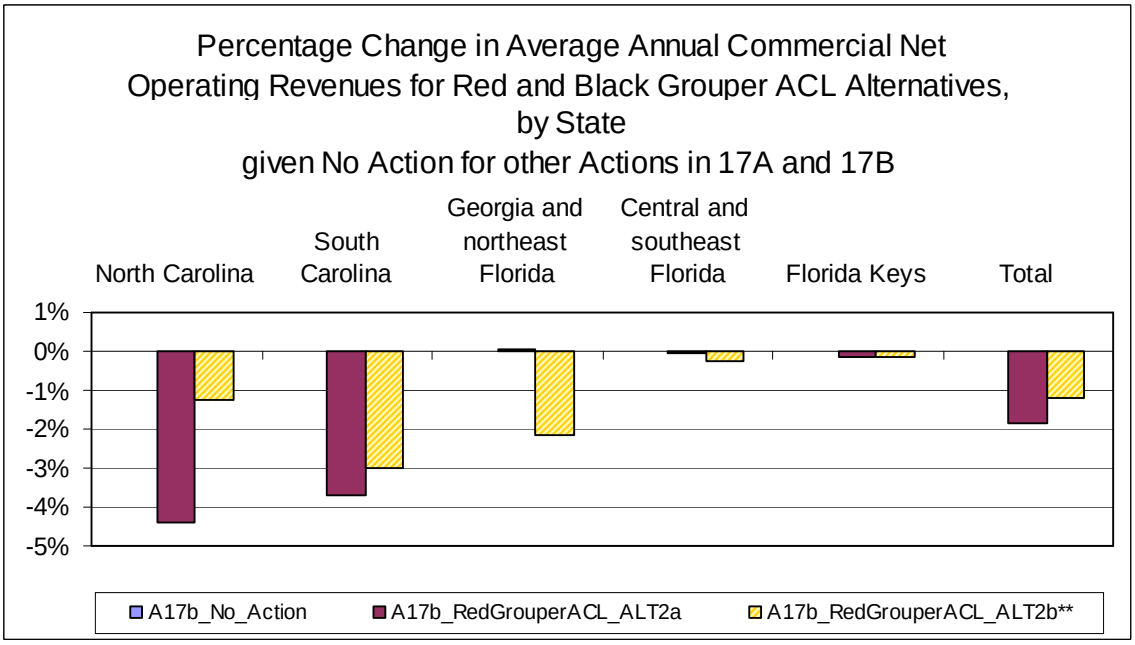


*Figure 10b. Predicted percentage change in commercial net operating revenues by state of landing for red grouper and black grouper alternatives compared to the No-Action alternative for Amendment 17B. (** denotes the Council's preferred alternative.)*



Simultaneous Evaluation of Preferred Alternatives

Previous sections compared the effects of proposed alternatives within each Action by assuming the No-Action alternative for other Actions. This section compares the joint effects of the Council's preferred alternatives for all Actions with the No-Action alternative for Amendment 17B. At the conclusion of the Council's meeting in September 2009, the preferred alternatives included Alternative 4 for speckled hind and warsaw grouper, Alternative 3 for tilefish allocation, Alternative 2 for tilefish total allowable catch, and Alternative 2b for the red grouper and black grouper ACL. The No-Action alternative includes the simulated effects on the commercial fishery of Amendments 13C and 16. See Table 4.

Table 4. Preferred alternatives in Amendment 17B after the Council's meeting in September 2009. (Table 4 paraphrases rather than includes a verbatim statement of alternatives from Amendment 17B.)

Model Name	*Description*
A17b_NO_ACTION	*No Action.* Retain existing regulations for speckled hind and warsaw grouper. Prohibit purchase and sale of speckled hind and warsaw grouper. Allow one speckled hind and one warsaw grouper per vessel per trip as part of the 3-fish recreational bag limit for groupers. Retain existing regulations for golden tilefish based on a total allowable catch of 300,380 lbs gw and an implied commercial allocation of 98.2 percent. The commercial ACL equals the existing quota of 295,000 lbs gw. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. The trip limit is 4,000 lbs (gw) until 75% of the quota is taken. The trip limit is reduced to 300 pounds after 75% of the quota is taken, but only if this occurs on or before September 1. Retain existing regulations for red grouper and black grouper. The commercial fishery for shallow water groupers, including red grouper and black grouper, is closed from January through April and when the commercial ACL for gag of 353,940 lbs gw is filled. Retain the existing 12 inch minimum size limit for red grouper and 24 inch minimum size limit for black grouper.
A17b_Preferred_ALTS	*Speckled Hind and Warsaw Grouper Alternative 4*: Establish an ACL=0 for speckled hind and warsaw grouper. Prohibit all commercial and recreational fishing for, possession, and retention of speckled hind and warsaw grouper. Prohibit all fishing for, possession, and retention of snowy grouper, yellowedge grouper, misty grouper, blueline tilefish, queen snapper, and silk snapper beyond a depth of 240 feet (40 fathoms; 73 m). *Tilefish Allocation Alternative 3 and ACL Alternative 2*: The total allowable catch would be determined at the Foy level of 291,566 lbs

	gw. The commercial ACL would be 282,819 lbs gw based on a commercial allocation of 97 percent. Prohibit harvest, possession, retention and sale of golden tilefish when the quota is met. Retain existing trip limits. *Red Grouper-Black Grouper ACL Alternative 2b*: Retain the current commercial ACL for gag of 353,940 lbs gw and establish an aggregate commercial ACL for gag, red grouper and black grouper of 662,403 lbs gw. The commercial fishery for shallow water groupers, including red grouper and black grouper, is closed from January through April and when the commercial ACL for gag is filled or when the aggregate ACL for gag, red grouper and black grouper is filled. Retain the existing 12 inch minimum size limit for red grouper and 24 inch minimum size limit for black grouper.

An important characteristic of the commercial snapper-grouper fishery is that fishermen usually catch more than one species on the same trip. If two or more proposed regulations affect different species that generally are landed on the same trips, then it is possible that their joint effects could differ from the sum of the effects for each regulation considered separately.

This is not the case for Amendment 17B, which considers additional management for three relatively distinct portions of the snapper-grouper fishery. The proposed management alternatives for speckled hind and warsaw grouper primarily would affect deepwater species and have little effect on trips that land shallow water groupers or tilefish. The proposed alternatives for red grouper and black grouper primarily would affect trips with shallow water groupers and have little effect on trips that land deep water species or tilefish. Similarly, the proposed alternatives for tilefish primarily would affect trips for tilefish and have little effect on trips that land shallow water groupers or the deep water species. As a result, the effect of the preferred alternatives when evaluated simultaneously is approximately equal to the sum of the effects of each preferred alternative when evaluated separately.

