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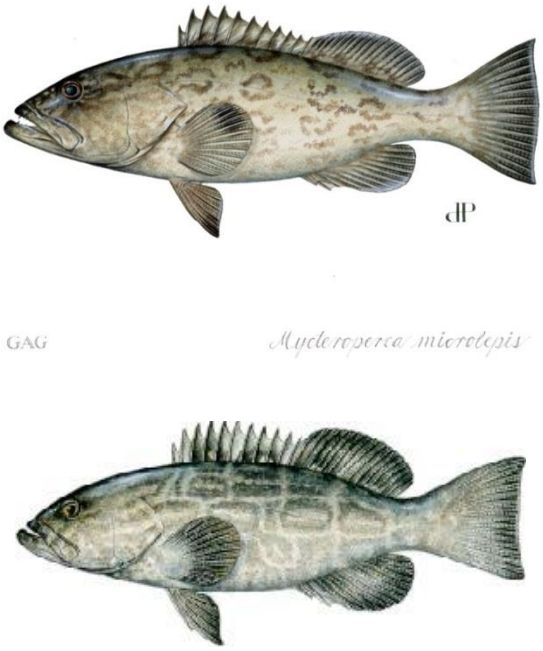
Modifications to Gag Minimum Size Limits, Recreational Season and Black Grouper Minimum Size Limits



Framework Action to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico

Including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis

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ENVIRONMENTAL ASSESSMENT COVER SHEET

Name of Action

Framework Action to Modify Gag Minimum Size Limits and Recreational Season, and Black Grouper Minimum Size Limits

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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
AM	accountability measure
AP	advisory panel
CEA	cumulative effects analysis
CEQ	Council on Environmental Quality
Council	Gulf of Mexico Fishery Management Council
CPUE	catch-per-unit-effort
CS	consumer surplus
CZMA	Coastal Zone Management Act
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	environmental impact statement
EJ	environmental justice
E.O.	Executive Order
ESA	Endangered Species Act
FEIS	final environmental impact statement
FMP	fishery management plan
FWCC	Florida Fish and Wildlife Conservation Commission
GMFMC	Gulf of Mexico Fishery Management Council
Gulf	Gulf of Mexico
gw	gutted weight
HAPC	habitat area of particular concern
IFQ	individual fishing quota
IRFA	initial regulatory flexibility analysis
km^2	square kilometers
LNG	liquefied natural gas
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MMPA	Marine Mammal Policy Act
MOU	memorandum of understanding
mp	million pounds
MRFSS	Marine Recreational Fisheries Statistics Survey
MRIP	Marine Recreational Information Program
MSST	minimum stock size threshold
NEPA	National Environmental Protection Act
nm^2	square nautical miles
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOR	net operating revenue

NRFCC	National Recreational Fisheries Coordination Council
OFL	overfishing limit
OY	optimum yield
PS	producer surplus
RDT	recreational decision tool
RFA	Regulatory Flexibility Act
RIR	regulatory impact review
SEDAR	Southeast Data, Assessment, and Review process
SEFSC	Southeast Fisheries Science Center
SERO	NMFS Southeast Regional Office
SFA	Sustainable Fisheries Act
SRHS	Southeast region headboat survey
SSB	spawning stock biomass
SSC	Scientific and Statistical Committee
TAC	total allowable catch
TL	total length
USFWS	U.S. Fish and Wildlife Service
VEC	valued environmental components
WTP	willingness to pay

TABLE OF CONTENTS

Environmental Assessment Cover Sheet iii
Abbreviations Used in this Document iv
List of Tables viii
List of Figures x
Chapter 1. Introduction 1
1.1 Background 1
1.2 Purpose and Need 4
1.3 History of Management 4
1.4 Gag ACL and ACT 8
Chapter 2. Management Alternatives 12
2.1 Action 1 – Gag Recreational Minimum Size Limit 12
2.2 Action 2 – Black Grouper Recreational Minimum Size Limit 15
2.3 Action 3 – Modifications to the Recreational Gag Fishing Season 17
Chapter 3. Affected Environment 21
3.1 Description of the Physical Environment 22
3.2 Description of the Biological/Ecological Environment 25
3.3 Description of the Economic Environment 31
3.4 Description of the Social Environment 45
Environmental Justice Considerations 48
3.5 Description of the Administrative Environment 50
Chapter 4. Environmental Consequences 52
4.1 Action 1 - Gag Recreational Minimum Size Limit 52
4.1.1 Direct and Indirect Effects on the Physical Environment 52
4.1.2 Direct and Indirect Effects on the Biological/Ecological Environment 54
4.1.3 Direct and Indirect Effects on the Economic Environment 54
4.1.4 Direct and Indirect to the Social Environment 56
4.1.5 Direct and Indirect Effects on the Administrative Environment 57
4.2 Action 2 – Black Grouper Recreational Minimum Size Limit 57
4.2.1 Direct and Indirect Effects on the Physical Environment 57
4.2.2 Direct and Indirect Effects on the Biological/Ecological Environment 58
4.2.3 Direct and Indirect Effects on the Economic Environment 59
4.2.4 Direct and Indirect Effects on the Social Environment 59
4.2.5 Direct and Indirect Effects on the Administrative Environment 60

4.3 Action 3 – Modifications to the Recreational Gag Fishing Season 61
4.3.1 Direct and Indirect Effects on the Physical Environment 62
4.3.2 Direct and Indirect Effects on the Biological/Ecological Environment 63
4.3.3 Direct and Indirect Effects on the Economic Environment 64
4.3.4 Direct and Indirect Effects on the Social Environment 67
4.3.5 Direct and Indirect Effects on the Administrative Environment 70
4.4 Cumulative Effects Analysis (CEA) 71
Chapter 5. Regulatory Impact Review 74
5.1 Introduction 74
5.2 Problems and Objectives 74
5.3 Description of Fisheries 74
5.4 Impacts of Management Measures 74
5.4.1 Action 1 - Gag Recreational Minimum Size Limit 74
5.4.2 Action 2 - Black Grouper Recreational Minimum Size Limit 75
5.4.3 Action 3 – Modifications to the Recreational Gag Fishing Season 75
5.5 Public and Private Costs of Regulations 76
5.6 Determination of Significant Regulatory Action 76
Chapter 6. Regulatory Flexibility Act Analysis 77
6.1 Introduction 77
6.2 Statement of the need for, objective of, and legal basis for the proposed action 77
6.3 Description and estimate of the number of small entities to which the proposed action would apply 78
6.4 Description of the projected reporting, record-keeping and other compliance requirements of the proposed action 78
6.5 Identification of all relevant federal rules, which may duplicate, overlap or conflict with the proposed action 79
6.6 Significance of economic impacts on a substantial number of small entities 79
6.7 Description of the significant alternatives to the proposed action 80
Chapter 7. Other Applicable Law 81
Chapter 8. List of Preparers 89
Chapter 9. List of Agencies Consulted 90
Chapter 10. References 91
Appendix A – Alternatives Considered but Rejected 102
Appendix B – Description of Recreational Closure Analysis 104

LIST OF TABLES

Table 1.1.1. Gag recreational landings by region, 2010-2014 in lbs gw. 3

Table 1.1.2. Black grouper recreational landings by region, 2010-2014 in lbs gw. 3

Table 1.3.1. Gag ACL, ACT and actual landings in mp gw for 2009-2014. 8

Table 1.4.1. Gag acceptable biological catch (ABC), ACL, and annual catch target (ACT) for 2015 from the gag rebuilding plan (Amendment 32). 8

Table 1.4.2. OFL, ABC, and OY projections for gag based on SEDAR 33 benchmark assessment and assuming no red tide mortality in 2014. 10

Table 2.1.1. Gag size (inches TL) at age (years) based on growth function in SEDAR 33..... 14

Table 2.1.2. Calculated average depth of released gag by fishing fleet and associated discard mortality rate estimate..... 14

Table 2.2.1. Black grouper size (inches TL) at age (years) based on growth function (in SEDAR 19) 16

Table 2.2.2. State recreational minimum size limits for gag and black grouper in inches TL ... 16

Table 2.3.1. Estimated gag recreational seasons under combinations of Action 1 size limits and Action 3, Alternative 3 options. 20

Table 2.3.2. Estimated gag recreational seasons under combinations of Action 1 size limits and Action 3, Alternative 4 options. 20

Table 3.2.1. Species of the Reef Fish FMP grouped by family. 28

Table 3.3.2.1. Recreational landings in pounds (lbs) gutted weight (gw) and percent distribution of gag across all modes, by state, 2010 – 2014. 32

Table 3.3.2.2. Recreational landings (lbs gw) and percent distribution of gag across all states, by mode, 2010 - 2014. 32

Table 3.3.2.3. Recreational landings (lbs gw) and percent distribution of gag, by wave, 2010-2014..... 33

Table 3.3.2.4. Recreational landings (lbs gw) and percent distribution of black grouper across all states, by mode, 2010 - 2014. 33

Table 3.3.2.5. Number of gag recreational target trips, by mode and state, 2010-2014 35

Table 3.3.2.6. Number of gag recreational catch trips, by mode and state, 2010-2014..... 36

Table 3.3.2.7. Gag target trips and percent distribution across all modes and states, by wave, 2010 – 2014..... 37

Table 3.3.2.8. Gag catch trips and percent distribution across all modes and states, by wave, 2010 – 2014..... 38

Table 3.3.2.9. Black grouper recreational target trips, by mode and state, 2010-2014..... 39

Table 3.3.2.10. Black grouper recreational catch trips, by mode and state, 2010-2014 40

Table 3.3.2.11. Headboat angler days and percent distribution, by state, 2010 - 2014 41

Table 3.3.2.12. Headboat angler days and percent distribution, by month, 2010 - 2014..... 42

Table 3.3.2.13. Summary of gag target trips (2010-2014 average) and associated business activity (2014 dollars) 45

Table 4.1.3.1. Estimated landings and decreases in number of fish harvested and consumer surplus (by mode) relative to Alternative 1 (no action) 55

Table 4.3.3.1 Estimated season length and changes in CS for alternative gag recreational fishing seasons assuming accountability measures are in effect* 65

Table 4.3.3.2 Estimated season length and changes in CS for alternative gag recreational fishing seasons assuming accountability measures are not in effect*. 66

Table 4.3.4.1. Estimated gag recreational seasons based on the ACL 69

LIST OF FIGURES

Figure 1.1.1. Inter-Council jurisdiction boundary between the Gulf of Mexico and South Atlantic Councils 2
Figure 1.4.1. Expected recruitment anomalies for northeastern Gulf of Mexico gag grouper by year based solely on the effects of oceanographic conditions 11
Figure 3.1. Physical environment of the Gulf including major feature names and mean annual sea surface temperature as derived from the Advanced Very High Resolution Radiometer Pathfinder Version 5 sea surface temperature data set 21
Figure 3.1.1. Map of most fishery management closed areas in the Gulf. 24
Figure 3.4.1. Top 16 recreational fishing communities' engagement and reliance. 48
Source: SERO, Social indicators database (2012). 48
Figure 3.4.2. Social vulnerability indices for recreational fishing communities 49
Figure B-1. Gulf of Mexico gag recreational landings by wave 105

CHAPTER 1. INTRODUCTION

1.1 Background

In 2009 a gag update assessment under the Southeast Data, Assessment and Review (SEDAR) program (SEDAR 10 Update 2009) indicated the gag stock size had declined since 2005. A large part of the decline was attributed to an episodic mortality event in 2005 (most likely associated with red tide) that resulted in 18% of the gag stock being killed in addition to the normal natural and fishing mortalities. The update assessment indicated the Gulf gag stock was both overfished and undergoing overfishing, and the Gulf of Mexico Fishery Management Council (Council) was informed of this status determination in August 2009. In response, an interim rule was implemented on January 1, 2009 to reduce overfishing of gag, followed by permanent rules under Amendment 30B (GMFMC 2008b). Amendment 32 (GMFMC 2011b) subsequently established a formal rebuilding plan for gag not to exceed 10 years.

A benchmark assessment for gag completed in 2014 (SEDAR 33 2014a) indicated that the gag stock was no longer overfished or undergoing overfishing, and had rebuilt to above its maximum sustainable yield level. However, in 2014 a major red tide event occurred off of the Florida west coast in the region of greatest gag abundance. Due to uncertainty about the impact of this red tide event on the gag stock, the Scientific and Statistical Committee (SSC) recommended a acceptable biological catch (ABC) that assumed the 2014 red tide event would have the same impact on the gag stock as the 2005 event. The Council requested that the SSC reevaluate its ABC recommendation, and in January 2015 the SSC received an analysis of the red tide event from the Florida Fish and Wildlife Research Institute which indicated that the impact of the 2014 red tide event was only 4% to 7% of the 2005 event. With this new information, the SSC revised its recommended ABCs based on a projection scenario that assumed no significant impact from the 2014 red tide event.

A benchmark assessment for black grouper was conducted by the Florida Fish and Wildlife Research Institute in 2010 (SEDAR 19 2010). Based on genetic studies, black grouper are considered a single stock in southeast U.S. waters. Spawning season is February through April. The assessment was conducted using ASAP2, an age-structured assessment program, although a surplus production model (ASPIC) was also run for comparison. Both males and females were included in the spawning stock biomass estimates, and a proxy for F_{MSY} was used ($F_{30\% SPR}$) as specified in the 1999 Generic Sustainable Fisheries Act Amendment (GMFMC 1999b). The assessment found that 50% of black grouper females are mature at 6.5 years old and 33.7 inches total length (TL). The length at which 50% transition from female to male occurs is 47.7 inches TL, and the age at which 50% of the specimens were male was 16.0 years. Results of the base model run found that the stock was neither overfished nor undergoing overfishing. The fishing mortality in 2008 was at half the overfishing limit ($F_{2008}/F_{30\% SPR} = 0.50$), and the spawning stock biomass level was 40% above the maximum sustainable yield level ($SSB_{2008}/SSB_{F30\% SPR} = 1.40$). Nearly all of the sensitivity runs also found the stock to be neither overfished nor undergoing overfishing.

Currently, the gag and black grouper recreational and commercial fishing regulations differ between the Gulf and South Atlantic Council waters and state and adjacent federal waters. These

regulations include size limits and closed seasons. This makes it difficult for fishermen to abide by different regulations in the south Florida area, particularly the Florida Keys, where anglers can fish in multiple jurisdictions on a single trip (Figure 1.1.1).

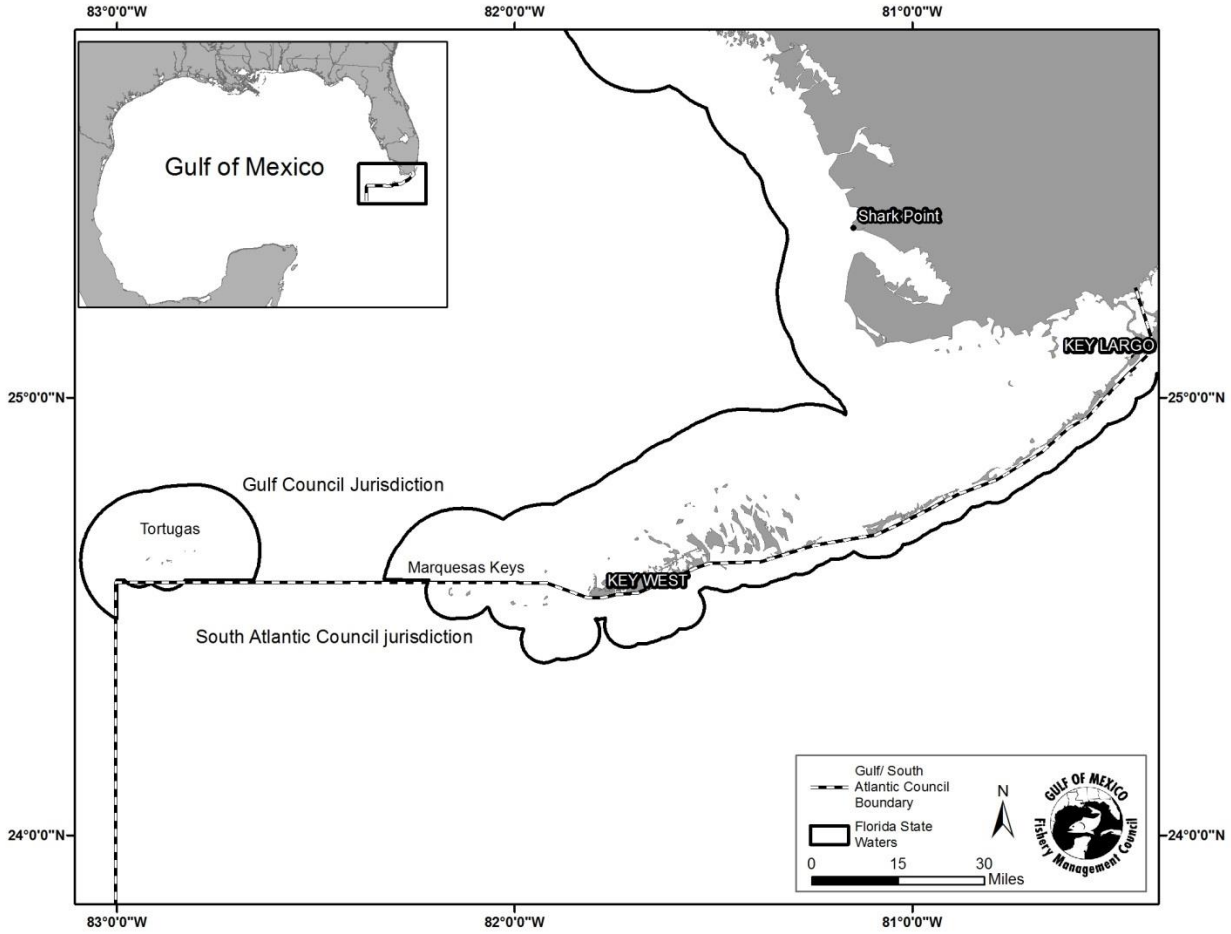

Figure 1.1.1. Inter-Council jurisdiction boundary between the Gulf of Mexico and South Atlantic Councils. A full description of the inter-Council boundary can be found: 61 FR 32540, June 24, 1996, as amended at 63 FR 7075, February 12, 1998 or (CFR 600.105).