Average annual net operating revenues to boat owners and crew after deducting trip costs would decline from $8.78 million in constant 2008 dollars to approximately $8.38 million with the preferred management alternatives for speckled hind, warsaw grouper, tilefish, red grouper and black grouper. The average annual difference of -$0.40 million between the No Action and Preferred management scenarios represents a 4.6% average annual short-term economic loss that would be incurred by the commercial snapper-grouper fishery. Actual losses would vary annually depending on economic, biological and environmental conditions. For example, the expected losses of $0.80 million (an 8.2% loss compared to No Action) with fishing conditions as characterized in 2008 would be approximately twice the average annual loss of $0.40 million, whereas the predicted losses of approximately $0.15 million (a 1.9% loss compared to No Action) with fishing conditions as characterized in 2005 would be approximately half the average (Figures 11a and 11b).

Figure 11a. Predicted change in commercial net operating revenues by year for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

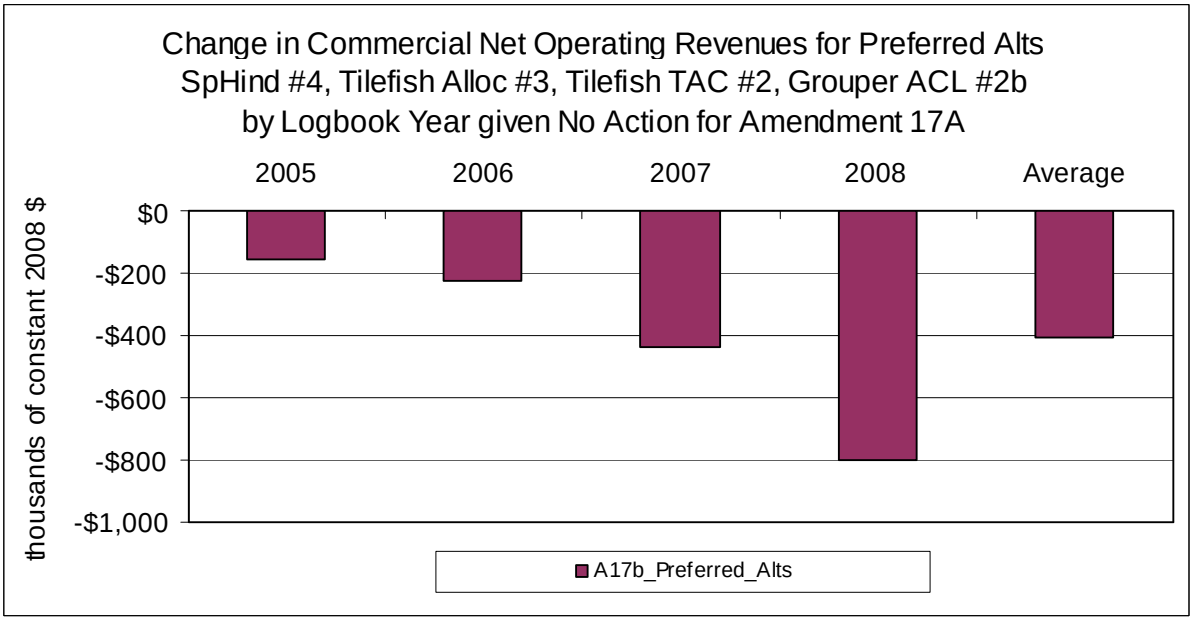


Figure 11b. Predicted percentage change in commercial net operating revenues by year for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

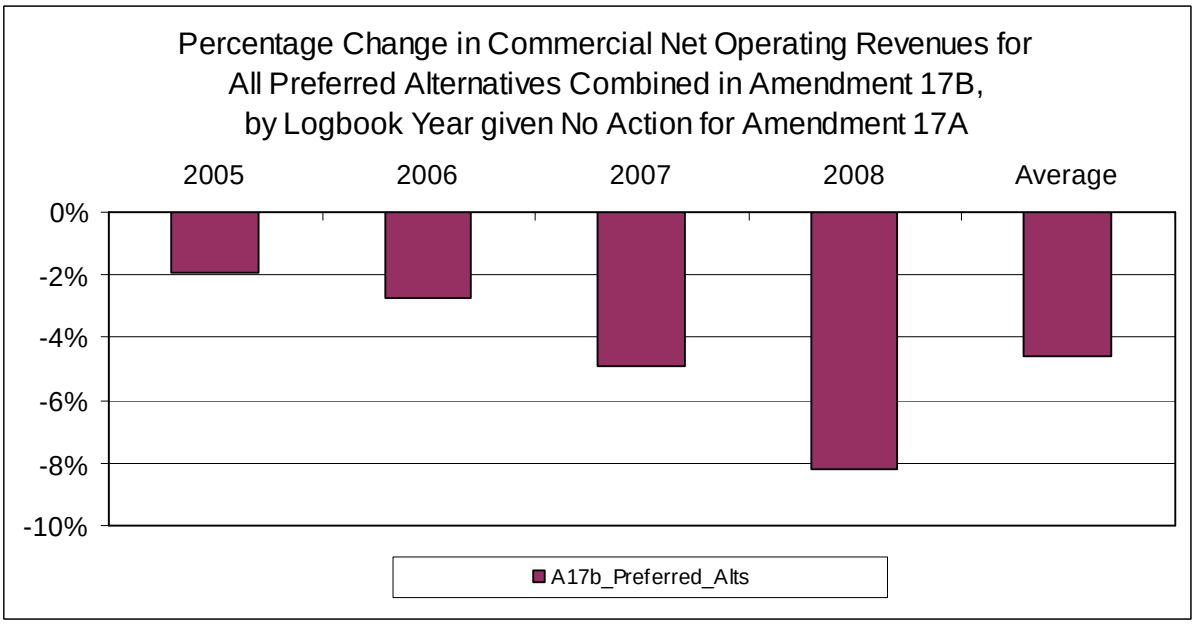


Figure 12a. Predicted change in commercial net operating revenues by gear for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