Another issue deals with the reporting of black grouper and gag recreational landings in Monroe County, Florida (Tables 1.1.1 and 1.1.2). Monroe County falls in the middle of two regions with Gulf of Mexico to the west and the South Atlantic to the east. Monroe County recreational landings are collected from two different recreational landings surveys: 1) Marine Recreational Information Program (MRIP) for private, charter, and shore trips and 2) Southeast Region Headboat Survey for headboat trips. MRIP landings in Monroe County are not able to be distinguished between Gulf of Mexico and South Atlantic regions. The assessments for black grouper and gag assumed that the majority of the Monroe County MRIP landings come from the South Atlantic region. Therefore, all of the MRIP landings from Monroe County are counted towards the South Atlantic annual catch limit (ACL). The Headboat Survey collects more specific fishing location information, and allows the headboat landings to be separated between the Gulf of Mexico and South Atlantic regions. Therefore, for both species the headboat

landings in the Gulf of Mexico region of Monroe County are counted within the Gulf of Mexico ACL, and the headboat landings in the South Atlantic region of Monroe County are counted within the South Atlantic ACL. However, the majority (99%) of the headboat landings in Monroe County for both black grouper and gag occur in the South Atlantic region.

Table 1.1.1. Gag recreational landings by region, 2010-2014 in lbs gw.

Gag Recreational Landings by Region					
	Monroe County MRIP+Headboat SA	**Monroe County Headboat only Gulf**	**West FL**	**FL Panhandle/AL**	**TX/LA/MS**
2010	1,064	<2,500*	1,246,151	433,186	8,598
2011	1,007	<400*	427,043	305,511	23,773
2012	2,449	<400*	552,192	468,609	3,050
2013	1,135	0	1,124,003	398,225	4,896
2014	19,839	0	683,351	222,252	2,237
% by Gulf Region	n/a	<1%	68%	31%	1%

Source: NFMS-SERO. Monroe County MRIP landings are counted as South Atlantic landings, while headboat landings are split between the Gulf and South Atlantic. *Exact Monroe County Gulf headboat landings are not shown for reasons of confidentiality. FL Panhandle is defined as Escambia to Dixie County. West FL is defined as Levy to Collier County.

Table 1.1.2. Black grouper recreational landings by region, 2010-2014 in lbs gw.

Black Grouper Recreational Landings by Region					
	Monroe County MRIP+Headboat S. Atlantic	**Monroe County Headboat only Gulf**	**West FL**	**FL Panhandle/AL**	**TX/LA/MS**
2010	21,264	<200*	27	9	138
2011	17,097	<100*	353	29	127
2012	51,894	<200*	391	24,959	503
2013	31,459	0	2,922	0	311
2014	49,585	0	348	0	397
% by Gulf Region	n/a	1%	13%	81%	5%

Source: NFMS-SERO. Monroe County MRIP landings are counted as South Atlantic landings, while headboat landings are split between the Gulf and South Atlantic. *Exact Monroe County Gulf headboat landings are not shown for reasons of confidentiality. FL Panhandle is defined as Escambia to Dixie County. West FL is defined as Levy to Collier County.

Gulf of Mexico Fishery Management Council

- Responsible for conservation and management of fish stocks.
- Consists of 11 voting members who are appointed by the Secretary of Commerce, 1 voting member representing each of the five Gulf states, and the Regional Administrator for the National Marine Fisheries Service Southeast Region.
- Responsible for developing fishery management plans and recommending regulations to the National Marine Fisheries Service for implementation.

National Marine Fisheries Service

- Responsible for preventing overfishing while achieving optimum yield.
- Approves, disapproves, or partially approves Council recommendations.
- Implements regulations.

1.2 Purpose and Need

The purpose is to address inconsistencies in recreational minimum size limits for gag and black grouper in South Atlantic and Gulf of Mexico waters; to modify the gag recreational fishing season to allow the recreational ACL in the Gulf of Mexico to be landed without being exceeded, and to synchronize the opening of the recreational gag fishing season with the opening of the recreational red snapper season.

The need is to minimize confusion among anglers over inconsistent size regulations for gag and black grouper, to allow the recreational sector to harvest gag and black grouper at a level consistent with achieving optimum yield while preventing overfishing, to address social and economic impacts of keeping the recreational gag fishing season open to achieve optimum yield, and to optimize recreational opportunities to catch multiple target species on the same trip.

1.3 History of Management

Federal management of gag began in November 1984 with the implementation of the Reef Fish Fishery Management Plan and its associated environmental impact statement (EIS). The initial regulations, designed to rebuild declining reef fish stocks, included prohibitions on the use of fish traps, roller trawls, and powerhead-equipped spear guns within an inshore stressed area and directed the National Marine Fisheries Service (NMFS) to develop data reporting requirements in the reef fish fishery.

In July 1985, the Florida Marine Fisheries Commission (now Florida Fish and Wildlife Conservation Commission - FWCC) established a Florida state regulation to set a minimum size limit of 18 inches total length for gag, black grouper, and several other shallow-water grouper

species. In December 1986 FWCC implemented a state recreational bag limit of five grouper per person per day, with an off-the-water possession limit of 10 per person, for any combination of groupers excluding rock hind and red hind.

Amendment 1 (EA/RIR/IRFA), implemented February 21, 1990, established several reef fish management measures including a 20-inch total length (TL) minimum size limit on red grouper, Nassau grouper, yellowfin grouper, black grouper, and gag. Florida modified its regulations in 1990 to be consistent with the federal regulations.

An August 1999 regulatory amendment, implemented June 19, 2000, increased the commercial size limit for gag and black grouper from 20 to 24 inches TL, increased the recreational size limit for gag from 20 to 22 inches TL, prohibited commercial sale of gag, black, and red grouper each year from February 15 to March 15 (during the peak of gag spawning season), and established two marine reserves (Steamboat Lumps and Madison-Swanson) that are closed year-round to fishing for all species under the Council's jurisdiction. An additional action to further increase the recreational minimum size limit for gag and black grouper by one inch per year until it reached 24 inches TL was disapproved by NMFS. [65 FR 31827].

On August 11, 2009, the Council was notified by NMFS that the Gulf of Mexico gag stock was both overfished and undergoing overfishing based on the results of a 2009 update stock assessment. The remaining summary focuses on the history of gag management since the stock was declared overfished. For a full history of grouper management, refer to Amendment 30B, History of Management Activities Affecting Grouper Harvest (GMFMC 2008b).

Regulatory Actions Since Gag Stock Was Declared Overfished

A rule under the Endangered Species Act was implemented October 16, 2009 that prohibits bottom longlining for Gulf reef fish east of 85°30'W longitude (near Cape San Blas, Florida) shoreward of the 35-fathom depth contour, and it restricts the number of hooks on board to 1,000 hooks per vessel with no more than 750 hooks being fished or rigged for fishing at any given time. The rule replaced the 50 fathom boundary emergency rule in order to relieve social and economic hardship on longline fishermen who were prevented from fishing for shallow-water grouper by the emergency rule, and to keep fishing restrictions consistent with the Amendment 31 actions in place while proposed Amendment 31 is reviewed. [74 FR 53889].

Amendment 29 (EA/RIR/IRFA), implemented January 1, 2010, established an IFQ system for the commercial grouper and tilefish fisheries.

In response to an uncontrolled oil spill resulting from the explosion on April 20, 2010 and subsequent sinking of the Deepwater Horizon oil rig approximately 36 nautical miles (41 statute miles) off the Louisiana coast, NMFS issued an emergency rule to temporarily close a portion of the Gulf of Mexico exclusive economic zone (EEZ) to all fishing [75 FR 24822]. The initial closed area extended from approximately the mouth of the Mississippi River to south of Pensacola, Florida and covered an area of 6,817 square statute miles. The coordinates of the closed area were subsequently modified periodically in response to changes in the size and location of the area affected by the spill. At its largest size on June 1, 2010, the closed area

covered 88,522 square statute miles, or approximately 37 percent of the Gulf of Mexico EEZ. This closure was implemented for public safety.

Amendment 30B (FEIS/RIR/IRFA), implemented May 2009, established annual catch limits (ACLs) and accountability measures (AMs) for gag and red grouper, and managed shallow-water grouper to achieve optimum yield and improve the effectiveness of federal management measures. The amendment (1) defined the gag minimum stock size threshold (MSST) and optimum yield (OY); (2) set interim allocations of gag and red grouper between recreational and commercial fisheries; (3) made adjustments to the gag and red grouper total allowable catches (TACs) to reflect the current status of these stocks; (4) established ACLs and AMs for the commercial and recreational red grouper fisheries, commercial and recreational gag fisheries, and commercial aggregate shallow-water grouper fishery; (5) adjusted recreational grouper bag limits and seasons; (6) adjusted commercial grouper quotas; (7) reduced the red grouper commercial minimum size limit; (8) replaced the one month February 15 through March 14 commercial grouper closed season with a four month seasonal area closure at the Edges, a 390 square nautical mile area in the dominant gag spawning grounds; (9) eliminated the end date for the Madison-Swanson and Steamboat Lumps marine reserves; and (10) required that vessels with federal commercial or charter reef fish permits comply with the more restrictive of state or federal reef fish regulations when fishing in state waters.

Amendment 31 (FEIS/RIR/IRFA), implemented May 26, 2010, (1) prohibited the use of bottom longline gear shoreward of a line approximating the 35-fathom contour from June through August; (2) established a longline endorsement; and (3) restricted the total number of hooks that may be possessed onboard each reef fish bottom longline vessel to 1,000, only 750 of which may be rigged for fishing. The boundary line was initially moved from 20 to 50 fathoms by emergency rule effective May 18, 2009 to protect endangered sea turtles. That rule was replaced on October 16, 2009 by a rule under the Endangered Species Act moving the boundary to 35 fathoms and implementing the maximum hook provisions.

While management measures for the gag rebuilding plan were being developed (**Amendment 32**), an interim rule was published on December 1, 2010 [75 FR 74654], to reduce gag landings consistent with ending overfishing. This interim rule implemented conservative management measures while a rerun of the update stock assessment was being completed. At issue was the treatment of dead discarded fish in the assessment. The rule reduced the commercial quota to 100,000 pounds gutted weight (gw), suspended the use of red grouper multi-use individual fishing quota allocation so it would not be used to harvest gag, and to temporarily halted the recreational harvest of gag until recreational fishing management measures being developed in Amendment 32 could be implemented to allow harvest at the appropriate levels.

The gag 2009 update stock assessment was rerun in December 2010 addressing the problems with discards identified earlier in 2010. This assessment was reviewed in January 2011 by the Council's Scientific and Statistical Committee and presented to the Council at their February 2011 meeting. The assessment indicated that the gag commercial quota implemented in the December 1, 2010, interim rule could be increased and that a longer recreational season could be implemented. In response, the Council requested an interim rule while they continued to work on long-term measures including a gag rebuilding plan in Amendment 32. The interim rule set

the commercial gag quota at 430,000 pounds gw (including the 100,000 pounds previously allowed) for the 2011 fishing year, and temporarily suspended the use of red grouper multi-use individual fishing quota (IFQ) allocation so it cannot be used to harvest gag. It also set a two-month recreational gag fishing season from September 16 through November 15. This temporary rule was effective from June 1, 2011 through November 27, 2011, and was extended for another 186 days or until Amendment 32 was implemented [76 FR 31874].

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Amendment 32 (EIS/RIR/RFA), implemented March 12, 2012, established a rebuilding plan for gag that would rebuild the stock in 10 years or less. The stock-ACL was set at the yield corresponding to the annual estimate of maximum sustainable yield, and the stock-annual catch target (ACT) was set at the yield corresponding to optimum yield. The stock ACL and ACT were then allocated to the recreational and commercial sectors at 61% and 39%. The initial reduction in gag catch levels resulted in a large decrease in the commercial quota, from 1.410 million pounds gutted weight (mp gw) to 0.430 mp gw (Table 1.3.1). This created a concern that, once the grouper IFQ system was implemented in 2012, there would be insufficient shares to accommodate the commercial take of gag, forcing an increase in regulatory discards and additional discard mortality. This additional discard mortality had not been taken into consideration in the stock assessment. Therefore, the commercial gag ACT was reduced by an additional 14% to account for dead discards as a result of insufficient gag IFQ shares that had not been accounted for in the assessment. This adjusted ACT became the commercial gag quota. In addition, the amendment revised the use of multi-use IFQ shares and reduced the commercial gag minimum size limit to 22 inches total length (TL), also to reduce discards. The amendment

set the recreational gag season as July 1 through October 31, with a 22-inch TL minimum size limit and a 2-fish bag limit within the 4-fish aggregate grouper bag limit. The amendment also implemented overage adjustments for the gag recreational sector while the stock was under a rebuilding plan.

Table 1.3.1. Gag ACL, ACT and actual landings in mp gw for 2009-2014.

	Commercial			Recreational		
Year	**Comm. ACL**	**Comm. ACT/Quota**	**Actual landings**	**Rec. ACL**	**Rec. ACT**	**Actual landings**
2009	na	1.320	0.715	2.590	2.060	1.543
2010	na	1.410	0.497	2.640	2.140	1.664
2011	0.616	0.430	0.319	0.964	0.781	0.660
2012	0.788	0.567	0.523	1.232	1.031	0.939
2013	0.956	0.708	0.575	1.495	1.287	1.435
2014	1.110	0.835	0.586	1.720	1.519	0.821

Source: NMFS SERO, Amendment 32 (2011b), and SEDAR 33 (2014a). Prior to 2011 there was not a commercial ACL.

A December 2012 framework action (GMFMC 2012a), implemented July 5, 2013, revised the recreational gag open season. It would still open on July 1, but instead of closing on October 31 it would close on the date when the ACT is projected to be reached. This framework action also modified the February 1 through March 31 recreational closed season on shallow-water grouper to apply only in waters beyond the 20-fathom boundary. In waters shoreward of 20 fathoms, recreational shallow-water grouper fishing would remain open except for gag, which is subject to a separate closed season. This modified closed season took effect at the beginning of 2014.

Amendment 38 (EA/RIR/RFA) was implemented March 1, 2013. It revised the post-season recreational accountability measure that reduces the length of the recreational season for all shallow-water grouper in the year following a year in which the ACL for gag or red grouper is exceeded. The modified accountability measure reduces the recreational season of only the species for which the ACL was exceeded.

An April 2013 framework action (GMFMC 2013), implemented September 3, 2013, removed the requirement to have venting tools onboard and to use them when releasing reef fish.

1.4 Gag ACL and ACT

Amendment 32 established a rebuilding plan for gag, including yield streams for increasing ACLs and ACTs for 2012 through 2015. For 2015, the rebuilding plan set a stock ACL of 3.12 mp gw. This was an increase of 300,000 lbs, or 10.6%, above the 2014 ACL. The resulting sector ACLs and ACTs for 2015 are shown in Table 1.4.1.

Table 1.4.1. Gag acceptable biological catch (ABC), ACL, and annual catch target (ACT) for 2015 from the gag rebuilding plan (Amendment 32).

		Recreational		Commercial	
Year	ABC/Stock ACL	ACL	ACT	ACL	ACT/Quota
2015+	3.12	1.903	1.708	1.217	0.939

Source: Amendment 32 (GMFMC 2011b). Units are in million pounds gutted weight. The stock ACL is allocated 61% recreational, 39% commercial.

The 2014 benchmark assessment (SEDAR 33, 2014a) indicated that the gag stock was no longer overfished or experiencing overfishing as of 2012. However, as discussed in Section 1.1, in 2014 a major red tide event occurred off of the Florida west coast in the region of greatest gag abundance. After reviewing an analysis of the red tide event from the Florida Fish and Wildlife Research Institute, the SSC concluded that it would have no significant impact on the gag stock, and recommended an overfishing limit (OFL) and acceptable biological catch (ABC) for 2015-2017 based on the rebuilt stock status. The resulting yields from the ABC control rule produced ABC projections that were very close to the OFL yields. The SSC felt that this buffer was too small to provide protection against overfishing (exceeding OFL). Therefore, the SSC decided to recommend a yield stream based on the optimum yield (OY) yields (Table 1.4.2).

Table 1.4.2. OFL, ABC, and OY projections for gag based on SEDAR 33 benchmark assessment and assuming no red tide mortality in 2014.

Year	OFL	ABC from control rule	OY (ABC recommended by SSC
2015	6.77	6.43	5.21
2016	5.84	5.57	4.75
2017	5.38	5.13	4.57
Equilibrium	4.45	4.21	4.46

Units are in million pounds gutted weight.

Upon review of the SEDAR 33 assessment and ABC recommendations, both recreational and commercial members of the Reef Fish Advisory Panel (Reef Fish AP) pointed out they have not observed the rapid recovery of the gag stock that the stock assessment has indicated. The Reef Fish AP therefore recommended that the Council set a precautionary gag ACL (GMFMC 2014).

The SSC subsequently reviewed several catch-per-unit-effort (CPUE) indices for gag updated through 2014. The updated indices indicated that recreational landings per angler hour have been declining since 2010 for headboats, and since 2008 for charter boats and private vessels. Fishery-independent indices have also shown declining values in recent years. In addition, an index of recruitment success for northeastern Gulf of Mexico gag grouper by year based on a model that uses oceanographic conditions to project larval transport model runs projects below average recruitment since 2010 (Figure 1.4.1) (GMFMC 2015).

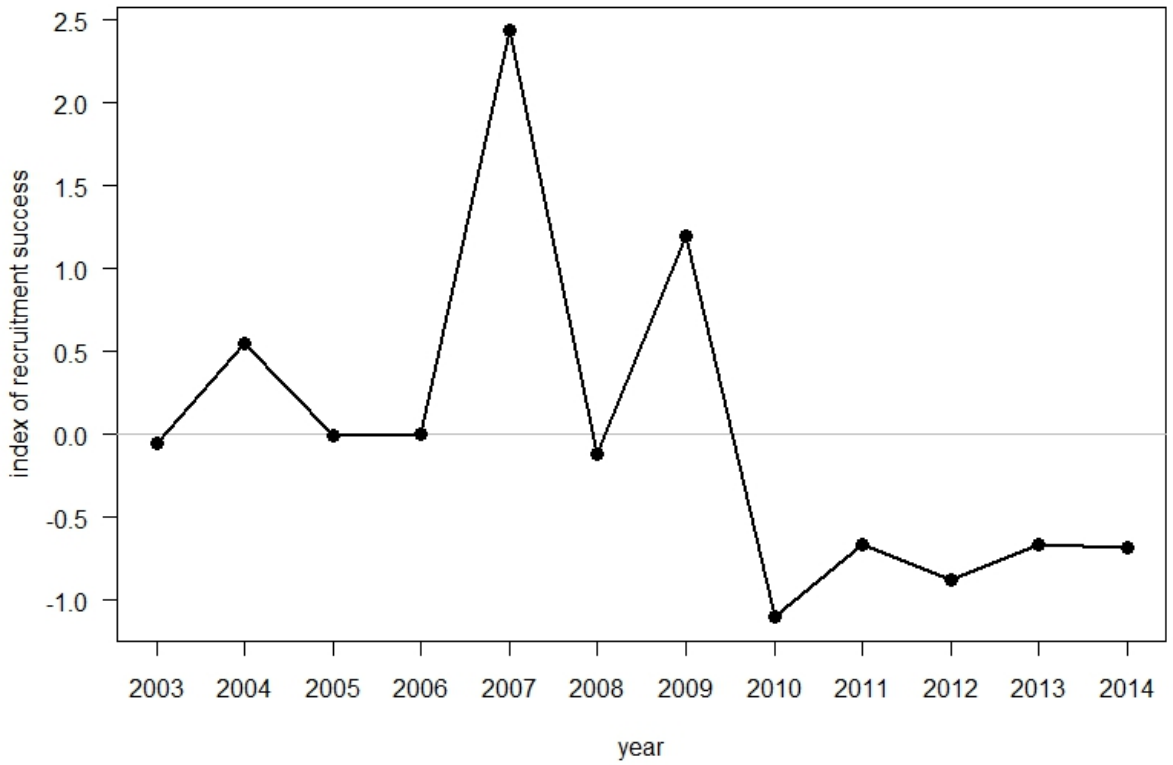

Figure 1.4.1. Expected recruitment anomalies for northeastern Gulf of Mexico gag grouper by year based solely on the effects of oceanographic conditions (update from SEDAR33-DW18).

As a result of the updated analysis, the SSC recommended that, given the recent declines in fishery-dependent and fishery-independent indices of abundance for gag, that the Council use caution when setting the ACL and ACT for 2015-2017.

Based on the recommendations of the Reef Fish AP and the SSC, plus public testimony presented at the June 2015 Council meeting, the Council voted not to change the gag ACL or ACT at this time. The status quo ACLs and ACTs shown in Table 1.4.1 will remain in effect, and all alternatives to change them have been moved to the considered but rejected section of this framework action.

A SEDAR gag update assessment is tentatively scheduled to be conducted in 2016, with results presented to the Council in March 2017.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 – Gag Recreational Minimum Size Limit

Alternative 1. (No Action) The recreational minimum size limit for gag remains at 22 inches total length (TL).

Preferred Alternative 2. Set the recreational minimum size limit for gag at 24 inches TL.

Discussion:
This action evaluates whether the gag recreational minimum size limit in the Gulf, currently 22 inches TL, should be made consistent with the minimum size limit in the South Atlantic, which is 24 inches TL. Thus, the range of alternatives is based on retaining inconsistent size limits (**Alternative 1**) or adopting a minimum size limit to be consistent with the South Atlantic's minimum size limit (**Preferred Alternative 2**). Therefore, only the Preferred Alternative is considered reasonable to address the purpose and need.

These alternatives also encompass the range of estimated sizes at 50% female gag maturity. The SEDAR 33 assessment estimated the size at 50% maturity to be 22 inches TL, but earlier assessments estimated the size at 24 inches TL.

The SEFSC provided Yield-per-recruit (YPR) and Spawning Potential Ratio (SPR) analysis results from the SEDAR 33 assessment model for both the 22 and 24 inches TL size limits (Table 1.4.3). This analysis assumes equilibrium conditions and recruitment is constant, and was run for the current stock conditions (e.g. recent estimate of fishing mortality rate). The analysis incorporated discard mortality of released gag and focused only on the recreational sector. The results showed that increasing the size limit from 22 to 24 inches TL will give a very slight reduction in YPR, however, this results in a substantial increase in SPR. Therefore, raising the size limit has the potential to slighty reduce landings but will likely positively impact the stock by increasing abundance of the spawning stock.

Table 1.4.3. Yield-per-recruit (YPR) and Spawning Potential Ratio (SPR) analysis results from the SEDAR 33 assessment model for the two size limits of 22 and 24 inches TL.

Size Limit (inches TL)	YPR	SPR
22	0.405	0.782
24	0.383	1.547

An additional issue to consider is the misidentification of gag and black grouper by recreational fishermen. Black grouper and gag are similar looking, and gag are often called black grouper in the northern Gulf. This can result in confusion if gag and black grouper have different regulations. For this reason, Action 1 (gag minimum size limit) and Action 2 (black grouper minimum size limit) have the same range of alternatives. On a percentage basis, Monroe County

landings of gag account for less than 1% of the Gulf gag landings (Table 1.1.1), but 85% of the black grouper landings (Table 1.1.2).

Alternative 1 (No Action) leaves the gag recreational minimum size limit at 22 inches TL. This is inconsistent with the South Atlantic minimum size limit which was set to 24 inches TL for both the recreational and commercial sector in 1999 (SAFMC 1999). The 22-inch TL recreational minimum size limit was implemented in the Gulf of Mexico (Gulf) for gag and black grouper in 2000 (GMFMC 1999a). At that time the commercial minimum size limit for gag and black grouper was set at 24 inches TL which was estimated to be the size at which 50% of female gag reach reproductive maturity (Schirripa and Goodyear 1994). The Council proposed a further increase in the recreational minimum size limit by one inch per year until it reached 24 inches TL. However, that proposal was disapproved by NMFS on the basis that setting both the commercial and recreational minimum size limits at 24 inches TL would disproportionately impact the recreational sector, which catches smaller fish on average than the commercial sector. In 2012, Amendment 32 reduced the commercial minimum size limit for gag to 22 inches TL to reduce discard mortality. More recent analysis has estimated the size at which 50% of the female gag reach reproductive maturity to be 22 inches TL (SEDAR 33 2014a). Therefore, **Alternative 1** would keep the gag size limit at the size of 50% of the females reaching reproductive maturity, but it would be inconsistent with the South Atlantic's 24-inch TL minimum size limit. For recreational fishermen in the south Florida area who fish in both Gulf and South Atlantic Council jurisdictions, this can create confusion as to which size limit should be followed. In addition, while the state of Florida has a 22-inch TL size limit in state waters of the Gulf and a 24-inch TL size limit in the South Atlantic, the state's 24-inch TL size limit applies to state waters off Monroe County in both the Atlantic and Gulf.

Preferred Alternative 2 sets the gag recreational minimum size limit at 24 inches TL, which is consistent with South Atlantic's and State of Florida's Monroe County minimum size limit. However, it is inconsistent with the minimum size limit for the State of Florida north of Monroe County, plus Alabama, Mississippi, Louisiana, and Texas, which all have a 22-inch TL recreational minimum size limit in their state waters (unless the states also adopt size limit changes). As noted above, the Council's proposal in 2000 to increase the gag minimum size limit to 24 inches TL for both the commercial and recreational sectors was disapproved by NMFS on the basis that it would disproportionately impact the recreational sector, which catches smaller fish on average than the commercial sector. The issue of disproportionality is not relevant in this current situation. This is exclusively a recreational action and comparisons reflect recreational sector benefits under the status quo to those of the new management regime. In addition, in 2000, the recreational gag season was open year-round. Today, there is a potential for an early closure if the recreational ACL is projected to be reached before the scheduled season end. Early closures are disruptive to the recreational sector, particularly for charter vessels which may have trips reserved months in advance. An increase in the size limit would reduce the rate of retained yield and help to extend the recreational fishing season. Gag reach 22 inches TL at about 3.5 years and are estimated to take about half a year to grow to 24 inches TL (Table 2.1.1).

Table 2.1.1. Gag size (inches TL) at age (years) based on growth function in SEDAR 33.

Age	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Inches	10	16	20	24	28	31	33	36	38	39	41	42	44	45	45	46	47	48	48	49

Increasing the minimum size limit will reduce the retained catch rate and extend the season (Tables 2.3.1 and 2.3.2), but will also increase regulatory discards and discard mortality. Discard mortality rates vary with depth. The 2006 gag stock assessment (SEDAR 10 2006) calculated the overall discard mortality for gag from all sources of recreational fishing at 21%. However, analysis conducted for the current SEDAR 33 (2014a) assessment calculated a lower rate of mortality, 16% from headboats and charter vessels, and 12% from private recreational vessels (Table 2.1.2) (Sauls 2013).

Table 2.1.2. Calculated average depth of released gag by fishing fleet and associated discard mortality rate estimate.

Fishing Fleet	Avg. depth (m)	Sauls (2013) % Mortality	SEDAR 10 (2006) % Mortality
Vertical line	31	0.27	0.57
Longline	58	0.27	0.76
Headboat	27	0.16	0.21
Charter vessel	25	0.16	0.21
Private recreational	17	0.12	0.21

From SEDAR 33 (2014a), Table 5.2. Original source: Sauls 2013.

Based on the von von Bertalanffy growth equation used in SEDAR 33[1], it takes approximately 7 months for a gag to grow from 22 inches TL to 24 inches TL. Given the speed at which gag grow from 22 inches TL to 24 inches TL, and a relatively low release mortality rate in shallow water, any increase in dead discards from increasing the size limit is expected to be minor.

[1] $l_t = L_\infty * (1 - e^{-k(t-t0)})$ where L_∞ (mm TL) = 1277.95, k = 0.1342, and t_0 = -0.6687

2.2 Action 2 – Black Grouper Recreational Minimum Size Limit

Alternative 1. (No Action**)** The recreational minimum size limit for black grouper remains at 22 inches TL.

Preferred Alternative 2. Set the recreational minimum size limit for black grouper at 24 inches TL.

Discussion:

Similar to gag, the primary issue regarding this action is whether the black grouper recreational minimum size limit in the Gulf should be consistent with the size limit in the South Atlantic, which is 24 inches TL. Black grouper and gag are similar looking, and gag are often called black grouper in the northern Gulf. This can result in confusion if gag and black grouper have different size limits. The range of alternatives is to be either consistent or remain inconsistent. Fifty percent of the female black grouper are estimated to be reproductively mature at 6.5 years of age, approximately 34 inches TL (Table 2.2.1). The minimum size limits being considered in this action are both under the size when 50% of the females reach reproductive maturity. However, the SEDAR 19 black grouper stock assessment concluded that the black grouper stock is neither overfished nor undergoing overfishing. The fishing mortality in 2008 was at half the overfishing limit, and the spawning stock biomass level was 40% above the maximum sustainable yield level (SEDAR 19 2010). Therefore, it is unnecessary to reduce landings by increasing the size limit. In addition, black grouper are included as part of the ACL for "other" shallow-water grouper (black, scamp, yellowmouth, and yellowfin grouper). This aggregate ACL has never been reached, and from 2011 to 2013 black grouper contributed to only about 7% of the total recreational shallow water grouper landings (pers. comm. NMFS SERO). Since the issue is consistency of regulations, there are only two reasonable alternatives.

Alternative 1 (No Action) leaves the black grouper recreational minimum size limit at 22 inches TL. This is inconsistent with the South Atlantic minimum size limit which was set to 24 inches TL for both the recreational and commercial sector in 1999 (SAFMC 1999), but is consistent with the commercial minimum size limit of 22 inches TL in the Gulf. As discussed under Action 1, the 22-inch TL recreational minimum size limit was implemented in the Gulf for gag and black grouper in 2000 (GMFMC 1999a). The Council proposed a further increase in the recreational minimum size limit by one inch per year until it reached 24 inches TL. However, that proposal was disapproved by NMFS. For recreational fishermen in the south Florida area who fish in both Gulf and South Atlantic Council jurisdictions, the difference in minimum size limit regulations can create confusion as to which size limit should be adhered to. In addition, for black grouper, while the State of Florida has a 22-inch TL recreational size limit in state waters in the Gulf and a 24-inch TL recreational size limit in the South Atlantic, the 24-inch TL size limit applies to state waters off Monroe County in both the Atlantic and Gulf. Alabama, Mississippi, and Louisiana also have a 22 inch TL recreational minimum size limit for black grouper, while Texas has no black grouper size limit (Table 2.2.2). Black grouper are primarily a south Florida stock, particularly a Monroe County stock (Table 2.1.2). Although landings of black grouper have been reported from the northern and western Gulf (likely from the Flower Gardens and surrounding banks and grails), gag are frequently referred to as black grouper, which can create confusion in properly identifying gag and black grouper.

Preferred Alternative 2 sets the black grouper recreational minimum size limit at 24 inches TL, which is consistent with the South Atlantic's minimum size limit and with the commercial minimum size limit in the Gulf. It is inconsistent with the minimum size limit for the State of Florida north of Monroe County, plus Alabama, Mississippi, and Louisiana, which all have a 22-inch TL recreational minimum size limit in their state waters (unless the states also adopt size limit changes). Texas has no size limit for black grouper (Table 2.2.2). As noted above, the Council's proposal in 2000 to increase the black grouper minimum size limit to 24 inches TL for both the commercial and recreational sectors was disapproved by NMFS on the basis that it would disproportionately impact the recreational sector, which catches smaller fish on average than the commercial sector. However, the benefits of having a size limit that is consistent with both the proposed gag size limit and the South Atlantic and Florida state size limits off Monroe County may outweigh any negative impacts on landings. Furthermore, gag are sometimes landed as black grouper. Having the same size limit for gag and black grouper eliminates any possible confusion over species identification. Black grouper are estimated to reach 22 inches TL at just under 3 years and take about half a year to grow to 24 inches TL (Table 2.2.1). Increasing the minimum size limit will reduce the retained catch rate, but since the season is already open year-round (except for a February – March closure in waters greater than 20 fathoms), there will be no effect on season length.

Table 2.2.1. Black grouper size (inches TL) at age (years) based on growth function (in SEDAR 19)

Age	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Inches	13	18	22	26	30	33	36	38	40	42	43	44	45	46	47	48	48	49	49	50

Increasing the minimum size limit will increase regulatory discards and discard mortality. The SEDAR 19 (2010) black grouper assessment used a base discard mortality rate of 20% for hook and line fishing. However, due to a lack of empirical data, sensitivity runs were performed that varied this estimate from 10 – 90%, and found that varying the discard mortality rate had a high impact on the results. A new black grouper standard assessment is planned for 2015-2016, under which the discard mortality rate estimate will be reevaluated. Despite the uncertainty regarding the discard mortality rate, given the speed at which black grouper grow from 22 inches to 24 inches, any increase in dead discards from increasing the size limit is expected to minor.

Table 2.2.2. Gulf States recreational minimum size limits for gag and black grouper in inches TL

	FL	**AL**	**MS**	**LA**	**TX**
Gag	22"	22"	22"	22"	22"
Black Grouper	22"	22"	22"	22"	none

2.3 Action 3 – Modifications to the Recreational Gag Fishing Season

Alternative 1: (No action) The recreational gag season will remain July 1 through December 2 (155 days) unless shortened due to a projection that the annual catch level (ACL) will be reached sooner.

Preferred Alternative 2: Remove the December 3-31 fixed closed season. The recreational gag season will remain open through the end of the year or until a projection that the ACL will be reached sooner[2]. Note Alternative 3, 4 or 5 may also be selected in combination with this alternative.

Alternative 3: Remove the January through June gag seasonal closure. Begin the season on January 1 and close when the recreational ACL is projected to be reached[1].

> **Option 3a**. Maintain the February 1 through March 31 closed season on recreational harvest of gag seaward of the 20-fathom boundary. Fishing for gag will be allowed shoreward of the boundary during those months.
>
> **Option 3b**. Remove the February 1 through March 31 closed season on recreational harvest of gag seaward of the 20-fathom boundary. Fishing for gag will be allowed in all federal waters during those months. The 20-fathom closure will continue to be in effect for other shallow-water grouper.
>
> **Option 3c**. Close the gag recreational season from February 1 through March 31 in all Federal waters.

Alternative 4: Remove the January through June gag seasonal closure. Set an opening date for the recreational gag season such that the ACL is projected to be reached on or after December 31 (based on the 2016 ACL).

> **Option 4a**. Maintain the February 1 through March 31 closed season on recreational harvest of gag seaward of the 20-fathom boundary. Fishing for gag will be allowed shoreward of the boundary during those months if gag season is open.
>
> **Option 4b**. Remove the February 1 through March 31 closed season on recreational harvest of gag seaward of the 20-fathom boundary. Fishing for gag will be allowed in all federal waters during those months if gag season is open. The 20-fathom closure will continue to be in effect for other shallow-water grouper.
>
> **Option 4c**. Open January 1 through 31, close February 1 through March 31 to recreational harvest of gag in all federal waters, and re-open on the date such that the 2016 ACL is projected to be reached on or after December 31.

[2] The recreational season closing date for gag is normally based on when the date when the ACL is projected to be reached. However, under the accountability measures for gag, if the recreational landings for gag exceed the ACL, then in the following year the season will close based on when the ACT is projected to be reached.

Preferred Alternative 5: Remove the June 1 through 30 portion of the recreational fixed closed season on gag. Begin the open season on June 1, and close when the recreational ACL is projected to be reached[1].