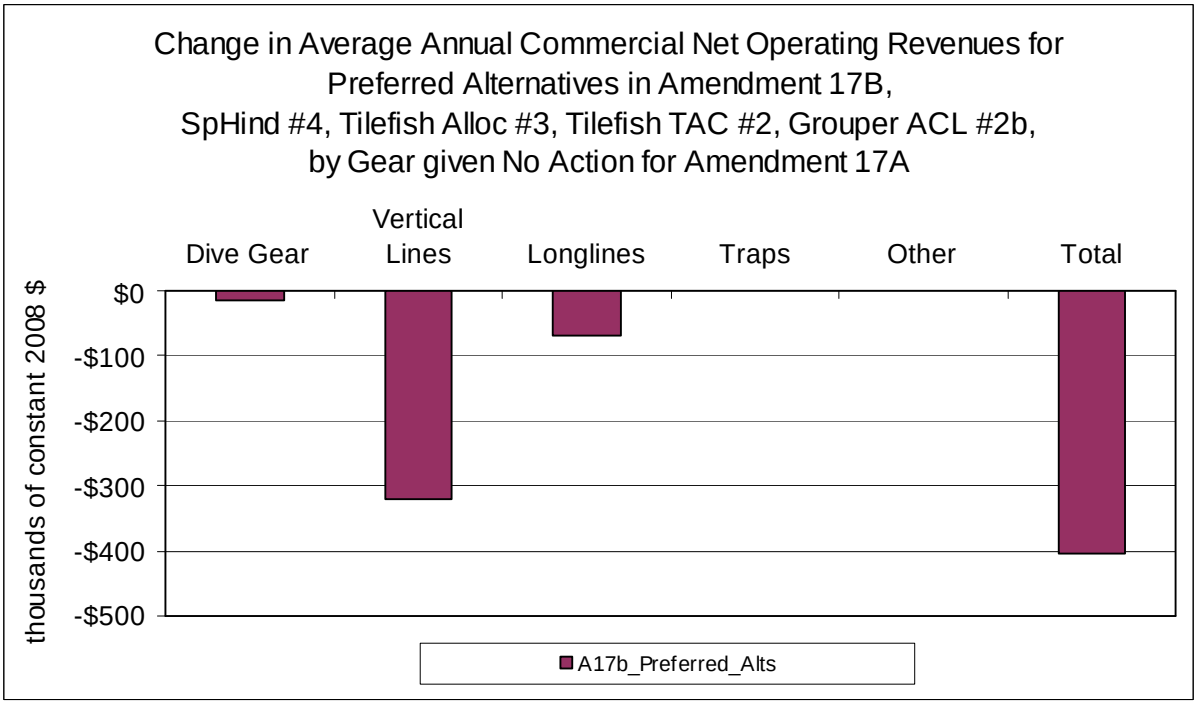
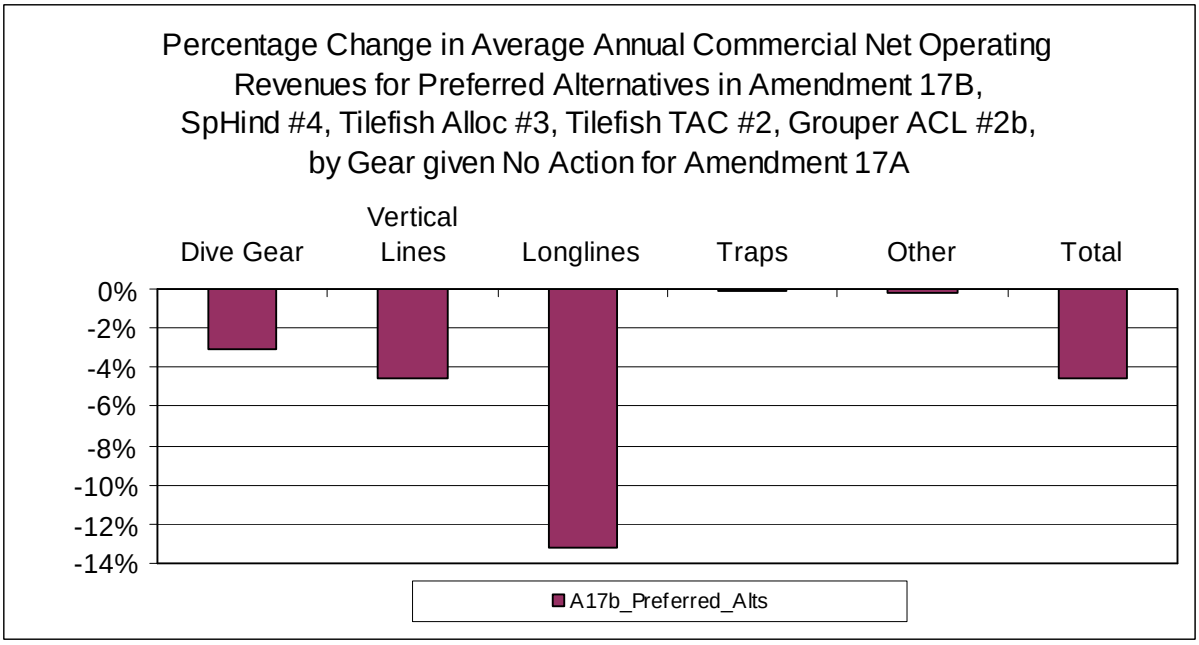


Figure 12b. Predicted percentage change in commercial net operating revenues by gear for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.



The expected economic losses differ by gear. Most of the losses in dollars would be incurred by boats on trips with vertical line gear because that is the predominant gear in the fishery. Fishermen on trips with longlines represent a smaller component of the snapper-grouper fishery, but would incur greater percentage losses because the prohibition on the harvest of deep water species in waters deeper than 240 feet would eliminate most of the longline fishery for snowy grouper and yellowedge grouper. Fishermen on trips with vertical line gear are expected to lose an annual average of slightly more than $320,000 per year in constant 2008 dollars, or about 4.6% compared to No Action, while fishermen on trips with bottom longlines are expected to lose an average of $68,000 per year, or about 13.2% compared to their earnings with No Action (Figures 12a and 12b).

The economic effects of Amendment 17B also are expected to differ by state of landing. Fishermen from North Carolina, South Carolina, and the Florida Keys would incur the greatest losses in terms of both dollars and percentages, whereas fishermen from Georgia through southeast Florida would be affected to a lesser extent (Figures 13a and 13b). The geographic distribution of expected reductions in net operating revenues primarily reflects the location of fishing activities for the species whose harvest would be prohibited in waters deeper than 240 feet.

Most vessels would not be affected by the preferred alternatives. The logbook database includes trip reports for 776 vessels in 2005, 765 vessels in 2006, 760 vessels in 2007 and 791 vessels in 2008. Over the 4-year period, approximately 77.3 percent of vessels would not be affected by the preferred alternatives in Amendment 17B. Approximately 13.5 percent would be expected to incur losses of less than $1,000 per vessel. Another 6.3 percent would be expected to incur losses between $1,000 and $5,000 per vessel, and 2.2 percent would be expected to incur losses of more than $5,000. Approximately 0.7 percent would be expected to realize a gain in net operating revenues. Based on logbook data for 2005-2008, the maximum loss per vessel would be approximately $131,000 given conditions in 2008, and the maximum gain per vessel would be approximately $3,000 given conditions in 2006.

Figure 13a. Predicted change in commercial net operating revenues by state of landing for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.

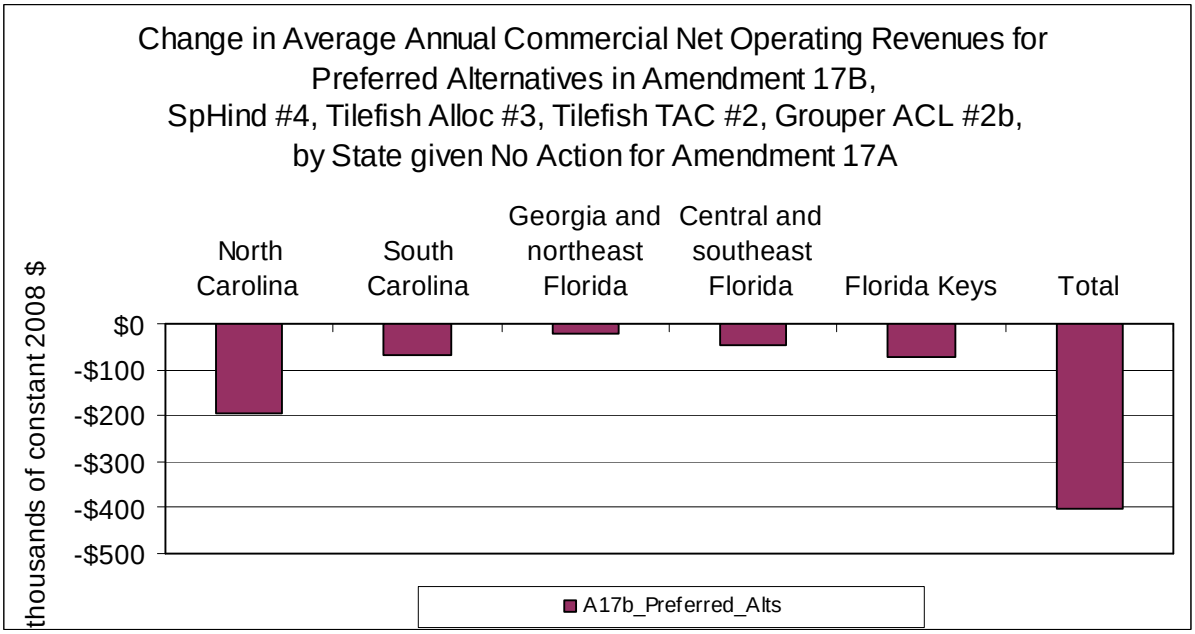
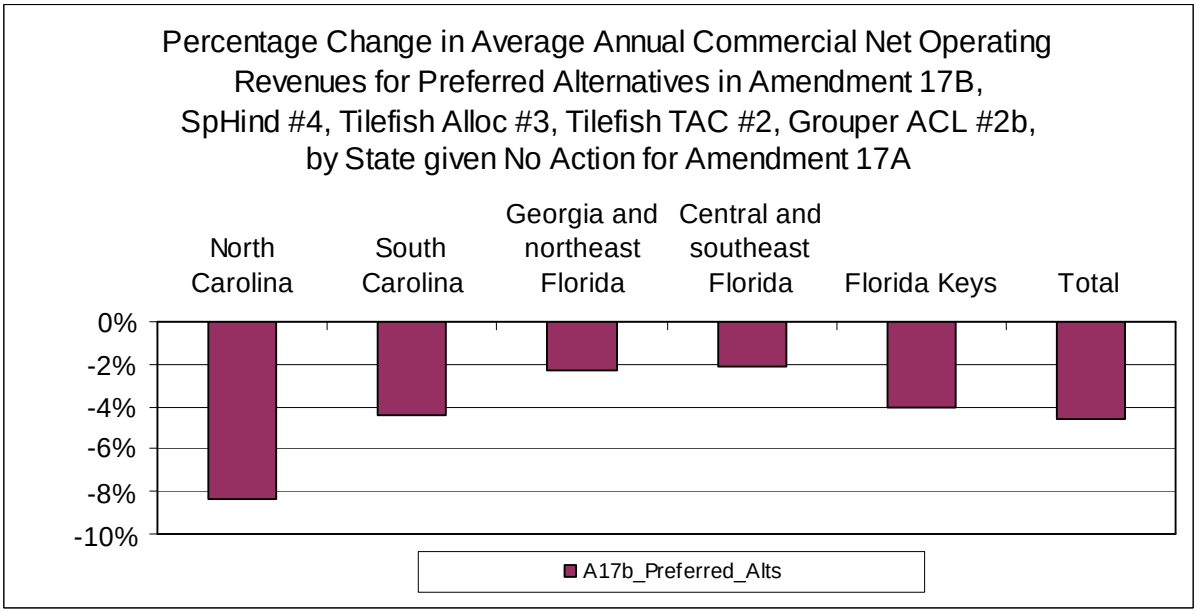


Figure 13b. Predicted percentage change in commercial net operating revenues by state of landing for all preferred alternatives combined compared to the No-Action alternative for Amendment 17B.



Summary

This report described the results of a simulation model that calculated the expected economic effects of management alternatives proposed in Amendment 17B for the commercial snapper-grouper fishery. Alternatives were evaluated that would establish annual catch limits for speckled hind, warsaw grouper, golden tilefish, red grouper and black grouper. The results were compared to a baseline scenario defined by management conditions that were implemented recently by Amendments 13C and 16.

The simulation results suggest that most of the proposed management alternatives that were evaluated would not have major *additional* economic effects when compared to the no-action alternative for the entire commercial snapper-grouper fishery, *after accounting for the expected effects of Amendments 13C and 16.* This is because Amendment 17B would not impose additional regulations for the commercial harvest of high-volume species such as vermilion snapper, yellowtail snapper and gag.

Average annual net operating revenues to boat owners and crew after deducting trip costs would decline from $8.78 million in constant 2008 dollars to approximately $8.38 million with the preferred management alternatives for speckled hind, warsaw grouper, tilefish, red grouper and black grouper. The average annual difference of -$0.40 million between the No Action and Preferred management scenarios represents a 4.6% average annual short-term economic loss that would be incurred by the commercial snapper-grouper fishery. On average, approximately 72% of the overall, expected annual reduction in net operating revenues would occur in response to the prohibition on the harvest and landing of deep water groupers and snappers and blueline tilefish in waters deeper than 240 feet. Approximately 26% of the expected annual reduction would occur in response to the aggregate ACL for red grouper, black grouper and gag, and the remaining 2% reduction is expected in response to a lower ACL for tilefish.