Discussion:
Gag have a protracted spawning season (December to May), but their peak spawning occurs during February-March in depths of 35 to 45 fathoms. There is currently a closed season for all shallow-water grouper from February 1 through March 31 of each year in offshore waters seaward of a series of boundary lines that approximate the 20-fathom depth contour (GMFMC 2012a). During this period, recreational harvest of shallow-water grouper (red, black, gag, yellowfin, yellowmouth, and scamp) is prohibited in depths seaward of 20 fathoms. Shoreward of this boundary, harvest of shallow-water grouper is allowed, except for gag which is under a January 1 through June 30 closed season. If the open season for gag is modified to include days from February or March, that opening will apply only shoreward of the 20-fathom boundary during those days unless modified by options in the above alternatives. In waters seaward of 20 fathoms harvest would continue to be closed to all shallow-water grouper including gag.

Florida has a regional recreational open season for gag during April 1 through June 30 in state waters off Franklin, Wakulla, Taylor, and Jefferson Counties. The analysis of harvest levels and season length assumes that Florida will adopt a season consistent with the federal season. If Florida continues with the regional season, an additional 24,289 lbs gw of gag landings are projected to occur. This prediction is based on an average of the gag recreational harvest in these four counties during April and May for the recent three years of 2013, 2014, and 2015 (personal communication, SERO).

Alternative 1 leaves the recreational gag season at its current dates of July 1 through December 2. Preliminary landings estimates for 2014 indicate that the recreational sector landed 870,720 lbs. of gag, just 48% of the 2014 ACL (1.72 mp), and 43% of the 2015 ACL (1.903 mp). Without changes to increase the number of fishing days in the recreational season, it is unlikely that the recreational sector will be able to catch its allocation.

Preferred Alternative 2 removes the December 3-31 fixed closed season. This alternative removes the December 3 closure date, allowing the season to remain open for any length of time or until the ACL (or ACT if season is under accountability measures) is projected to be reached. This alternative can be selected in combination with either **Alternative 3** or **Alternative 4**.

Alternatives 3 and 4 revise the recreational gag fishing season by modifying either the opening or closing date. Normally, the recreational gag season is closed on the date when the ACL is projected to be reached. However, if the ACL is exceeded, then under the accountability measures for gag, the following season is closed when the ACT is projected to be reached. Tables 2.3.1 and 2.3.2 show estimated season dates for **Alternatives 3** and **4** under both ACL and ACT closures. However, given the low catch rates in recent years, it is probable that the season closure will be governed by the ACL, at least for the first year of implementation.

Alternative 3 sets a gag recreational season that opens on January 1 and closes when the recreational ACL is projected to be reached (unless accountability measures are in effect, in which case the closing date is based on when the ACT is projected to be reached). **Option 3a** leaves the February-March shallow-water grouper closed season beyond the 20-fathom boundary in place for gag and other shallow-water grouper. Gag recreational harvest would be closed seaward of the 20-fathom boundary but would be open shoreward of the boundary during these months. These days are counted as open days when calculating the number of days in the gag fishing season. **Option 3b** eliminates the February-March closed season seaward of the 20-fathom boundary for gag (but not for other shallow-water groupers), so that gag could be caught in all waters during this period. The 20-fathom boundary closure would remain in place for other shallow-water grouper. **Option 3c** closes February-March to harvest of gag in all waters (but not for other shallow-water groupers). The recreational gag season would open in January, close February and March, and then reopen on April 1 and remain open until the ACL is projected to be reached (or ACT if accountability measures are in effect). Table 2.3.1 shows the projected season dates and number of fishing days under each combination of Action 1 size limit alternative and Action 2, **Alternative 3** option.

Alternative 4 sets an opening date for the gag recreational season that is projected to allow the 2016 gag season to remain open (other than fixed closures) through December 31 without exceeding the ACL. **Option 4a** leaves the February-March shallow-water grouper closed season beyond the 20-fathom boundary in place for gag and other shallow-water groupers. Gag recreational harvest would be closed seaward of the 20-fathom boundary but would be open shoreward of the boundary during these months if the gag season is open. These days are counted as open days when calculating the number of days in the gag fishing season. **Option 4b** eliminates the February-March closed season seaward of the 20-fathom boundary for gag (but not for other shallow-water groupers), so that gag could be caught in all waters during this period if the gag season is open. The 20-fathom boundary closure would remain in place for other shallow-water grouper. **Option 4c** closes February-March to harvest of gag in all waters (but not for other shallow-water groupers). The recreational gag season would open in January, close February and March, and then reopen on the date that is projected to allow the 2016 gag season to remain open (other than fixed closures) through December 31 without exceeding the ACL. Table 2.3.2 shows the projected season dates and number of fishing days under each combination of Action 1 alternative and Action 2, **Alternative 4** option.

Under **Alternative 4**, the opening dates would only be calculated once, when first implemented. These opening dates would then remain in effect in future years unless modified in a framework action. Consequently, it is possible that an ACL (or ACT) closure could occur in future years if the ACL or ACT is reduced or if catch rates increase.

Preferred Alternative 5 was recommended by anglers in public testimony during the October 2015 Council meeting where final action was taken. It would move the opening date of the recreational gag season from July 1 to June 1. In combination with **Preferred Alternative 2**, this would allow a season of up to seven months or until the ACL is projected to be reached. This season, combined with a 24-inch minimum size limit from the Action 1 preferred alternative, is projected to provide a June 1 through December 31 open season (214 days). The projected harvest is 1.489 mp gw. This is 22% below the ACL (1.903 mp gw) and 13% below

the ACT (1.708 mp gw). Although neither the ACL nor the ACT harvest levels are projected to be reached, the Council felt that a conservative season was warranted, given anecdotal information of lower abundance in recent years, recruitment indices that have been below average since 2010 (Figure 1.4.1), and a recommendation from the Reef Fish AP that the Council use a precautionary approach (GMFMC 2014). If the status quo 22-inch minimum size limit were to be maintained, the projected harvest would be 1.903 mp gw. This is just 2% below the ACL and 9% above the ACT, increasing the risk that the ACL would be exceeded.

These season projections in the following tables are based on estimates for 2016 only and are subject to revision. The projection model does not account for effort shifting that may take place during a seasonal closure, nor does it consider any changes in the average size of gag over time. Additionally, reductions in harvest from closure dates are relative to future projected landings. Actual future landings may be higher or lower than projected, resulting in harvest reductions being over or underestimated.

Table 2.3.1. Estimated gag recreational seasons under combinations of Action 1 size limits and Action 3, Alternative 3 options.

		Action 3 Alternative 3 Option		
Minimum Size Limit		**Alt. 3a 20-fathom closure in effect**	**Alt. 3b No 20-fathom closure**	**Alt. 3c Feb-Mar closed in all waters**
22 inches TL	ACL	1/1-8/27 (239 days)	1/1-8/23 (235 days)	1/1-1/31 : 4/1-10/6 (220 days)
	ACT	*1/1-8/15 (227 days)*	*1/1-8/10 (222 days)*	*1/1-1/31 : 4/1-8/28 (181 days)*
24 inches TL	ACL	1/1-12/9 (343 days)	1/1-11/30 (334 days)	1/1-1/31 :4/1-12/31 (306 days)
	ACT	*1/1-11/2 (306 days)*	*1/1-10/21 (294 days)*	*1/1-1/31 : 4/1-11/30 (275 days)*

Season closes at 12:01 am on the day following the last date of the season. The upper numbers are the estimated season dates and days to reach the ACL. The lower numbers (in italics) are the estimated season dates and days to reach the ACT. Seasons will be based on the ACL dates unless the ACL was exceeded in the previous year, in which case season dates will be based on the ACT.

Table 2.3.2. Estimated gag recreational seasons under combinations of Action 1 size limits and Action 3, Alternative 4 options.

		Action 3 Alternative 4 Options		
Minimum Size Limit		**Alt. 4a 20-fathom closure in effect**	**Alt. 4b No 20-fathom closure**	**Alt. 4c Feb-Mar closed in all waters**
22 inches TL	ACL	5/28-12/31 (218 days)	5/28-12/31 (218 days)	5/28-12/31 (218 days)
	ACT	*6/21-12/31 (194 days)*	*6/21-12/31 (194 days)*	*6/21-12/31 (194 days)*
24 inches TL	ACL	2/6-12/31 (329 days)	2/19-12/31 (316 days)	1/1-1/31 :4/1-12/31 (306 days)
	ACT	*4/18-12/31 (258 days)*	*4/18-12/31 (258 days)*	*4/18-12/31 (258 days)*

Season closes at 12:01 am on the day following the last date of the season. The upper numbers are the estimated season dates and days to reach the ACL. The lower numbers (in italics) are the estimated season dates and days to reach the ACT. Seasons will be based on the ACL dates unless the ACL was exceeded in the previous year, in which case season dates will be based on the ACT.

CHAPTER 3. AFFECTED ENVIRONMENT

The actions considered in this amendment and associated environmental assessment (EA) would affect fishing in the Gulf of Mexico (Gulf), both in state and federal waters (Figure 3.1). Descriptions of the physical, biological, economic, social, and administrative environments are available in the Reef Fish Amendment 32 (GMFMC 2011b) and associated environmental impact statement (EIS). Information from this EIS is being incorporated herein by reference and the reader is directed to the document to obtain the information which is located at http://www.gulfcouncil.org/fishery_management_plans/index.php.

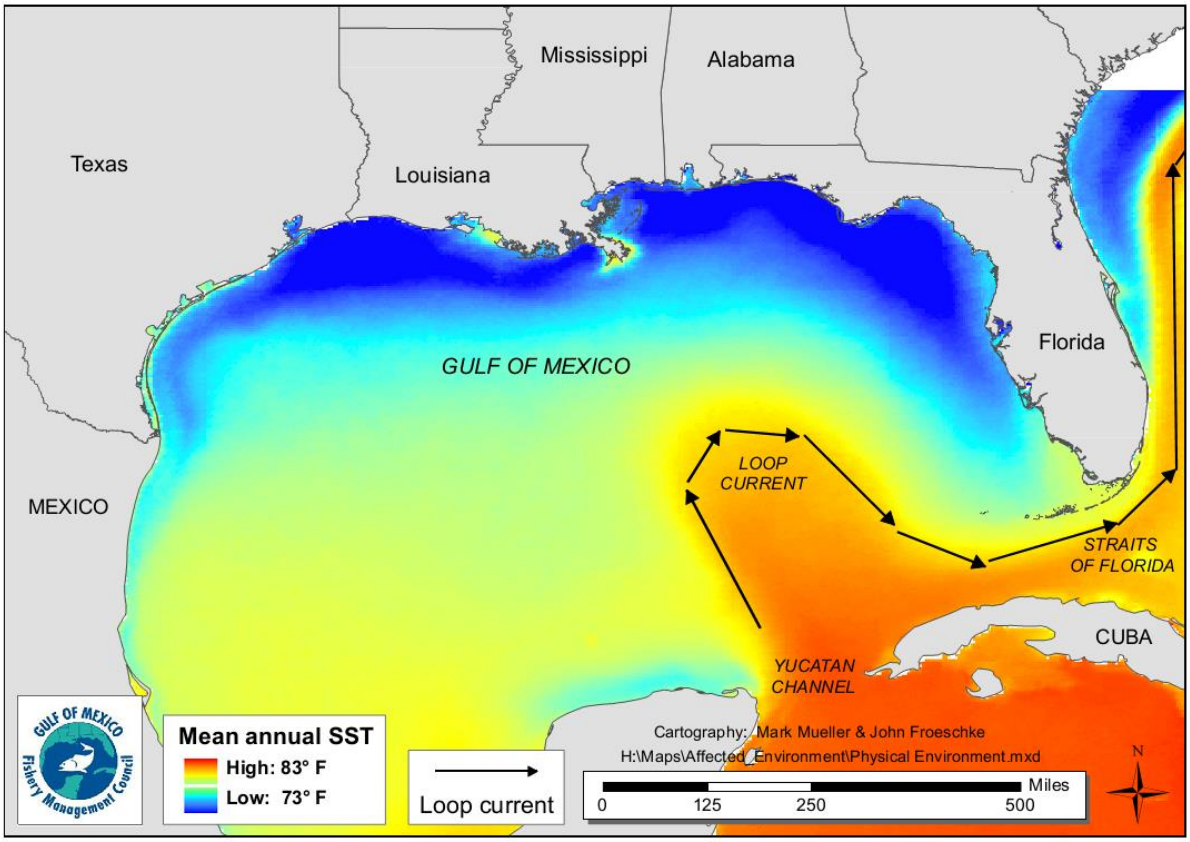

Figure 3.1. Physical environment of the Gulf including major feature names and mean annual sea surface temperature as derived from the Advanced Very High Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (http://accession.nodc.noaa.gov/0072888)

3.1 Description of the Physical Environment

The Gulf has a total area of approximately 600,000 square miles (1.5 million km^2), including state waters (Gore 1992). It is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel (Figure 3.1). Oceanographic conditions are affected by the Loop Current, discharge of freshwater into the northern Gulf, and a semi-permanent, anti-cyclonic gyre in the western Gulf. The Gulf includes both temperate and tropical waters (McEachran and Fechhelm 2005). Mean annual sea surface temperatures ranged from 73 through 83º F (23-28º C) including bays and bayous (Figure 3.1) between 1982 and 2009, according to satellite-derived measurements (NODC 2012: http://accession.nodc.noaa.gov/0072888). In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

The physical environment for gag and black grouper has been described in detail in the EIS for the Generic Essential Fish Habitat (EFH) Amendment (Generic EFH Amendment) (GMFMC 2004a), and the Generic Annual Catch Limit (ACL)/Accountability Measure (AM) Amendment (Generic ACL/AM Amendment)(GMFMC 2011a) which are hereby incorporated by reference.

The management unit for Gulf gag extends from the United States–Mexico border in the west through the northern Gulf waters and west of the Dry Tortugas and the Florida Keys. Currently, the Council manages Gag as one unit. Black grouper has been assessed as a single stock throughout the Gulf and South Atlantic. The ABC is apportioned 47% to the South Atlantic and 53% to the Gulf, and the apportionments are managed as separate South Atlantic and Gulf of Mexico units with the boundary essentially being U.S. Highway 1 in the Florida Keys west to the Dry Tortugas.

Gag range from the New York to Brazil and in the Gulf (Smith 1971; Huntsman 1976; Hardy 1978; Collins et al. 1987). Gag are protogynous and make annual late-winter migrations to specific locations to form spawning aggregations (Collins et al., 1987; Keener et al., 1988; Van Sant et al., 1994).

Gag eggs and larvae are pelagic with juveniles settling out to coastal seagrass beds. Adult gag are associated with bottom topographies on the continental shelf which have high relief, i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings (GMFMC 2004a). The vast majority of gag are caught on the west coast of Florida from northern Pinellas County to the northern extent of the state (Schirripa and Goodyear 1994).

Black grouper in the southeastern United States (the northern most part of their range) are found chiefly in southern Florida and the Florida Keys, although specimens have been recorded from Massachusetts to Texas. The range of black grouper extends south to Brazil and east to Bermuda.

Black grouper eggs and larvae settle to the bottom, and juvenile black grouper have found near shallow rocky reef habitats which had either high vertical relief with crevices, caves, or small dispersed rocks (Brulé et al. 2005).They are often found associated with rocky ledges and coral reefs from 10-100 meters (m). Black grouper are caught more commonly in the Florida Keys

along the reef tract, and are caught along high relief areas in deeper waters off of the west coast of Florida to the Florida Middle Grounds and off of the east coast of Florida. Generally, larger and older individuals are caught more often in deeper waters (SEDAR 19 2010).

Habitat Areas of Particular Concern (HAPC)

Generic EFH Amendment 3 (GMFMC 2005) for addressing EFH, habitat areas of particular concern (HAPC), and adverse effects of fishing in the following fishery management plans of the Gulf Reef Fish Resources, Red Drum, and Coastal Migratory Pelagics is hereby incorporated by reference. Amendment 32 (GMFMC 2011b) also describes environmental sites of special interest relevant to the reef fish fishery including gear restricted areas, area closures, and HAPCs.

Environmental Sites of Special Interest Relevant to Reef Fish, Red Drum, Coastal Migratory Pelagics, Spiny Lobster, Red Drum, and Coral and Coral Reefs (Figure 3.1.1)

Longline/Buoy Gear Area Closure – Permanent closure to use of these gears for reef fish harvest inshore of 20 fathoms (36.6 meters) off the Florida shelf and inshore of 50 fathoms (91.4 meters) for the remainder of the Gulf, and encompasses 72,300 square nautical miles (nm^2) or 133,344 km^2 (GMFMC 1989). Bottom longline gear is prohibited inshore of 35 fathoms (54.3 meters) during the months of June through August in the eastern Gulf (GMFMC 2009).

Madison-Swanson and Steamboat Lumps Marine Reserves - No-take marine reserves (total area is 219 nm^2 or 405 square kilometers ($km^{2)}$) sited based on gag spawning aggregation areas where all fishing is prohibited except surface trolling from May through October (GMFMC 1999a; 2003a).

The Edges Marine Reserve – All fishing is prohibited in this area (390 nm^2 or 1,338 km^2) from January through April and possession of any fish species is prohibited, except for such possession aboard a vessel in transit with fishing gear stowed as specified. The provisions of this do not apply to highly migratory species (GMFMC 2008b).

Tortugas North and South Marine Reserves – No-take marine reserves (185 nm^2) cooperatively implemented by the state of Florida, National Ocean Service, the Gulf of Mexico Fishery Management Council (Council), and the National Park Service in Generic Amendment 2 Establishing the Tortugas Marine Reserves (GMFMC 2001).

Reef and bank areas designated HAPCs in the northwestern Gulf include – East and West Flower Garden Banks, Stetson Bank, Sonnier Bank, MacNeil Bank, 29 Fathom, Rankin Bright Bank, Geyer Bank, McGrail Bank, Bouma Bank, Rezak Sidner Bank, Alderice Bank, and Jakkula Bank – pristine coral areas protected by preventing the use of some fishing gear that interacts with the bottom and prohibited use of anchors (totaling 263.2 nm^2 or 487.4 km^2). Subsequently, three of these areas were established as marine sanctuaries (i.e., East and West Flower Garden Banks and Stetson Bank). Bottom anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots on coral reefs are prohibited in the East and West Flower Garden Banks, McGrail Bank, and on significant coral resources on Stetson Bank (GMFMC 2005).