The analysis evaluated the economic effects of proposed alternatives for each management action given the No-Action alternative for other actions, as well as the simultaneous effects of all preferred alternatives for the various actions in Amendment 17B. In addition, the management alternatives in Amendment 17B could interact with additional alternatives that are simultaneously being developed in Amendment 17A to manage fishing activity in areas with large concentrations of red snapper. The simultaneous evaluation of preferred alternatives from the two amendments can occur later when preferred alternatives are specified for all Actions in both amendments.

Appendix M

Methodology and Assumptions in Estimating the Economic Effects of the South Atlantic Snapper Grouper Amendment 17B on the Recreational Sector

Antonio Lamberte, NMFS SERO

January 2010

1.0 Introduction

The South Atlantic Fishery Management Council has developed Snapper Grouper Amendment 17B to consider establishing annual catch limits (ACLs), accountability measures (AMs), and annual catch targets (ACTs) for certain species. The alternatives considered in this amendment are summarized below.

Speckled Hind and Warsaw Grouper

Alternative 1: no action

Alternative 2: ACL = 0 for speckled hind and Warsaw grouper; prohibit commercial and recreational fishing for speckled hind and Warsaw grouper.

Alternative 3: ACL = 0 for speckled hind and Warsaw grouper; prohibit commercial and recreational fishing for co-occurring deepwater species (speckled hind, Warsaw grouper, snowy grouper, yellowedge grouper, misty grouper, blueline tilefish, queen snapper, and silk snapper).

Preferred Alternative 4: ACL = 0 for speckled hind and Warsaw grouper; prohibit commercial and recreational fishing for co-occurring deepwater species beyond a depth of 240 feet.

Alternative 5: ACL = 0 for speckled hind and Warsaw grouper; prohibit commercial and recreational fishing for co-occurring deepwater species beyond a depth of 300 feet.

Golden Tilefish Allocation

Alternative 1: no action.

Alternative 2: 96% commercial, 4% recreational allocation based on 2006-2008 landings.

Preferred Alternative 3: 97% commercial, 4% recreational allocation based on 2006-2008 landings (50% weight) and 1986-2008 landings (50% weight).

Alternative 4: 50% commercial, 50% recreational allocation.

Golden Tilefish ACLs and AMs

Alternative 1: no action

Preferred Alternative 2: commercial ACL (quota) = 282,819 lbs gutted weight; recreational ACL = 1,578 fish (8,747 gutted weight); commercial AM is to close the fishery upon reaching the ACL; recreational AM is to reduce the length of the following fishing year when the current ACL is met.

Alternative 3: single commercial and recreational ACL = 291,566 lbs gutted weight; AM is to close the fishery for the commercial and recreational sectors upon reaching the ACL.

Alternative 4: recreational AM = 1 golden tilefish per vessel per day upon reaching the single

commercial and recreational ACL of 291,566 lbs gutted weight.

Alternative 5: single commercial and recreational ACL = 282,819 lbs gutted weight; AM for both commercial and recreational sectors is to close the fishery when commercial landings exceed the ACL.

Snowy Grouper

Alternative 1: no action.

Preferred Alternative 2: recreational daily bag limit of 1 snowy grouper per vessel; recreational AM is to reduce the following year's fishing season when the ACL is met in the current year; compare recreational ACL with recreational landings over a range of years.

Alternative 3: commercial and recreational ACL = 87,254 lbs gutted weight (current TAC); AM is to close the fishery to the commercial and recreational sectors when the ACL is met.

Alternative 4: ACL = 82,900 lbs gutted weight (commercial quota); commercial sector AM is to close the fishery when the ACL is met; recreational sector AM is 1 snowy grouper per vessel per day when the ACL is met.

Black Grouper, Black Sea Bass, Gag, Red Grouper, and Vermilion Snapper

Alternative 1: no action.

Alternative 2: establish commercial and recreational ACL:

Alternative 2a: commercial ACL = 86,886 lbs gutted weight for black grouper; commercial ACL = 221,577 lbs gutted weight for red grouper; recreational ACL = 31,863 lbs gutted weight for black grouper; recreational ACL = 276,740 lbs gutted weight for red grouper.

Preferred Alternative 2b: commercial ACL = 353,940 lbs gutted weight for gag; aggregate commercial ACL = 662,403 lbs gutted weight for gag, black grouper, and red grouper; recreational ACL = 340,060 lbs gutted weight for gag; aggregate recreational ACL = 648,663 lbs gutted weight for gag, black grouper, and red grouper; commercial AM is to close the shallow waters grouper fishery when either the ACL for gag or the aggregate ACL for gag, black grouper, and red grouper is met.

Alternative 3: establish ACT for the recreational sector:

Alternative 3a: ACT = 85% of recreational ACL.

Alternative 3b: ACT = 75% of recreational ACL.

Alternative 3c: ACT = (1-PSE)ACL or 50% of recreational ACL, whichever is greater.

Preferred Alternative 4: compare recreational ACL with recreational landings using only 2010 landings for 2010, average 2010 and 2011 landings for 2011, and 3-year running landings average for 2012 and beyond.

Alternative 5: implement recreational AM for black grouper, black sea bass, gag, red grouper, and vermilion snapper:

Alternative 5a: regardless of stock status, reduce the following year's fishing season when the ACL is met in the current year.

Preferred Alternative 5b: if a species is overfished, close the fishery for the species or species group upon reaching its ACL; regardless of stock status, reduce the following year's fishing season when the ACL is met in the current year.

Alternative 5c: if a species is overfished, close the fishery for the species or species

group upon reaching its ACT; reduce the following year's ACT for the species or species group when its ACT is reached in the current year.

The procedure for calculating the economic effects of these alternatives on the recreational sector involves estimating the expected changes in consumer surplus (CS) to anglers and net operating revenues (NOR) to for-hire vessels. This procedure follows the method employed in other snapper grouper plan amendments (Amendments 15A, 16, and 17A) and the red snapper interim rule (NMFS 2008b). It also draws upon the general method used in the economic analysis for the red snapper fishery closure in the Gulf of Mexico (NMFS 2008a). Data, averaged over the years 2005-2008, were used in estimating the economic effects of this amendment. The period 2005-2008 was chosen per agreement among the members of the Interdisciplinary Planning Team. In this document, the economic values are in 2009 dollars.

2.0 Method for Estimating the Expected Economic Effects

The expected change in CS was estimated using the following equation:

(1) $$\Delta(CS)_{i,j} = \Delta(TTRIP)_{i,j} \times (CS)_{0,0} \times (FISH)_{i,j}$$

where $\Delta(CS)_{i,j}$ is the change in consumer surplus for species or species group *i* using fishing mode *j* (charterboat, headboat, private). $\Delta(TTRIP)_{i,j}$ is the change in target trips per angler for species *i* using fishing mode *j*. $(CS)_{0,0}$ is the per angler, per target trip consumer surplus of keeping (landing) one fish. $(FISH)_{i,j}$ is the average fish kept per angler, per targeted trip of species *i* using fishing mode *j*. It may be noted that TTRIP and FISH are 2005-2008 averages.

CS in the present case 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 the appropriate measure of economic effects on recreational anglers as a result of changes in fishing regulations. For the current analysis, the CS of keeping one fish per angler trip ($CS_{0,0}$) was assumed constant across species and modes. Further, this value was assumed to remain constant and unaffected by changes in target trips resulting from changes in regulations.

The expected change in for-hire NOR was estimated using the following equation:

(2) $$\Delta(NOR)_{i,j} = \Delta(TTRIP)_{i,j} \times (NOR)_{0,j}$$

where $\Delta(NOR)_{i,j}$ is the change in net operating revenues for species or species group *i* using fishing mode *j* (charterboat, headboat). $\Delta(TTRIP)_{i,j}$ is the change in target trip per angler for species *i* using fishing mode *k*. $(NOR)_{0,j}$ is the baseline net operating revenue per angler target trip using mode *j* (charter, headboat).

NOR is the net operating revenue, expressed on a per angler basis, a charterboat or headboat derives from a fishing trip. NOR was calculated as revenue minus the costs for fuel, ice, bait, and other supplies. Producer surplus is the appropriate measure of economic effects on for-hire operations as a result of changes in fishing regulations. Estimates of the average producer

surplus for for-hire operations are not available, and this analysis used NOR as a proxy value. In the current analysis, NOR per angler trip was assumed constant across species but not across modes (charterboat and headboat). In addition, this value was assumed to be invariant to changes in the number of angler target trips resulting from changes in fishing regulations.

In assessing the economic effects of each alternative, the change in target trips [$\Delta(TTRIP)_{i,j}$] was first estimated, followed by the use of equation (1) to generate the expected change in CS and equation (2) to generate the expected change in NOR. The change in target trips was estimated by assuming cancellation of all target trips for the particular species. This approach would overestimate the economic effects if anglers continue fishing but shift their effort to target other species.

3.0 Data, Parameters, and Assumptions

The basic parameters used in estimating the economic effects of Amendment 17B were recreational angler target effort, angler consumer surplus, average fish kept per angler trip, and for-hire vessel net operating revenues.

3.1 Headboat Angler Target Trips

The headboat data does not contain information collected at the angler level, nor does it collect target intent information. Therefore, an alternative approach was used to estimate angler target effort. Since the 1980s, NMFS (Beaufort) has conducted surveys of the headboat sector and has generated a measure of fishing effort in terms of angler days. The method of deriving total angler days from survey reports is a complex process. Here is a brief description of the process from the "Review of Headboat Survey, Questions and Answers" (NMFS 2004):

> *"First, reported effort is calculated from catch records. The term "reported" refers to data actually provided by the vessel personnel in the form of catch records. Data on effort are provided as number of anglers on a given trip. Numbers of anglers are standardized, depending on the type of trip (length in hours), by converting number of anglers to "angler days" (e.g., 40 anglers on a half-day trip would yield 40 * 0.5 = 20 angler days). Angler days are summed by month for individual vessels. Port agents enter the reported anglers from catch records on an internal worksheet called a headboat activity report (HAR). The reported anglers are converted to angler days and totaled. The monthly total of angler days is referred to as catch record angler days (CRADs). We then take every piece of information recorded on the HAR for that vessel for that month and use them to calculate estimated angler days, or EADs. This is the adjustment for non-reporting. This expansion to arrive at estimated angler days is often complex and usually labor intensive. If there is complete reporting by vessel personnel, i.e., a catch record submitted for every trip made, then CRAD=EAD and the process is simple. More often that not, however, there are varying degrees of incompleteness of reporting. The usual estimation procedure involves using sampler observations of activity and developing an adjustment ratio to expand the reported observations."*

The EADs noted above are for all headboat activities and are not broken down into EADs for specific species. For the current analysis, all headboat angler days (EADs) were assumed to be target angler trips for snapper grouper species. This assumption is expected to overestimate snapper grouper target trips, because some headboat anglers may not target any species while

others target species other than those considered Amendment 17B (e.g., mackerel, dolphin).

In estimating headboat target angler trips for a particular species, the following formula was used:

$$(3) \qquad (TTR)_i = \{ \frac{LAND_i}{LAND_{sg}} \} \times (EAD)$$

where $(TTR)_i$ is angler target trips for a particular species or species group, $(LAND)_i$ is the landings of species or species group *i*, $(LAND)_{sg}$ is total landings of snapper grouper, and (EAD) is the estimated total angler days.

For speckled hind, Warsaw grouper, and co-occurring deepwater species, equation (3) was applied on average 2005-2008 data by state in the South Atlantic and the results summed across states to arrive at angler target trips for this species group. For each of the snowy grouper and black sea bass species, equation (3) was applied on average 2005-2008 monthly data for all states in the South Atlantic. Monthly estimates were generated for snowy grouper and black sea bass since the ACLs/AMs for these species implied fishery closures for part of the year. Headboats recorded no landings of golden tilefish.

3.2 Charter and Private Target Trips

The number of target trips for a species or species group was calculated using the methods described in Holiman (1996), as modified by SEFSC and SERO staff. For snowy grouper, Warsaw grouper, and co-occurring deepwater species, target trips were calculated for each of the four states in the South Atlantic using average 2005-2008 data. The results were then summed across states to arrive at target trips for the species group. For golden tilefish, snowy grouper, and black sea bass, target trips were calculated using average 2005-2008 monthly data. Monthly estimates were generated for these species since their respective ACL/AM implied fishery closures for part of the year. Data for each MRFSS wave were equally divided between the two months comprising each wave.

3.3 Estimated Target Trips

Table A1 below presents the estimate target trips for the charter, headboat, and private/rental fishing modes. As discussed above, only the total target trips were calculated for deepwater species while monthly target trips were calculated for the other species.

Table A1. Average angler target trips, by mode, 2005-2008.