Florida Middle Grounds HAPC - Pristine soft coral area (348 nm^2 or 644.5 km^2) that is protected by prohibiting the following gear types: bottom longlines, trawls, dredges, pots and traps (GMFMC and SAFMC 1982).

Pulley Ridge HAPC - A portion of the HAPC (2,300 nm^2 or 4,259 km^2) where deepwater hermatypic coral reefs are found is closed to anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots (GMFMC 2005).

Alabama Special Management Zone – For vessels operating as a charter vessel or headboat, a vessel that does not have a commercial permit for Gulf reef fish, or a vessel with such a permit fishing for Gulf reef fish, fishing is limited to hook-and-line gear with no more than three hooks. Nonconforming gear is restricted to recreational bag limits, or for reef fish without a bag limit, to 5% by weight of all fish aboard.

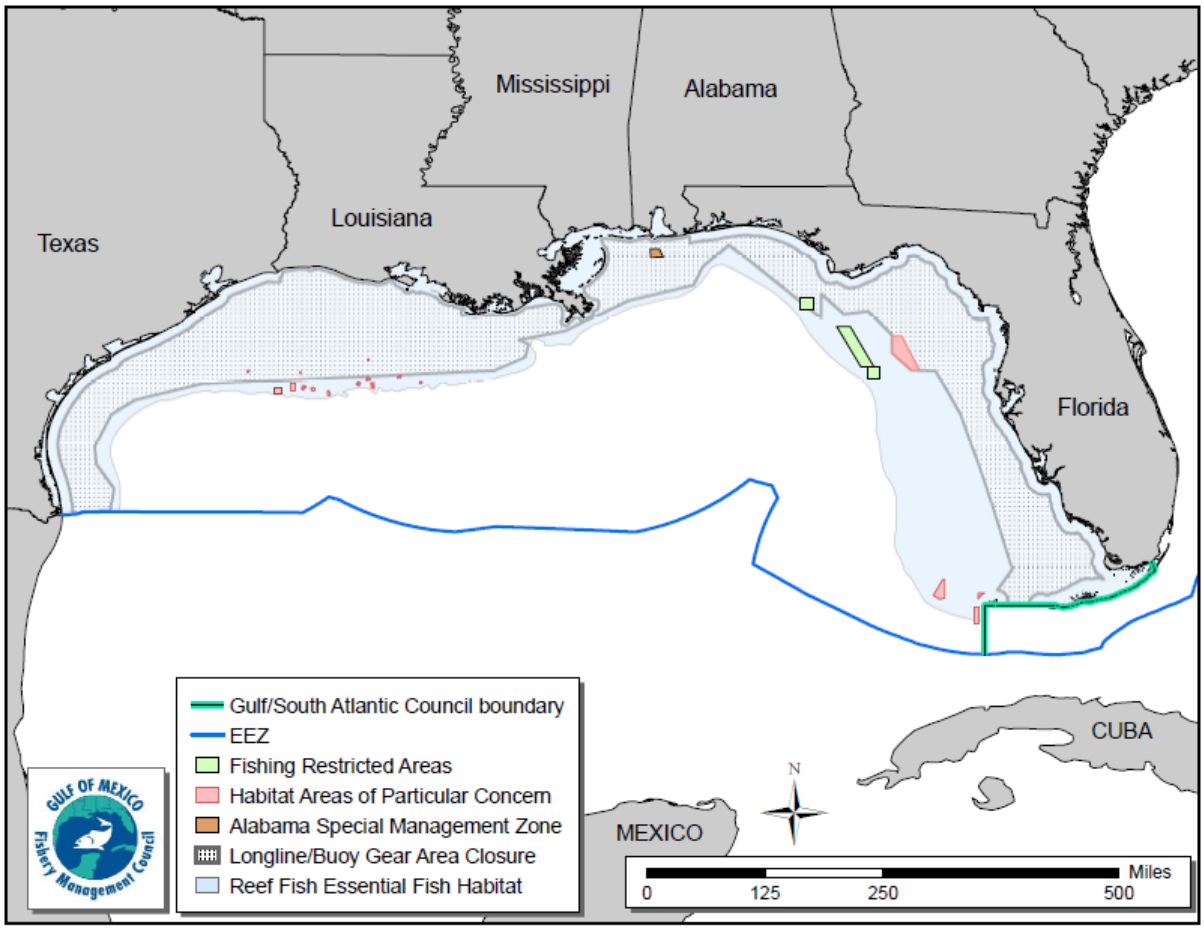

Figure 3.1.1. Map of most fishery management closed areas in the Gulf.

Deepwater Horizon MC252

The Deepwater Horizon MC252 oil spill in 2010 affected at least one-third of the Gulf area from western Louisiana east to the Florida Panhandle and south to the Campeche Bank in Mexico. The impacts of the Deepwater Horizon MC252 oil spill on the physical environment are expected to be significant and may be long-term. Oil was dispersed on the surface, and because of the heavy use of dispersants (both at the surface and at the wellhead), oil was also documented as being suspended within the water column, some even deeper than the location of the broken well head. Floating and suspended oil washed onto shore in several areas of the Gulf as were non-floating tar balls. Whereas suspended and floating oil degrades over time, tar balls are persistent in the environment and can be transported hundreds of miles.

Changes have occurred in the amount and distribution of fishing effort in the Gulf in response to the oil spill. This has made the analysis of the number of days needed for the recreational sector to fill its quota more complex and uncertain, and will make the requirement to allow the recreational sector to harvest its quota of gag and black grouper while not exceeding the quota particularly challenging. Nevertheless, substantial portions of the gag and black grouper populations are found in the northern and west Florida shelf. Thus, spawning by this segment of the stock may not be impacted, which would mitigate the overall impact of a failed spawn by that portion of the stock located in oil-affected areas.

As a result of the Deepwater Horizon MC252 spill, a consultation pursuant to ESA Section 7(a)(2) was reinitiated. On September 30, 2011, the Protected Resources Division released a biological opinion, which after analyzing best available data, the current status of the species, environmental baseline (including the impacts of the recent Deepwater Horizon MC252 oil release event in the northern Gulf), effects of the proposed action, and cumulative effects, concluded that the continued operation of the Gulf reef fish fishery is not likely to jeopardize the continued existence of green, hawksbill, Kemp's ridley, leatherback, or loggerhead sea turtles, nor the continued existence of smalltooth sawfish (NMFS 2011a). For additional information on the Deepwater Horizon MC252 oil spill and associated closures, see: http://sero.nmfs.noaa.gov/deepwater_horizon_oil_spill.htm.

3.2 Description of the Biological/Ecological Environment

A description of gag life history and biology is summarized and incorporated here by reference from Amendment 32 (GMFMC 2011b). In summary gag, and other shallow-water grouper species have typical reef fish life histories where eggs and larvae are pelagic. Gag larvae then settle to the bottom in submerged aquatic vegetation. Juvenile gag and other groupers can be found on nearshore reefs. As gag mature, they move out into deeper waters of the Gulf.

A description of black grouper life history and biology is summarized and incorporated here by reference from the Generic ACL/AM Amendment (GMFMC 2011a). In summary black grouper, have typical reef fish life histories where eggs and larvae are pelagic. Black grouper larvae settle to the bottom, and black grouper juveniles are found near shallow rocky reef habitats which had either high vertical relief with crevices, caves, or small dispersed rocks (Brulé et al. 2005). Adult black grouper are often found in higher relief habitats (Sluka et al. 1998).

Status of Gag and Black Grouper Stocks
See Section 1.1 under the Introduction.

General Information on Reef Fish Species

The following is summarized from the January 2011 Regulatory Amendment (GMFMC 2011c). The National Ocean Service of NOAA (NOS) collaborated with the NMFS and the Gulf of Mexico Fishery Management Council (Council) to develop distributions of reef fish (and other species) in the Gulf of Mexico (SEA 1998). The NOS obtained fishery-independent data sets for the Gulf of Mexico, including the Southeast Area Monitoring and Assessment Program (SEAMAP), and state trawl surveys. Data from the Estuarine Living Marine Resources (ELMR) Program contain information on the relative abundance of specific species for a series of estuaries, by five life stages and month for five seasonal salinity zones. The NOS staff analyzed the data to determine relative abundance of the mapped species by estuary, salinity zone, and month. For some species not in the ELMR database, distribution was classified as only observed or not observed for adult, juvenile, and spawning stages.

Habitat types and life history stages can be found in more detail in GMFMC (2004a). In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. In general, both eggs and larval stages are planktonic. Larvae feed on zooplankton and phytoplankton. Exceptions to these generalizations include the gray triggerfish that lay their eggs in depressions in the sandy bottom, and gray snapper whose larvae are found around submerged aquatic vegetation. Juvenile and adult reef fish are typically demersal, and are usually associated with bottom topographies on the continental shelf (<100 m) which have high relief, i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings. However, several species are found over sand and soft-bottom substrates. Some juvenile snappers (e.g. mutton, gray, red, dog, lane, and yellowtail snappers) and groupers (e.g. goliath, red, gag, and yellowfin groupers) have been documented in inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems (GMFMC 1981). More detail on hard bottom substrate and coral can be found in the Fishery Management Plan (FMP) for Corals and Coral Reefs (GMFMC and SAFMC 1982).

Status of Reef Fish Stocks

The Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico (Reef Fish FMP) currently encompasses 31 species (Table 3.2.1). Eleven other species were removed from the Reef Fish FMP in 2012 by the Council in their Generic ACL/AM Amendment. Stock assessments and stock assessment reviews may be found on the Council (www.gulfcouncil.org) and Southeast Data Assessment review (SEDAR) (http://sedarweb.org/) and have been conducted for 13 species:

- red snapper (SEDAR 7 2005; SEDAR 7 Update 2009; SEDAR 31 2013; SEDAR 31 Update 2014)
- vermilion snapper (Porch and Cass-Calay 2001; SEDAR 9 2006c; SEDAR 9 Update 2011a)
- yellowtail snapper (Muller et al. 2003; SEDAR 3 2003)
- mutton snapper (SEDAR 15A 2008;SEDAR 15A Update 2014)
- gray triggerfish (Valle et al. 2001; SEDAR 9 2006a; SEDAR 9 Update 2011b; SEDAR 43 2015)
- greater amberjack (Turner et al. 2000; SEDAR 9 2006b; SEDAR 9 Update 2010, SEDAR 33 2014b)
- hogfish (Ault et al. 2003; SEDAR 6 2004b, SEDAR 37 2013)
- red grouper (NMFS 2002; SEDAR 12 2007; SEDAR 12 Update 2009)
- gag grouper (Turner et al. 2001; SEDAR 10 2006; SEDAR 10 Update 2009, SEDAR 33 2014a)
- black grouper (SEDAR 19 2010)
- yellowedge grouper (Cass-Calay and Bahnick 2002; SEDAR 22 2011b)
- tilefish (golden) (SEDAR 22 2011a)
- goliath grouper (Porch et al. 2003; SEDAR 6 2004a; SEDAR 23 2011)

Table 3.2.1. Species of the Reef Fish FMP grouped by family.
**Note: Goliath grouper is a protected grouper.

Common Name	Scientific Name	Stock Status
Family Balistidae – Triggerfishes		
gray triggerfish	*Balistes capriscus*	Overfished, no overfishing
Family Carangidae – Jacks		
greater amberjack	*Seriola dumerili*	Overfished, overfishing
lesser amberjack	*Seriola fasciata*	Unknown
almaco jack	*Seriola rivoliana*	Unknown
banded rudderfish	*Seriola zonata*	Unknown
Family Labridae – Wrasses		
***Hogfish**	*Lachnolaimus maximus*	Not overfished, no overfishing
Family Malacanthidae – Tilefishes		
Tilefish (golden)	*Lopholatilus chamaeleonticeps*	Unknown
blueline tilefish	*Caulolatilus microps*	Unknown
goldface tilefish	*Caulolatilus chrysops*	Unknown
Family Serranidae – Groupers		
Gag	*Mycteroperca microlepis*	Not overfished, no overfishing
red grouper	*Epinephelus morio*	Not overfished, no overfishing
Scamp	*Mycteroperca phenax*	Unknown
black grouper	*Mycteroperca bonaci*	Not overfished, no overfishing
yellowedge grouper	*Hyporthodus flavolimbatus*	Not overfished, no overfishing
snowy grouper	*Hyporthodus niveatus*	Unknown
speckled hind	*Epinephelus drummondhayi*	Unknown
yellowmouth grouper	*Mycteroperca interstitialis*	Unknown
yellowfin grouper	*Mycteroperca venenosa*	Unknown
warsaw grouper	*Hyporthodus nigritus*	Unknown
****goliath grouper**	*Epinephelus itajara*	Unknown, not overfishing
Family Lutjanidae – Snappers		
queen snapper	*Etelis oculatus*	Unknown
mutton snapper	*Lutjanus analis*	Unknown
blackfin snapper	*Lutjanus buccanella*	Unknown
red snapper	*Lutjanus campechanus*	Overfished, no overfishing
cubera snapper	*Lutjanus cyanopterus*	Unknown
gray snapper	*Lutjanus griseus*	Unknown
lane snapper	*Lutjanus synagris*	Unknown
silk snapper	*Lutjanus vivanus*	Unknown
yellowtail snapper	*Ocyurus chrysurus*	Not overfished, no overfishing
vermilion snapper	*Rhomboplites aurorubens*	Not overfished, no overfishing
Wenchman	*Pristipomoides aquilonaris*	Unknown

* Hogfish genetic clusters are identified as (1) Western Florida (not including hogfish west of the Florida panhandle), (2) Florida Keys/Eastern Florida, and (3) Georgia through North Carolina.

The Western Florida and Florida Keys/Eastern Florida genetic populations converge south of Naples, Florida. Therefore, a portion of the Florida Keys/Eastern Florida population occurs within the Gulf of Mexico Council's area of jurisdiction, but the majority of the population

occurs within the South Atlantic Council's area of jurisdiction. These genetic populations have not been previously specified as distinct management stocks under South Atlantic and Gulf of Mexico Council FMPs. Recent findings indicate the Florida Keys/Eastern Florida is overfished and undergoing overfishing.

Bycatch

The reef fish fishery is multi-species and includes popular handlines. Handline gear is not selective, and therefore the vulnerability of the reef fish fishery to bycatch is high. Bycatch can negatively impact the ability of a stock to maintain itself at a level where fishing can be optimized.

Population and ecosystem effects resulting from changes in the bycatch of other species of fish and invertebrates are difficult to predict. As discussed in Amendment 30B (GMFMC 2008b), snappers, greater amberjack, gray triggerfish and other reef fishes are commonly caught in association with shallow-water grouper. Many of these species are in rebuilding plans (red snapper, gray triggerfish, and greater amberjack) with the stocks improving. Regulatory discards significantly contribute to fishing mortality in all of these reef fish fisheries.

Various studies to help gauge bycatch from the directed Reef Fish fishery (commercial or recreational) have been implemented over time, including use of logbooks, port sampling, observers and fisheries independent studies. Ward and Brooks (2010) studied the composition and disposition of bycatch and discards in the Gulf.

Protected Species

There are 28 different species of marine mammals that can or are known to occur in the Gulf. All 28 species are protected under the Marine Mammal Protection Act (MMPA) and six are also listed as endangered under the Endangered Species Act (ESA) (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales). Other species protected under the ESA occurring in the Gulf of Mexico include five sea turtle species (Kemp's Ridley, loggerhead, green, leatherback, and hawksbill); two fish species (Gulf of Mexico sturgeon and smalltooth sawfish), and two coral species (elkhorn coral and staghorn coral). Information on the distribution, biology, and abundance of these protected species in the Gulf is included in Generic EFH Amendment (GMFMC 2004a) and the February 2005, October 2009, and September 2011 ESA biological opinions on the reef fish fishery (NMFS 2005; NMFS 2009; NMFS 2011a). Marine Mammal Stock Assessment Reports and additional information are also available on the NMFS Office of Protected Species website: http://www.nmfs.noaa.gov/pr/species/.

The MMPA 2015 List of Fisheries (79 FR 14418) considers vertical line gear and longline gear as Category III gears. These gears are the dominant gear used in the reef fish fishery - vertical line (90%) and longline (5.4%) gear. This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to 1% of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. Dolphins are the only species documented as interacting with these fisheries. Bottlenose dolphins prey upon bait, catch, and/or released discards of fish from the

reef fish fishery. They are also a common predator around reef fish vessels, feeding on the discards.

All five species of sea turtles are adversely affected by the reef fish fishery. Incidental captures are relatively infrequent, but occur in all commercial and recreational hook-and-line components of the reef fishery. Loggerhead sea turtles are by far the most frequently incidentally caught sea turtles. Captured sea turtles can be released alive or can be found dead upon retrieval of the gear as a result of forced submergence. Sea turtles released alive may later succumb to injuries sustained at the time of capture or from exacerbated trauma from fishing hooks or lines that were ingested, entangling, or otherwise still attached when they were released. Sea turtle release gear and handling protocols are required in the commercial and for- hire reef fish fisheries to minimize post-release mortality.

Smalltooth sawfish also interact with the reef fish fishery, but to a much lesser extent. Smalltooth sawfish primarily occur in the Gulf off peninsular Florida. Incidental captures in the commercial and recreational hook-and-line components of the reef fish fishery are rare events, with only eight smalltooth sawfish estimated to be incidentally caught every three years, and none are expected to result in mortality (NMFS 2011a). Fishermen are required to follow smalltooth sawfish safe handling guidelines. The long, toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in fishing gear.

NMFS has conducted specific analyses (Section 7 consultations) to evaluate potential effects from the reef fish fishery on species and critical habitats protected under the ESA. On September 30, 2011, the Protected Resources Division released a biological opinion (Opinion), which concluded that the continued operation of the Gulf reef fish fishery is not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) or smalltooth sawfish (NMFS 2011a). The Opinion also concluded that other ESA-listed species are not likely to be adversely affected by the Reef Fish Fishery Management Plan (FMP). An incidental take statement was issued specifying the amount and extent of anticipated take, along with reasonable and prudent measures and associated terms and conditions deemed necessary and appropriate to minimize the impact of these takes. The Council addressed further measures to reduce take in the reef fish fishery's longline component in Amendment 31 (GMFMC 2009).

Subsequent to the completion of the biological opinion, NMFS published final rules listing 20 new coral species (September 10, 2014), and designating critical habitat for the Northwest Atlantic Ocean distinct population segment of loggerhead sea turtles (July 10, 2014). NMFS addressed these changes in a series of consultation memoranda. In a consultation memorandum dated October 7, 2014, NMFS assessed the continued operation of the Gulf reef fish fishery's potential impact on the newly-listed coral species occurring in the Gulf of Mexico (3 species of *Orbicella* and *Mycetophyllia ferox*) and concluded the fishery is not likely to adversely affect any of the protected coral species. Similarly, in a consultation memorandum dated September 16, 2014, NMFS assessed the continued authorization of South Atlantic and Gulf fisheries' potential impacts on loggerhead critical habitat and concluded the Gulf reef fish fishery is not likely to adversely affect the newly designated critical habitat.

3.3 Description of the Economic Environment

A description of the Gulf gag stock is provided in Section 3.2. Details on the economic environment for both sectors of the grouper component of the Gulf reef fish fishery are provided in the 2010 Red Grouper Regulatory Amendment (GMFMC 2010) and the environmental assessment for the 2011 gag interim rule (NMFS 2010) and are incorporated herein by reference. The following section contains updated information on the economic environment of this fishery.

3.3.1 Commercial Sector

Additional information on the commercial sector is not provided because this framework action would only change management measures for the recreational sector.

3.3.2 Recreational Sector

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

Landings

The majority of recreational Gulf gag landings (2010 through 2014) were estimated to occur in West Florida on private vessels (Table 3.3.2.1 and Table 3.3.2.2). On average (2010 through 2014), most of the estimated gag landings occurred during waves three through six (May through December), with a peak in wave four (July and August) (Table 3.3.2.3).

Table 3.3.2.1. Recreational landings in pounds (lbs) gutted weight (gw) and percent distribution of gag across all modes, by state, 2010 – 2014.

	AL	AL/FLW*	FLW	LA/MS**	TX
	Landings (lbs gw)				
2010	30,003	69,821	1,581,451	6,739	1,858
2011	633	48,384	683,915	22,914	860
2012	4,496	43,518	973,167	813	2,237
2013	1,559	0	1,520,669	1,890	3,006
2014	2,759	0	902,845	2,059	178
Average	7,890	32,345	1,132,409	6,883	1,628
	Percent Distributions				
2010	1.8%	4.1%	93.6%	0.4%	0.1%
2011	0.1%	6.4%	90.4%	3.0%	0.1%
2012	0.4%	4.2%	95.0%	0.1%	0.2%
2013	0.1%	0.0%	99.6%	0.1%	0.2%
2014	0.3%	0.0%	99.4%	0.2%	0.0%
Average	0.5%	3.0%	95.6%	0.8%	0.1%

Source: SEFSC Marine Recreational Information Program (MRIP) ACL dataset with LA Creel add-on (July 2015).
* Beginning in 2013, NMFS Southeast Region Headboat Survey (SRHS) data was reported separately for NW Florida and Alabama.
** Landings data from Louisiana and Mississippi are combined for confidentiality purposes.
Note: Landings are post stratified to exclude Monroe County, FL.

Table 3.3.2.2. Recreational landings (lbs gw) and percent distribution of gag across all states, by mode, 2010 - 2014.

	Landings (lbs gw)				Percent Distribution			
	Charter boat	**Headboat**	**Private**	**Shore**	**Charter boat**	**Headboat**	**Private**	**Shore**
2010	427,432	70,718	1,146,105	45,618	25.3%	4.2%	67.8%	2.7%
2011	99,029	48,834	604,496	4,346	13.1%	6.5%	79.9%	0.6%
2012	384,910	44,249	587,664	7,408	37.6%	4.3%	57.4%	0.7%
2013	165,196	34,117	1,327,811	0	10.8%	2.2%	86.9%	0.0%
2014	93,125	40,728	773,987	0	10.3%	4.5%	85.3%	0.0%
Average	233,938	47,729	888,013	11,474	19.4%	4.3%	75.5%	0.8%

Source: SEFSC MRIP ACL dataset with LA Creel add-on (July 2015).
Note: Landings are post stratified to exclude Monroe County, FL.

Table 3.3.2.3. Recreational landings (lbs gw) and percent distribution of gag, by wave, 2010-2014.

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)
	Landings (lbs gw)					
2010	71,881	179,819	622,772	220,257	240,598	354,544
2011	47,883	141,917	135,203	7,302	285,981	138,418
2012	920	52,190	169,401	498,764	302,524	432
2013	11,547	94	83,989	958,115	267,090	206,287
2014	2,155	9,621	76,133	296,875	198,063	324,993
Average	26,877	76,728	217,500	396,263	258,851	204,935
	Percent Distribution					
2010	4.3%	10.6%	36.9%	13.0%	14.2%	21.0%
2011	6.3%	18.8%	17.9%	1.0%	37.8%	18.3%
2012	0.1%	5.1%	16.5%	48.7%	29.5%	0.0%
2013	0.8%	0.0%	5.5%	62.7%	17.5%	13.5%
2014	0.2%	1.1%	8.4%	32.7%	21.8%	35.8%
Average	2.3%	7.1%	17.0%	31.6%	24.2%	17.7%

Source: SEFSC MRIP ACL dataset with LA Creel add-on (July 2015).
Note: Landings are post stratified to exclude Monroe County, FL.

Black grouper landings were estimated to be much lower than gag landings from 2010 through 2014 (Table 3.3.2.4). Although not shown, on average (2010 through 2014), approximately 74% of these estimated landings occurred in West Florida through Alabama and 26% occurred in Texas. There were no estimated black grouper landings for Louisiana or Mississippi during this time period.

Table 3.3.2.4. Recreational landings (lbs gw) and percent distribution of black grouper across all states, by mode, 2010 - 2014.

	Landings (lbs gw)				Percent Distribution			
	Charter boat	**Headboat**	**Private**	**Shore**	**Charter boat**	**Headboat**	**Private**	**Shore**
2010	0	331	0	0	0.0%	100.0%	0.0%	0.0%
2011	0	565	0	0	0.0%	100.0%	0.0%	0.0%
2012	0	1,174	24,858	0	0.0%	4.5%	95.5%	0.0%
2013	170	2,161	902	0	5.3%	66.8%	27.9%	0.0%
2014	0	745	0	0	0.0%	100.0%	0.0%	0.0%
Average	34	995	5,152	0	1.1%	74.3%	24.7%	0.0%

Source: SEFSC Marine Recreational Fisheries Statistical Survey (MRFSS) ACL dataset (July 2015).
Note: Landings are post stratified to exclude Monroe County, FL.

Angler Effort

Recreational effort derived from the Marine Recreational Information Program (MRIP) database can be characterized in terms of the number of trips as follows:

- 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.
- 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.
- Total recreational trips - The total estimated number of recreational trips in the Gulf, regardless of target intent or catch success.

Other measures of effort are possible, such as directed trips (the number of individual angler trips that either targeted or caught a particular species), among other measures.

Gag Effort

Almost all of the estimated target and catch trips for Gulf gag occurred in West Florida from 2010 through 2014 (Table 3.3.2.5 and Table 3.3.2.6). The majority of this estimated effort was recorded from the private mode. Although there were very few gag landings recorded from the shore mode, as discussed earlier, there was a moderate amount of estimated gag target and catch effort from 2010 through 2014. This suggests that recreational fishermen are targeting gag from shore in Florida and are catching and releasing a substantial number of these fish, likely due to state-enforced size limit restrictions. On average (2010 through 2014), about 60% of gag target effort was estimated to occur in waves four and five (July through October), whereas estimated gag catch effort was more evenly distributed throughout the year (Table 3.3.2.7 and Table 3.3.2.8). Estimates of gag target or catch effort for additional years, and other measures of directed effort, are available at http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.

Table 3.3.2.5. Number of gag recreational target trips, by mode and state, 2010-2014*.

	Alabama	West Florida	Mississippi	Total
	Shore Mode			
2010	0	47,441	0	47,441
2011	0	26,233	0	26,233
2012	0	10,269	0	10,269
2013	0	32,956	0	32,956
2014	0	6,238	0	6,238
Average	0	24,627	0	24,627
	Charter Mode			
2010	0	23,746	0	23,746
2011	433	5,357	0	5,790
2012	0	26,271	0	26,271
2013	138	19,799	0	19,937
2014	0	15,447	0	15,447
Average	114	18,124	0	18,238
	Private/Rental Mode			
2010	429	343,183	0	343,612
2011	0	186,536	0	186,536
2012	0	185,396	0	185,396
2013	1,146	417,054	127	418,328
2014	0	244,591	906	245,498
Average	315	275,352	207	275,874
	All Modes			
2010	429	414,370	0	414,799
2011	433	218,126	0	218,558
2012	0	221,936	0	221,936
2013	1,284	469,809	127	471,220
2014	0	266,275	906	267,182
Average	429	318,103	207	318,739

Source: MRIP database, NOAA Fisheries, NMFS, SERO.
* Texas and headboat information unavailable. No gag target effort was recorded in Louisiana from 2010 through 2013. MRIP sampling was not conducted in Louisiana in 2014.
Note: Effort estimates have been post-stratified to exclude Monroe County, FL.

Table 3.3.2.6. Number of gag recreational catch trips, by mode and state, 2010-2014*.

	Alabama	West Florida	Louisiana	Mississippi	Total
	Shore Mode				
2010	496	93,273	0	0	93,769
2011	0	65,239	0	0	65,239
2012	705	49,354	0	0	50,059
2013	0	34,171	0	0	34,171
2014	0	51,228	NA**	0	51,228
Average	240	58,653	0	0	58,893
	Charter Mode				
2010	2,327	111,205	692	0	114,223
2011	395	66,551	102	0	67,048
2012	1,024	106,781	665	0	108,470
2013	1,960	108,802	0	0	110,761
2014	580	48,441	NA**	0	49,021
Average	1,257	88,356	365	0	89,905
	Private/Rental Mode				
2010	6,027	617,870	0	1,008	624,906
2011	3,559	308,274	12,147	0	323,980
2012	2,492	319,990	4,518	0	327,000
2013	7,386	449,991	503	1,739	459,619
2014	1,025	356,753	NA**	0	357,778
Average	4,098	410,576	4,292	549	418,657
	All Modes				
2010	8,849	822,348	692	1,008	832,898
2011	3,953	440,064	12,249	0	456,267
2012	4,221	476,125	5,183	0	485,529
2013	9,346	592,963	503	1,739	604,551
2014	1,605	456,421	NA**	0	458,027
Average	5,595	557,584	4,657	549	567,454

Source: MRIP database, NOAA Fisheries, NMFS, SERO.
* Texas and headboat information unavailable.
** MRIP sampling was not conducted in Louisiana in 2014, so these values are not available. The averages for Louisiana include only 2010 through 2013.
Note: Effort estimates have been post-stratified to exclude Monroe County, FL.

Table 3.3.2.7. Gag target trips and percent distribution across all modes and states, by wave, 2010 – 2014*.

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)
	Gag Target Trips					
2010	40,824	41,185	92,016	77,522	78,641	84,611
2011	31,902	46,992	38,216	8,070	70,798	22,580
2012	17,013	2,914	8,079	115,223	75,887	2,821
2013	3,432	6,431	38,831	206,364	128,345	87,818
2014**	3,539	1,307	16,715	132,587	52,295	60,738
Average	19,342	19,766	38,771	107,953	81,193	51,714
	Percent Distribution					
2010	9.8%	9.9%	22.2%	18.7%	19.0%	20.4%
2011	14.6%	21.5%	17.5%	3.7%	32.4%	10.3%
2012	7.7%	1.3%	3.6%	51.9%	34.2%	1.3%
2013	0.7%	1.4%	8.2%	43.8%	27.2%	18.6%
2014**	1.3%	0.5%	6.3%	49.6%	19.6%	22.7%
Average	7%	7%	12%	34%	26%	15%

Source: MRIP database, NOAA Fisheries, NMFS, SERO.
* Texas and headboat information unavailable.
** Louisiana effort information is unavailable for 2014; however, based on historical data, it is unlikely that any gag target trips occurred in Louisiana in 2014.
Note: Effort estimates have been post-stratified to exclude Monroe County, FL.

Table 3.3.2.8. Gag catch trips and percent distribution across all modes and states, by wave, 2010 – 2014*.

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov Dec)
	Gag Catch Trips					
2010	56,304	76,289	241,278	151,260	171,831	135,935
2011	36,767	94,367	116,498	68,319	86,539	53,777
2012	55,163	76,907	84,939	132,668	92,734	43,118
2013	47,824	60,472	122,214	185,587	97,939	90,515
2014**	45,253	62,159	60,255	103,192	91,622	95,546
Average	48,262	74,039	125,037	128,205	108,133	83,778
	Percent Distribution					
2010	6.8%	9.2%	29.0%	18.2%	20.6%	16.3%
2011	8.1%	20.7%	25.5%	15.0%	19.0%	11.8%
2012	11.4%	15.8%	17.5%	27.3%	19.1%	8.9%
2013	7.9%	10.0%	20.2%	30.7%	16.2%	15.0%
2014**	9.9%	13.6%	13.2%	22.5%	20.0%	20.9%
Average	9%	14%	21%	23%	19%	15%

Source: MRIP database, NOAA Fisheries, NMFS, SERO.
* Texas and headboat information unavailable.
** Louisiana effort information is unavailable for 2014; however, based on historical data, this is not expected to have a noticeable impact on 2014 Gulf totals.
Note: Effort estimates have been post-stratified to exclude Monroe County, FL.

Black Grouper Effort

There were far fewer estimated target and catch trips for black grouper in the Gulf than there were for gag from 2010 through 2014. The only Gulf state with black grouper target trips recorded by MRIP during this time was Florida and these trips were sparse (Table 3.3.2.9). Black grouper catch effort in Florida was more substantial than target effort was, but was still low compared to that of gag (Table 3.3.2.10). There were a small number of black grouper catch trips estimated for Alabama in 2010 and 2012; however, these MRIP estimates were expanded from only two intercepted trips.

Table 3.3.2.9. Black grouper recreational target trips, by mode and state, 2010-2014*.

	West Florida**			
	Shore Mode	**Charter Mode**	**Private/Rental Mode**	**All Modes**
2010	0	0	2,763	2,763
2011	892	2,306	0	3,198
2012	0	0	0	0
2013	0	0	2,097	2,097
2014	0	0	194	194
Average	178	461	1,011	1,650

Source: MRIP database, NOAA Fisheries, NMFS, SERO.
*Texas and headboat information unavailable.
**Florida was the only state with recorded target effort for black grouper.
Note: Effort estimates have been post-stratified to exclude Monroe County, FL.

Table 3.3.2.10. Black grouper recreational catch trips, by mode and state, 2010-2014*.

	Alabama	West Florida	Total
	Shore Mode		
2010	0	0	0
2011	0	3,124	3,124
2012	0	5,220	5,220
2013	0	4,019	4,019
2014	0	10,946	10,946
Average	0	4,662	4,662
	Charter Mode		
2010	0	0	0
2011	0	0	0
2012	0	0	0
2013	0	69	69
2014	0	0	0
Average	0	14	14
	Private/Rental Mode		
2010	398	5,287	5,685
2011	0	9,720	9,720
2012	1,526	16,170	17,696
2013	0	33,300	33,300
2014	0	23,405	23,405
Average	385	17,576	17,961
	All Modes		
2010	398	5,287	5,685
2011	0	12,844	12,844
2012	1,526	21,390	22,916
2013	0	37,388	37,388
2014	0	34,350	34,350
Average	385	22,252	22,637

Source: MRIP database, NOAA Fisheries, NMFS, SERO.
*Texas and headboat information unavailable. No catch effort was recorded for black grouper in Louisiana or Mississippi.
Note: Effort estimates have been post-stratified to exclude Monroe County, FL.

Similar analysis of recreational effort is not possible for the headboat mode because headboat data are not collected at the angler level. Estimates of effort by the headboat mode are provided

in terms of angler days, or the total number of standardized full-day angler trips[3]. The stationary "fishing for demersal species" nature of headboat fishing, as opposed to trolling, suggests that most headboat trips and, hence, angler days, are demersal or reef fish trips by intent. According to a recent survey of the recreational for-hire industry in the Gulf of Mexico, approximately 84% of headboat trips, on average, target reef fish species such as snappers or groupers (Savolainen et al. 2012).

The distribution of headboat effort (angler days) by geographic area is presented in Table 3.3.2.11. For purposes of data collection, the headboat data collection program divides the Gulf into several areas. In Table 3.3.2.11, FLW refers to areas in Florida from the Dry Tortugas through the Florida Middle Grounds, FL-AL covers Northwest Florida and Alabama, MS-LA refers to the combined coastlines of Mississippi and Louisiana, and TX includes areas in Texas from Sabine Pass-Freeport south to Port Isabel. The number of headboat angler days in West Florida through Alabama increased steadily from 2010 through 2014. In Texas, the number of angler days was relatively constant from 2010 through 2014, with a peak in 2013. In Mississippi through Louisiana, the number of angler days rose dramatically in 2011, following a five-year low in 2010, and then remained mostly stable through 2014, with a peak in 2012. The low number of angler days in 2010, especially in the area from Northwest Florida through Louisiana, could be due in part to the Deepwater Horizon oil spill, associated closures and its effect on angler demand for headboat trips (see Section 3.1).