Deepwater Species*													
Chtr.													290
Head.													963
Priv.													1,566
Golden Tilefish													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Chtr.	0	0	0	0	38	38	0	0	27	27	0	0	131

Head.	0	0	0	0	0	0	0	0	0	0	0	0	0
Priv.	161	161	0	0	0	0	0	0	89	89	0	0	499
Snowy Grouper													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Chtr.	0	0	0	0	61	61	0	0	0	0	0	0	122
Head.	9	15	8	14	13	8	5	4	10	7	1	0	94
Priv.	0	0	0	0	0	0	0	0	5	4	0	0	9
Black Sea Bass**													
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Ch.	810	492	492	259	259	106	106	5	5	305	305	968	4,111
Head.	2,225	4,220	3,030	897	878	804	1,133	901	974	2,656	3,108	2,019	22,844
Priv.	6,884	5,331	5,331	3,474	3,474	4,115	4,115	734	734	5,780	5,780	5,354	51,106

*Deepwater species include speckled hind, Warsaw grouper, snowy grouper, blueline tilefish, yellowedge grouper, misty grouper, queen snapper, and silk snapper.
**Fishing year for black sea bass starts in June.

3.4 Average Fish Landed

Table A.2 presents the 2005-2008 average fish landed per angler target trip by fishing mode. These numbers were derived by assigning all landed fish to target trips, that is, total landed fish divided by total target trips by fishing mode. In modes where landed fish far exceeded the number of target trips, the averages would be relatively high. Conversely, where the number of target trips far exceeded the number of fish landed, the averages would be relatively low. To some extent, this method of assigning all landed fish to target trips would mitigate the potential overestimation/underestimation of changes in CS due to overestimation/underestimation of target trips.

Table A.2. Average fish landed per angler target trip, by mode, 2005-2008.

	Deepwater Species	Golden Tilefish	Snowy Grouper	Black Sea Bass
Chtr.	18	13	46	18
Head.	2	0	2	7
Priv.	13	9	20	9

3.5 Consumer Surplus and Net Operating Revenues

Estimates of recreational CS and for-hire NOR were derived by the SEFSC based on several studies (NMFS 2009a). For the current amendment, a CS value of $80, charter NOR value of $128, and headboat NOR value of $68 were chosen because these are based on a more recent study using data collected from a South Atlantic state (Dumas et al. 2009). These values are expressed in 2009 dollars.

4.0 Results

Estimates of the expected short-term reductions in consumer surplus and net operating revenues are presented in the four tables below. Only some alternatives are presented because the

economic effects of the other alternatives cannot be quantified with available information. However, some qualitative discussions are presented to gauge the relative magnitude of the economic effects of those other alternatives.

Shown in Table A.3 are the economic effects of Alternative 3 for the ACL/AM for speckled hind, Warsaw grouper, and other co-occurring deepwater species. Alternative 2 would have smaller economic effects than Alternative 3, because it would not affect fishing for other co-occurring deepwater species. Alternative 4 would have smaller economic effects than Alternative 3, because it would affect fishing for other co-occurring deepwater species only beyond a depth of 240 feet. Alternative 5 would have smaller economic effects than either Alternative 3 or Alternative 4 as it would affect fishing for other co-occurring deepwater species beyond a depth of 300 feet.

Table A.3. Economic effects of Alternative 3 for deepwater species, in 2009 dollars.

	Charterboats	Headboats	Private/Rental	Total
CS	$3,961,980	$159,520	$1,683,400	$5,804,900
NOR	$37,088	$65,484		$102,572
Total	$3,999,068	$225,004	$1,683,400	$5,907,472

Table A.4 presents the economic effects of the ACL/AM for golden tilefish, giving consideration to the commercial/recreational allocation of 96/4 and 97/3. A 50/50 commercial/recreational allocation was not used because of the difficulty in estimating the number of additional recreational trips that may occur due to a significant increase in recreational allocation. There is also the added issue of whether recreational trips could increase given the relatively restrictive bag limit on golden tilefish. Alternative 4 would result in smaller economic effects than Alternative 3 as the fishery would remain open year round, although at very restrictive bag limit of 1 fish per vessel per day once the ACL specified in Alternative 3 is met. It may also be noted that the AM for Alternative 2 would apply only in the fishing season following the year the ACL is met.

Table A.4. Economic effects of Alternatives 2, 3, and 5 for golden tilefish, in 2009 dollars.

	Charterboats	**Private/Rental**	**Total**
	*Alternative 2: ACL of 9,796 lbs ww; closure starts in July**		
CS	$55,670	$132,922	$188,592
NOR	$7,008		$7,008
Total	$62,678	$132,922	$195,600
	*Alternative 2: ACL of 13,062 lbs ww; closure starts in August**		
CS	$55,670	$132,922	$188,592
NOR	$7,008		$7,008
Total	$62,678	$132,922	$195,600
	Alternative 3: single ACL of 326,554 lbs ww; closure starts in October		
CS	$27,835	$66,461	$94,296
NOR	$3,504		$3,504
Total	$31,339	$66,461	$97,800
	Alternative 5: single ACL of 321,003 lbs ww; closure starts in September		
CS	$55,670	$132,922	$188,592

NOR	$7,008		$7,008
Total	$62,678	$132,922	$195,600

*The AM for Alternative 2 involves a reduction in fishing season the following year and not an immediate fishery closure.

The economic effects of the alternatives for snowy grouper are presented in Table A.5. In determining the economic effects of Alternative 2, it was assumed that the AM of 1 snowy grouper per vessel per day would effectively constrain the fishery to its ACL, which is about 62 percent of the 2005-2008 average recreational landings of snowy grouper. It is worth noting that the AM under Alternative 2 would apply only in the fishing season following the year the ACL is met. For Alternative 4, it was assumed that once the daily bag limit of 1 fish per vessel became effective (determined to be in September), it would have the same proportional effect on recreational trips as in Alternative 2. That is, 38 percent of the September through December recreational trips would be affected by bag limit.

Table A.5. Economic effects of Alternatives 2, 3, and 4 for snowy grouper, in 2009 dollars.

	Charterboats	Headboats	Private/Rental	Total
	*Alternative 2**			
CS	$143,962	$4,800	$49,920	$198,682
NOR	$4,992	$2,040		$7,032
Total	$148,954	$6,840	$49,920	$205,714
	Alternative 3			
CS	$224,480	$5,600	$48,240	$278,320
NOR	$7,808	$2,380		$10,188
Total	$232,288	$7,980	$48,240	$288,508
	Alternative 4			
CS	$143,667	$2,458	$46,310	$192,435
NOR	$4,997	$1,044		$6,042
Total	$148,664	$3,502	$46,310	$198,477

*The AM for Alternative 2 involves a reduction in fishing season the following year and not an immediate fishery closure.