Table 3.3.2.11. Headboat angler days and percent distribution, by state, 2010 - 2014.

	Angler Days				Percent Distribution			
	FLW	**FL-AL***	**MS-LA****	**TX**	**FLW**	**FL-AL**	**MS-LA**	**TX**
2010	70,424	40,594	715	47,154	44.3%	25.5%	0.5%	29.7%
2011	79,722	77,303	3,657	47,284	38.3%	37.2%	1.8%	22.7%
2012	84,205	77,770	3,680	51,776	38.7%	35.8%	1.7%	23.8%
2013	94,752	80,048	3,406	55,749	40.5%	34.2%	1.5%	23.8%
2014	102,841	88,524	3,257	51,231	41.8%	36.0%	1.3%	20.8%
Average	86,389	72,848	2,943	50,639	40.7%	33.7%	1.3%	24.2%

Source: NMFS Southeast Region Headboat Survey (SRHS).
*Beginning in 2013, HBS data was reported separately for NW Florida and Alabama, but has been combined here for consistency with previous years.
**Headboat data from Mississippi and Louisiana are combined for confidentiality purposes.

Headboat effort in terms of angler days for the entire Gulf was concentrated most heavily during the summer months of June through August on average (2010 through 2014) (Table 3.3.2.12). The monthly trend in angler days was very similar across years, building gradually from January through May, rising sharply to a peak in June and July, dropping rapidly through September, increasing slightly in October, then tapering through December.

[3] Headboat trip categories include half-, three-quarter-, full-, and 2-day trips. A full-day trip equals one angler day, a half-day trip equals .5 angler days, etc. Angler days are not standardized to an hourly measure of effort and actual trip durations may vary within each category.

Table 3.3.2.12. Headboat angler days and percent distribution, by month, 2010 - 2014.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Headboat Angler Days											
2010	4,962	5,709	13,186	18,077	14,029	26,495	22,616	14,378	8,759	16,328	9,488	4,860
2011	5,242	9,174	16,378	17,626	16,148	39,775	42,089	22,513	10,766	12,609	8,514	7,132
2012	7,924	9,364	18,326	16,404	17,708	39,662	46,468	21,440	12,629	13,281	7,135	7,090
2013	8,630	9,576	16,759	16,426	17,150	47,791	38,304	27,610	12,697	21,256	8,654	9,102
2014	7,069	12,402	18,626	18,733	21,345	44,342	46,246	30,893	12,089	17,395	7,557	9,156
Avg	6,765	9,245	16,655	17,453	17,276	39,613	39,145	23,367	11,388	16,174	8,270	7,468
	Percent Distribution											
2010	3.1%	3.6%	8.3%	11.4%	8.8%	16.7%	14.2%	9.0%	5.5%	10.3%	6.0%	3.1%
2011	2.5%	4.4%	7.9%	8.5%	7.8%	19.1%	20.2%	10.8%	5.2%	6.1%	4.1%	3.4%
2012	3.6%	4.3%	8.4%	7.5%	8.1%	18.2%	21.4%	9.9%	5.8%	6.1%	3.3%	3.3%
2013	3.7%	4.1%	7.2%	7.0%	7.3%	20.4%	16.4%	11.8%	5.4%	9.1%	3.7%	3.9%
2014	2.9%	5.0%	7.6%	7.6%	8.7%	18.0%	18.8%	12.6%	4.9%	7.1%	3.1%	3.7%
Avg	3.2%	4.3%	7.9%	8.4%	8.2%	18.5%	18.2%	10.8%	5.4%	7.7%	4.0%	3.5%

Source: NMFS Southeast Region Headboat Survey (SRHS).

Permits

For-hire vessels are required to have a Charter/Headboat for Reef Fish permit (for-hire permit) to fish for or possess reef fish species in the Gulf EEZ. This sector is currently under a permit limitation program since June, 2006. On September 1, 2015, there were 1,284 valid (non-expired) or renewable[4] Gulf for-hire permits. Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, only federally permitted headboats are required to submit harvest and effort information to the NMFS SRHS. Participation in the SRHS is based on determination by the Southeast Fishery Science Center (SEFSC) that the vessel primarily operates as a headboat. As of April 24, 2015, 69 Gulf headboats were registered in the SRHS (K. Fitzpatrick, NMFS SEFSC, pers. comm.). The majority of these headboats were located in Florida (37), followed by Texas (16), Alabama (9), and Mississippi/Louisiana (7).

Information on Gulf charter boat and headboat operating characteristics is included in Savolainen et al. (2012) and is incorporated herein by reference.

There are no specific federal permitting requirements for recreational anglers to fish for or harvest reef fish, including gag and black grouper. Instead, anglers are required to possess either

[4] A renewable permit is an expired permit that may not be actively fished, but is renewable for up to one year after expiration.

a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. As a result, it is not possible to identify with available data how many individual anglers would be expected to be affected by this proposed amendment.

Economic Value

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 (CS). 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. The estimated value of the CS for catching and keeping a second grouper on an angler trip is approximately $103 (values updated to 2014 dollars[5]), and decreases thereafter (approximately $69 for a third grouper, $51 for a fourth grouper, and $40 for a fifth grouper) (Carter and Liese 2012). Values by specific grouper species are not available.

The foregoing estimates of economic value should not be confused with economic impacts associated with recreational fishing expenditures. Although 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.

With regards to for-hire businesses, economic value can be measured by producer surplus (PS) per passenger trip (the amount of money that a vessel owner earns in excess of the cost of providing the trip). Estimates of the PS per for-hire passenger trip are not available. Instead, net operating revenue (NOR), which is the return used to pay all labor wages, returns to capital and owner profits, is used as a proxy for PS. The estimated NOR value is $153 (2014 dollars) per charter angler trip (Liese and Carter 2011). The estimated NOR value per headboat angler trip is $53 (2014 dollars) (C. Liese, NMFS SEFSC, pers. comm.). Estimates of NOR per gag or black grouper target trip are not available.

Business Activity

The desire for recreational fishing generates economic activity as consumers spend their income on various goods and services needed for recreational fishing. This spurs economic activity in the region where recreational fishing occurs. It should be clearly noted that, in the absence of the opportunity to fish, the income would presumably be spent on other goods and services and these expenditures would similarly generate economic activity in the region where the expenditure occurs. As such, the analysis below represents a distributional analysis only.

[5] Converted to 2014 dollars using the 2014 annual Consumer Price Index (CPI) for all US urban consumers provided by the Bureau of Labor and Statistics (BLS).

Estimates of the business activity (economic impacts) associated with recreational angling for gag and black grouper were derived using average impact coefficients for recreational angling for all species, as derived from an add-on survey to the Marine Recreational Fisheries Statistical Survey (MRFSS). This add-on survey collected economic expenditure information, as described and utilized in NMFS (2011b). Estimates of the average expenditures by recreational anglers are also provided in NMFS (2011b) and are incorporated herein by reference.

Recreational fishing generates business activity (economic impacts). Business activity for the recreational sector is characterized in the form of full-time equivalent jobs, output (sales) impacts (gross business sales), and value-added impacts (difference between the value of goods and the cost of materials or supplies). Estimates of the average gag target effort (2010-2014) and associated business activity (2014 dollars) are provided in Table 3.3.2.13. The average impact coefficients, or multipliers, used in the model are invariant to the "type" of effort and can therefore be directly used to measure the impact of other effort measures such as gag catch trips. To calculate the multipliers from Table 3.3.2.13, simply divide the desired impact measure (output impact, value-added impact, or jobs) associated with a given state and mode by the number of target trips for that state and mode.

The estimates provided in Table 3.3.2.13 only apply at the state-level. These numbers should not be added across the region. Addition of the state-level estimates to produce a regional (or national) total could either under- or over-estimate the actual amount of total business activity because of the complex relationship between different jurisdictions and the expenditure/impact multipliers. Neither regional nor national estimates are available at this time.

Florida clearly received the greatest level of economic impact from gag in comparison to the other Gulf States, which is not surprising given the majority of gag target trips are estimated to be taken by Florida anglers (Table 3.3.2.13). Although not shown, on average (2010 through 2014), black grouper target trips in West Florida across all modes were estimated to generate approximately $408,000 (2014 dollars) in output impact, $266,000 in value added impact, and 4 jobs. There were no target trips for black grouper in the other Gulf States.

Estimates of the business activity associated with headboat effort are not available. Headboat vessels are not covered in the MRIP, so, in addition to the absence of estimates of target effort, estimation of the appropriate business activity coefficients for headboat effort has not been conducted.

Table 3.3.2.13. Summary of gag target trips (2010-2014 average) and associated business activity (2014 dollars). Output and value added impacts are not additive.

	Alabama	West Florida	Louisiana*	Mississippi	Texas
	Shore Mode				
Target Trips	0	24,627	0	0	**
Output Impact	$0	$1,199,533	$0	$0	**
Value Added Impact	$0	$668,531	$0	$0	**
Jobs	0	11	0	0	**
	Private/Rental Mode				
Target Trips	315	275,352	0	207	**
Output Impact	$17,300	$15,131,579	$0	$7,404	**
Value Added Impact	$9,362	$8,568,328	$0	$3,766	**
Jobs	0	129	0	0	**
	Charter Mode				
Target Trips	114	18,124	0	0	**
Output Impact	$74,033	$13,506,432	$0	$0	**
Value Added Impact	$50,664	$9,029,775	$0	$0	**
Jobs	1	117	0	0	**
	All Modes				
Target Trips	429	318,103	0	207	**
Output Impact	$91,333	$29,837,544	$0	$7,404	**
Value Added Impact	$60,026	$18,266,634	$0	$3,766	**
Jobs	1	257	0	0	**

Source: effort data from MRIP, economic impact results calculated by NMFS SERO using the model developed for NMFS (2011b).
* MRIP sampling was not conducted in Louisiana in 2014, so Louisiana estimates reported here are based on average gag target effort for 2010 through 2013 only.
** Because target information is unavailable, associated business activity cannot be calculated.

3.4 Description of the Social Environment

This framework action affects recreational management of gag and black grouper.

Gag and black grouper are part of the shallow-water grouper complex. This group consists of gag, red grouper, and the four grouper species that make up the other shallow-water grouper complex (scamp, black, yellowfin, and yellowmouth grouper). Currently recreational regulations for gag and black grouper include a daily bag or possession limit, fishing seasons, and minimum size limits. Shallow-water grouper species are part of a four-fish combined grouper total daily bag or possession limit. Specific daily limits for black grouper and gag include limits of four black grouper per person as part of the four-fish combined grouper total and two gag per person within the four-fish combined grouper total. All shallow-water grouper is closed for recreational

fishing from February 1st through March 31st when fishing beyond the 20-fathom break. Gag is open from July 1st through December 2nd and is subject to an in-season closure. The minimum recreational size limit is currently set for black grouper and gag at 22 inches TL.

A description of the social environment including analysis of communities engaged in gag and black grouper fishing was provided in Amendment 38 (GMFMC 2012b) and is incorporated here by reference. In summary, the referenced description highlights that, from a socio-cultural perspective, gag is the most important of the shallow-water grouper species as it is the declared target species for the most recreational bottom-fishing trips. The referenced information includes a description of the proportion of recreational landings by species within the other shallow-water grouper complex over time. In addition, descriptions of top grouper communities are included.

Updated information on effort including gag and black grouper target effort is included in Section 3.3.2. The following description contains updated information on recent recreational landings of gag and black grouper. Information is summarized by state and by mode. In addition, descriptions of top Gulf recreational fishing communities are included and indices of recreational reliance and engagement are summarized. And lastly, minority, poverty, and social vulnerability data are presented to assess the potential for environmental justice concerns.

Recreational Fishing Communities

Gag

Over the past five years, Gulf recreational landings for gag have ranged from 756,705 lbs gutted weight to 1,689,872 lbs gutted weight (2010 – 2014, Table 3.3.2.1). By state, the majority of Gulf gag caught by recreational anglers is landed in West Florida through Alabama (99.3% on average for years 2010 - 2014, Table 3.3.2.1) with the bulk of gag caught in West Florida. The remainder of Gulf recreational gag is landed Louisiana and Mississippi (average of 0.6% per year, Table 3.3.2.1) and Texas (0.1%). Landings of gag in Florida are the greatest in West Florida (68% of Gulf region for years 2010-2014, Table 1.1.1) and in the Panhandle (31% of Gulf region). A small amount of gag is landed in Monroe County (less than 1% in the Gulf and a range of 1,007 lbs gutted weight to 19,839 lbs gutted weight in the South Atlantic for years 2010-2014, Table 1.1.1). The majority of recreational gag landings that occur in Monroe County are attributed to the South Atlantic and counted toward the South Atlantic ACL. However, Monroe County, which includes the Florida Keys, is the area in which inconsistent regulations between Councils would affect anglers. By mode, anglers fishing from private vessels represent on average 75.5% of the recreational landings, followed by charter boats (19.4%); headboats represent on average 4.3% of recreational landings (Table 3.3.2.2).

Black grouper

Over the past five years, Gulf recreational landings for black grouper have ranged from 331 lbs gutted weight to 26,032 lbs gutted weight (2010 – 2014, Table 3.3.2.4). Black grouper is harvested recreationally in Florida, Alabama, and Texas. As reported in Section 3.3.2, the majority of Gulf black grouper caught by recreational anglers is landed in West Florida through Alabama (74% on average for years 2010 - 2014, SEFSC MRFSS/MRIP ACL Dataset), followed by Texas (26%). However, Gulf-wide recreational landings of black grouper are very

small in comparison to the amount of black grouper landed in Monroe County, Florida (Monroe County landings have ranged from greater than 17,097 lbs gutted weight to 49,585 lbs gutted weight for years 2010-2014, Table 1.1.2). The majority of recreational black grouper landings that occur in the waters around Monroe County are attributed to the South Atlantic and counted toward the South Atlantic ACL. However, Monroe County, which includes the Florida Keys, is the area in which inconsistent regulations between Councils would affect anglers. By mode, anglers fishing from headboats represent on average 74.3% of Gulf recreational landings, followed by private vessels (24.7%); charter boats represent on average 1.1% of recreational landings (Table 3.3.2.4).

Landings for the recreational sector are not available by species at the community level; therefore, it is not possible with available information to identify communities as dependent on recreational fishing for gag and black grouper. Because limited data are available concerning how recreational fishing communities are engaged and reliant on specific species, a set of indices were created using secondary data from permit and infrastructure information for the southeast recreational fishing sector at the community level (Jepson and Colburn 2013; Jacob et al. 2013). Using a principal component and single solution factor analysis, each community receives a factor score for each index to compare to other communities. With a selected group of communities that may have gag grouper and black groupers fishing activity, factor scores of both engagement and reliance were plotted onto bar graphs. Factor scores are denoted by colored bars and are standardized, therefore the mean is zero. Two thresholds of one and ½ standard deviation above the mean are plotted onto the graphs to help determine a threshold for significance. Figure 3.4.1 identifies the recreational communities that are engaged and reliant upon fishing in general. Using thresholds of fishing dependence of ½ standard deviation and one standard deviation, Figure 3.4.1 suggests that several communities are substantially engaged in recreational fishing. Because the analysis used discrete geo-political boundaries, Panama City and Panama City Beach had separate values for the associated variables. Calculated independently, each still ranked high enough to appear in the top 16 list suggesting a greater importance for recreational fishing in that area.

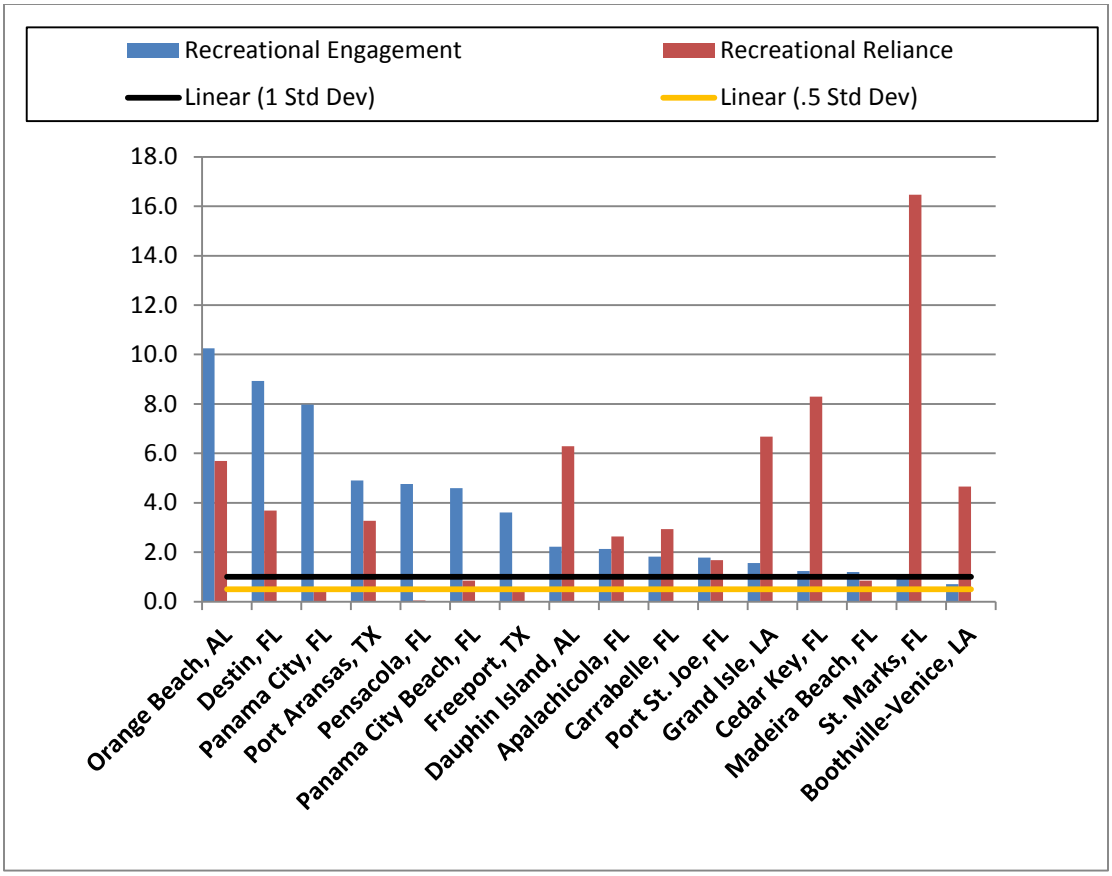

Figure 3.4.1. Top 16 recreational fishing communities' engagement and reliance. Source: SERO, Social indicators database (2012).