The ACL/AM for gag, black grouper, red grouper, and vermilion snapper were determined to have no effects on the recreational sector, since the various ACL options were based on expected landings from the implementation of previous amendments for these species. Although the ACL for black sea bass was established in a previous amendment, the AM affecting this species would be part of Amendment 17B. This AM would result in economic effects presented in Table A.6. The tabulated economic effects, however, are deemed to be overestimates of the true economic effects for a variety of reasons. For one, recreational landings of black sea bass have been trending downwards most likely due to the restrictive regulations implemented in 2006. Landings averaged over 2005-2008 would not effectively capture the noted downward trend in landings. Overestimation could also be due to the method used in estimating the target effort for headboats. In the absence of species-specific headboat angler trips, total angler trips were adjusted using the ratio of black sea bass landings to total snapper grouper landings of headboats to arrive at estimates of headboat angler trips for black sea bass. Moreover, there is the issue of effort shifting which was not taken into account in the estimating the economic effects of the

proposed regulation affecting black sea bass.

Table A.6. Economic effects of ACL/AM for black sea bass (Alternative 5b), in 2009 dollars.

	Charterboats	Headboats	Private/Rental	Total
CS	$2,286,705	$5,507,964	$13,393,573	$21,188,241
NOR	$203,456	$656,717		$860,173
Total	$2,490,161	$6,164,681	$13,393,573	$22,048,414

The alternatives for updating the framework procedure for specification of total allowable catch were determined to have no short-run economic effects.

5.0 Discussion and Caveats

The following provides some discussion and caveats on the model and assumptions, in addition to those already noted in the preceding section. These are not listed in any implied order of importance.

a. MRFSS target trips – there are several potential measures of effort and thus of trips potentially affected by this amendment. Effort may be measured, generally in ascending magnitude, as target trips, harvest trips, catch trips, and directed trips. Target trips are those trips for which the angler stated a specific primary or secondary target species. Harvest trips are those trips for which the recreational catch was comprised of Types A or B1 fish. Type A refers to fish that were caught, landed whole, and available for identification and enumeration by the interviewers. Type B1 refers to fish that were caught and filleted, released dead, given away, or disposed of in some way other than being landed or released alive. Catch trips are those trips which caught the species and for which the recreational catch was comprised of Types A, B1, and B2 fish. Type B2 refers to fish caught and released alive. Directed trips are a combination of two or more of the other trips noted above but are generally a combination of target and catch trips. The use of target trips in estimating economic effects is premised on the contention that these trips are closely related to recreational angler expectations and thereby carries more information generally embodied in angler demand functions (demand studies, and the estimated values they produce, generally are based on target trips). The other types of trip, particularly the directed trips, may also be relevant for economic analysis since they embody both intent and the fact that anglers caught the species of interest. The use of target trips may not fully capture the economic effects of this amendment. However, the use of other types of trips (i.e., non-target trips) would probably result in lower estimates of the value per trip or per fish as someone less interested in catching a particular species would be expected to value that species less.

b. Headboat target trips – unlike MRFSS, the headboat survey does not collect target intent information. Target trips (TTR) were derived using equation (3). Using the

ratio of landings of a species or species group to total landings of snapper grouper as an adjustment factor to derive the target trips for the species or species group may tend to inflate target trip estimates. A highly sought after species may not be as abundant as the less sought after species, yet the derived target trips would be less for the much sought after species because landings for this species would likely be low. In addition, total headboat angler trips are relatively large numbers so that even a small ratio would come up with relatively large number of target trips. In addition, overestimation of affected target trips would also result if anglers who normally catch or expect to catch a regulated species chose some other species to target.

c. Average fish landed – considering the various types of trips discussed above, there is no one-to-one correspondence between landed fish and target trips. Some species of fish are landed without being targeted and some target trips do not catch the targeted species. Under the methodology of assigning economic values to target trips only and of putting an economic value to each fish landed, the derivation of average fish per angler target trip resulted in very low numbers in some cases and very high numbers in others. To some extent, this approach would compensate for over- and under-estimation of target trips in calculating the changes in CS due to the various alternatives. But since the methodology was consistently applied across all alternatives, the ranking of alternatives would not be affected.

d. Consumer surplus (CS) – a value of $80 (2009 dollars) per fish, per angler, per trip was used for this amendment. This value is for a snapper grouper trip and is derived from a study conducted in North Carolina (Dumas et al. 2009). Other estimates are provided by other studies, some higher and others lower. The value used was chosen because it was derived from a study using more recent data collected from a state in the South Atlantic. The chosen value is comparable to the values used in earlier amendments and is also close, on average, to the value generated in a recent study re-analyzing earlier survey data. It should be noted that the use of a constant value of consumer surplus across all areas and fishing modes does not take into account possible differences in valuation across areas and modes. In addition, the value used is based on an estimate of a unit increase in targeted catch and keep and, thus, may not fully reflect the CS loss when the fishery for a species is closed, or certain areas are closed to fishing for the species. However, because the value and methodology was used consistently across all alternatives, the ability to rank alternatives should not be affected.

e. Net operating revenue (NOR) – The values of $128 and $68, respectively, for charter and headboat NOR per angler trip were used in this amendment. Other estimates are provided by other studies, some higher and others lower. The NOR values used were chosen because they were derived from a study using more recent data collected from a state in the South Atlantic (Dumas et al. 2009). The values used are comparable to the values used in earlier amendments as well as to the values from other studies. In addition, the use of these values as opposed to other values should not affect the ranking of alternatives and the relative distribution of changes in NOR. However, it is noted that the use of these values does not take into account differences in charter and headboat operations by area.

f. Economic effects – the economic effects of the various alternatives were estimated under the assumption that the affected trips would be cancelled. This assumption would rule out the possibility that anglers may opt to target other species in the affected areas or snapper grouper species in areas that remain open. This assumption, however, should not alter the ranking of alternatives or the distribution of economic effects by mode, unless the likelihood of these behaviors differs by alternative.

g. Period of analysis – although the proposed alternatives would establish management measures that would remain in effect for a number of years until lifted or replaced by other management measures, the estimated economic effects of the alternative prohibitions represent single year, annual effects. As such, they would be expected to re-occur in each subsequent year. However, as the measures remain in effect, anglers and fishing businesses would be expected to adapt to these measures, with anglers learning to target alternative species and for-hire operations developing new services or different for-hire experiences to offer, thereby reducing the adverse effects in subsequent years. However, it is noted that some anglers may elect to substitute completely different recreational activities and some fishing businesses may not be able to adequately adapt to the new regulations and survive as viable business operations.

h. Effects of recent and pending amendments – several amendments have been recently implemented, are in the process of being implemented, or are being currently considered. The effects of these amendments are not explicitly considered in estimating the economic effects of this current amendment. The overall economic effects of this amendment may be less than described if the effects of these other amendments reduce the baseline of the fishery from that used in this analysis. While such would not affect the cumulative effect of all these amendments, the incremental effect of this amendment would be reduced.

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