Environmental Justice Considerations

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. The main focus of Executive Order 12898 is to consider "the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" This executive order is generally referred to as environmental justice (EJ).

The proposed actions could be expected to affect recreational fishermen and associated industries in numerous communities along the Gulf of Mexico coast. However, information on the race and income status for groups at the different participation levels (individual fishermen, for-hire vessel owners, crew, employees of associated support industries, etc.) is not available. Although information is available concerning communities overall status with regard to minorities and poverty (e.g., census data), such information is not available

specific to fishermen and those involved in the industries and activities, themselves. To help assess whether any environmental justice concerns arise from the actions in this framework, a suite of indices were created to examine the social vulnerability of coastal communities. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and households with children under the age of five, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of populations experiencing vulnerabilities. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Figure 3.4.2 provides the social vulnerability of recreationally engaged communities. Three communities exceed the threshold of one standard deviation above the mean for two of the indices (Freeport, Texas; Apalachicola and Carrabelle, Florida), and would be the communities most likely to exhibit vulnerabilities to social or economic disruption due to regulatory change.

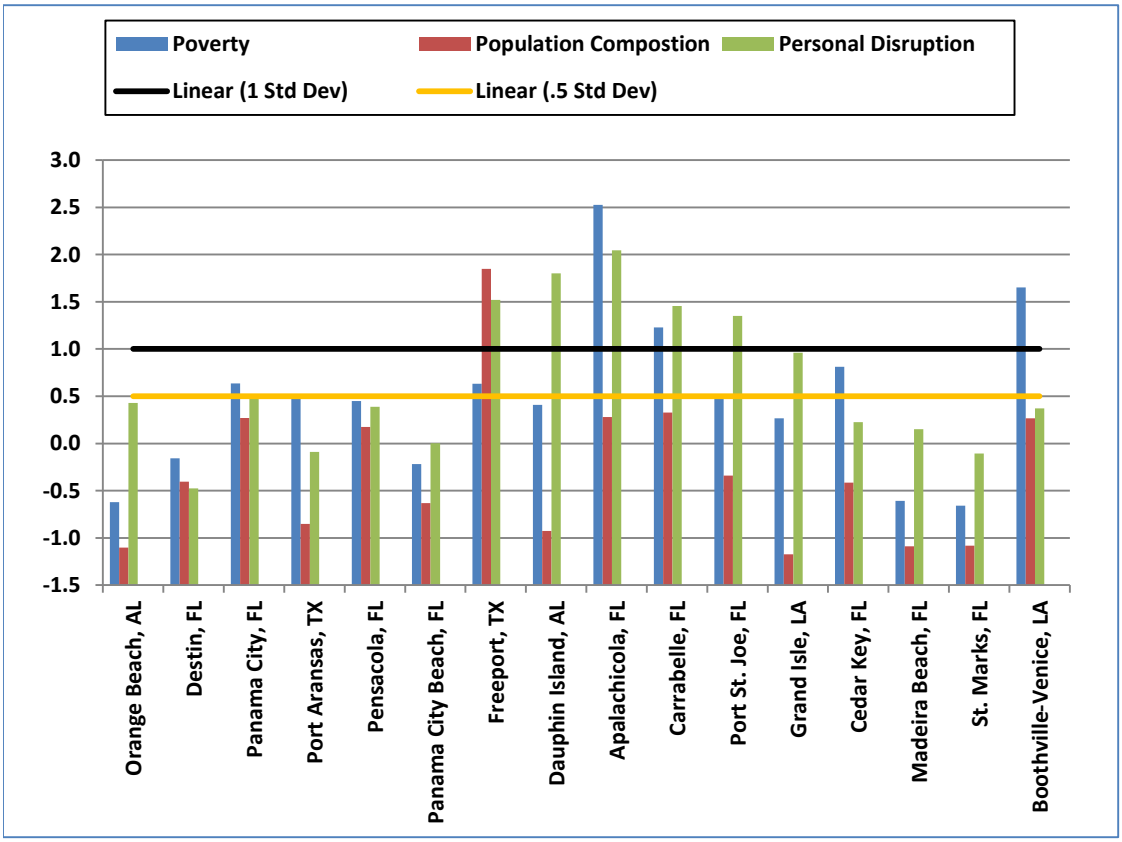

Figure 3.4.2. Social vulnerability indices for recreational fishing communities. Source: SERO, Social indicators database (2012).

People in these communities may be affected by fishing regulations in two ways: participation and employment. Although these communities may have the greatest potential

for EJ concerns, no data are available on the race and income status for those involved in the local fishing industry (employment), or for their dependence on gag grouper or black grouper specifically (participation). There are no known claims for customary usage or subsistence consumption of gag or black grouper by any Gulf of Mexico population including tribes or indigenous groups. Although no EJ issues have been identified, the absence of potential EJ concerns cannot be assumed.

The current preferred alternatives would increase the recreational minimum size limit for gag and black grouper and would eliminate the recreational fixed closed season for gag. The effects resulting from these actions are addressed in Sections 4.1.4, 4.2.4, and 4.3.4.

3.5 Description of the Administrative Environment

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 exclusive economic zone (EEZ). The EEZ is defined as an area extending 200 nautical miles from the seaward boundary of each of the coastal states. The Magnuson-Stevens Act also claims authority over U.S. anadromous species and continental shelf resources that occur beyond the EEZ.

Responsibility for federal fishery management decision-making is divided between the Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring management measures are consistent with the Magnuson-Stevens Act and with other applicable laws summarized in Section 10. In most cases, the Secretary has delegated this authority to NMFS.

The Council is responsible for fishery resources in federal waters of the Gulf. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the states of Florida and Texas, and the three-mile seaward boundary of the states of Alabama, Mississippi, and Louisiana. The length of the Gulf coastline is approximately 1,631 miles. Florida has the longest coastline of 770 miles along its Gulf coast, followed by Louisiana (397 miles), Texas (361 miles), Alabama (53 miles), and Mississippi (44 miles).

The Council consists of seventeen voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NMFS. The public is also involved in the fishery management process through participation on advisory panels and through publically open Council meetings, with some exceptions for discussing internal administrative matters. The regulatory process is also in

accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

Regulations contained within FMPs are enforced through actions of the NOAA's Office of Law Enforcement, the U.S. Coast Guard, and various state authorities. To better coordinate enforcement activities, federal and state enforcement agencies have developed cooperative agreements to enforce the Magnuson-Stevens Act. These activities are being coordinated by the Council's Law Enforcement Advisory Panel and the Gulf States Marine Fisheries Commission's Law Enforcement Committee have developed a two year "Gulf of Mexico Cooperative Law Enforcement Strategic Plan – 2011 - 2012."

State Fishery Management

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 state governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective state fisheries. Each of the five Gulf states exercises legislative and regulatory authority over their states' natural resources through discrete administrative units. Although each agency is the primary administrative body with respect to the states' natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources. A more detailed description of each state's primary regulatory agency for marine resources is provided in Amendment 22 (GMFMC 2004b).

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action 1 - Gag Recreational Minimum Size Limit

Alternative 1. (**No Action)** The recreational minimum size limit for gag remains at 22 inches total length (TL).

Preferred Alternative 2. Set the recreational minimum size limit for gag at 24 inches TL.

4.1.1 Direct and Indirect Effects on the Physical Environment

With respect to **Action 1**, fishery management actions that affect the physical environment mostly relate to the interactions of fishing with bottom habitat, either through gear impacts to bottom habitat or through the incidental harvest of bottom habitat as described in Section 3.1.1. Most gag are caught with hook-and-line fishing gear, although some spearfishing does occur. Fishing gear can damage or disturb bottom structures and occasionally incidentally harvest such habitat. The degree a habitat is affected by fishing gear depends largely on the vulnerability of the affected habitat to disturbance, and on the rate that the habitat can recover from disturbance (Barnette 2001). For example, the complex structure and vertical growth pattern of coral reef species makes reef habitat more vulnerable to adverse impacts from fishing gear and slower to recover from such impacts than is sand and mud bottom habitat (Barnette 2001).

In general, gag eggs and larvae are pelagic. Juvenile gag are found in seagrass beds and oyster shell reefs while adult gag primarily occur over mid-to-high relief natural reef habitat (GMFMC 2003a). Adult gag are associated with hard bottom substrates, including offshore reefs and wrecks, coral and live bottom, and depressions and ledges. Spawning adults form aggregations in depths of 50 to 120 meters (m), with the densest aggregations occurring around the Big Bend area of Florida. Females undergo a migration from shallower waters to the deeper waters where spawning occurs, while males generally stay at the same depths where spawning occurs (Koenig 1996).

Longlines

Longline gear is deployed over hard bottom habitats using weights to keep the gear in direct contact with the bottom. Its potential for adverse impact is dependent on the type of habitat it is set on, the presence or absence of currents and the behavior of fish after being hooked. In addition, this gear upon retrieval can abrade, snag, and dislodge smaller rocks, corals, and sessile invertebrates (Bohnsack in Hamilton, 2000; Barnette 2001). Direct underwater observations of longline gear in the Pacific halibut fishery by High (1998) noted that the gear could sweep across the bottom. Some halibut were observed pulling portions of longlines 15 to 20 feet over the bottom. Although the gear was observed in contact with or snagged on a variety of objects including coral, sturdy flexible corals usually appeared unharmed while hard corals often had portions broken off. However, in another study that directly observed deployed longline gear (Atlantic tilefish fishery) found no evidence that the gear shifted significantly, even when set in currents. This was attributed to anchors set at either end of the longline as well as sash weights

along the line to prevent movement (Grimes et al. 1982). Based on the direct observations, it is logical to assume that bottom longline gear would have a minor impact on sandy or muddy habitat areas. However, due to the vertical relief that hardbottom and coral reef habitats provide, it would be expected that bottom longline gear may become entangled, resulting in potential negative impacts to habitat (Barnette 2001).

Vertical lines

Concentrations of many managed reef fish species are higher on hard bottom areas than on sand or mud bottoms, thus vertical line gear fishing generally occurs over hard bottom areas (GMFMC 2004a). Vertical lines include multi-hook lines known as bandit gear, handlines, and rod-and-reels. Vertical-line gear is less likely to contact the bottom than longlines, but still has the potential to snag and entangle bottom structures and cause tear-offs or abrasions (Barnette 2001). In using bandit gear, a weighted line is lowered to the bottom, and then the lead is raised slightly off the bottom (Siebenaler and Brady 1952). The gear is in direct contact with the bottom for only a short period of time. Barnette (2001) suggests that physical impacts may include entanglement and minor degradation of benthic species from line abrasion and the use of weights (sinkers). Commercial or recreational fishing with rod-and-reel and handlines also puts gear on the bottom. The terminal part of the gear is either lifted off the bottom like fishing with bandit gear, or left contacting the bottom. Sometimes the fishing line can become entangled on coral and hard bottom outcroppings. The subsequent algal growth can foul and eventually kill the underlying coral (Barnette 2001). Researchers conducting studies in the restricted fishing area at Madison-Swanson reported seeing lost fishing line on the bottom, much of which appeared to be fairly old and covered with growth (personal communication, Andrew David), a clear indication that bottom fishing has had an impact on the physical environment prior to fishing being prohibited in the area (GMFMC 2003b). The National Fish and Wildlife Foundation, in issuing grants to remove marine debris, established monofilament fishing line is a priority marine debris issue.

Anchor damage is also associated with vertical-line fishing vessels, particularly by the recreational sector where fishermen may repeatedly visit well marked fishing locations. Bohnsack and Hamilton (2000) showed that “favorite” fishing areas such as reefs are targeted and revisited multiple times, particularly with the advent of global positioning technology. The cumulative effects of repeated anchoring could damage the hard bottom areas where fishing for grouper occurs.

Spear and Powerhead

Spearguns and slings are used in both commercial and recreational grouper fishing but are a relatively minor component of both. Barnette (2001) cited a study by Gomez (1987) that concluded that spearfishing on reef habitat may result in some coral breakage, but damage is probably negligible. In addition, there could be some impacts from divers touching coral with hands or from resuspension of sediment by fins (Barnette 2001). Such impacts should be negligible to non-existent for well-trained and experienced spearfishermen who stay in the water column and avoid contact with the bottom.

Indirectly, size influence the management measures needed, including closed seasons and seasonally closed areas. These actions affect the amount of time that fishing gear can interact with the physical environment. Fishing line can get entangled on bottom structures and lead to local fouling of areas in some situations. In this respect, **Alternative 1**, the no action alternative, will have less indirect impact to the physical environment than **Preferred Alternative 2.** These impacts would be from the expected increase in the amount of time to harvest the recreational gag quota, and conversely, increase gear interactions with the physical environment. In combination with which season closure is selected by the Council, **Alternative 1**, is expected to result in a 220-239 day fishing season while **Preferred Alternative 2** is expected to result in 306-343 fishing days. These impacts are expected to be minor.

Alternative 1 (no action), would maintain the current 22-inch TL size limit and is not expected to affect recreational fishing for gag and would therefore not be expected to result in effects to the physical environment. Although the size limit increase to 24 inches TL in **Preferred Alternative 2** may have indirect effects on the physical environment but allowing a longer season, it is not expected to alter the overall execution of the reef fish fishery and therefore is not be expected to have any significant effects on the physical environment.

4.1.2 Direct and Indirect Effects on the Biological/Ecological Environment

Alternative 1, the no action alternative, is expected to have the greatest negative impact on the gag stock. It will allow the recreational fishery to operate year round, except for a fixed February-March shallow-water grouper closed season. **Preferred Alternative 2** increases the recreational minimum size limit from 22 inches to 24 inches and would be expected to provide greater benefits to the gag stock as more mature individuals would reach sexual maturity. At 22-24 inches TL it is estimated that 50% of the female population would be sexually mature and capable of spawning (SEDAR 10 2006, SEDAR 33 2014a). **Preferred Alternative 2** would be expected to provide more gag the opportunity to spawn than **Alternative 1**, and provide a greater positive effect to the population.

The Council and its Reef Fish Advisory Panel have stated concerns about bycatch mortality of gag if the minimum size limit is increased. There were also concerns about whether or not the minimum size limit would sufficiently slow the rate of harvest and increase gag bycatch. To address these concerns, the decision model (Appendix B) was used to evaluate how the rate of harvest and dead discards would change with increases to the minimum size limit. However, **Preferred Alternative 2** is not expected to alter the overall execution of the fishery and therefore is not expected to have any significant effects on the biological environment.

4.1.3 Direct and Indirect Effects on the Economic Environment

This action considers increases in the recreational size limit for gag. **Preferred Alternative 2** would increase the size limit to 24 inches TL. **Alternative 1** (no action), which would maintain the current 22-inch minimum size limit, is not expected to affect recreational fishing for gag and would therefore not be expected to result in economic effects. Economic effects, measured in changes in consumer surplus for the recreational sector were derived from a recreational decision

tool developed by SERO (2015). As discussed in Section 3.3.2, changes in consumer surplus are determined based on a consumer surplus of $103 (2014 dollars) per gag. Table 4.1.3.1 provides estimated recreational gag harvests for **Alternative 1** and **Preferred Alternative 2** and associated annual changes in consumer surplus for **Preferred Alternative 2** relative to the status quo in the first year the action is fully implemented[6]. For subsequent years, a qualitative discussion of the economic effects expected to result from the management alternatives is provided.

This analysis does not include estimates for changes in producer surplus because it is assumed that the size limit adjustment under consideration would not affect the number of for-hire trips. For-hire trips are expected to remain the same because gag are typically harvested with other reef fish (including other groupers). Therefore, although size limit changes could be expected to change the catch composition for recreational anglers on for-hire trips, the number of for-hire trips is expected to remain unaffected. Should this assumption not hold and anglers choose to cancel or refrain from booking trips because either the gag season is closed or they have a lower probability of harvesting a gag, this could result in a loss in producer surplus; however, given the high uncertainty associated with changes in effort, it is not possible to quantify this potential loss. It is also noted that the decision tool used to estimate changes in consumer surplus to the recreational sector does not account for potential changes in the quality of recreational trips due to size limit modifications.

Table 4.1.3.1. Estimated landings and decreases in number of fish harvested and consumer surplus (by mode) relative to Alternative 1 (no action). Landings and consumer surplus are expressed in number of fish and 2014 dollars, respectively.

Fishing Mode	Estimated Landings (Number of fish)		Decrease relative to Alternative 1	
	Alternative 1 (22-inch)	Preferred Alternative 2 (24-inch)	Number of fish	Consumer Surplus
Headboat	5,185	4,193	992	$102,175
Charter	22,956	18,290	4,665	$480,524
Private	177,055	141,447	35,608	$3,667,616
Total	205,196	163,931	41,265	$4,250,315

Source: SERO - Gag Decision Tool 2015

Relative to **Alternative 1** (no action), a greater size limit would be expected to result in a reduced retained catch rate. Therefore, without adjustments to the season length, **Preferred Alternative 2**, which would increase the size limit from 22 to 24 inches TL, would be expected to result in lower gag recreational harvests. Based on the recreational gag decision tool, **Preferred Alternative 2** would be expected to result in a 20.1 % decrease in recreational gag harvests in the first year this action is fully implemented relative to the status quo. The associated loss in consumer surplus, derived by multiplying the decrease in gag harvests (measured in number of fish) by the estimated consumer surplus per gag, is estimated at approximately $4.25 million. Because neither the ACL nor the ACT is expected to be reached

[6] The current expectation is that this framework action will be fully implemented in 2016.

under the status quo season length, the estimated change in consumer surplus from a size limit increase would be the same whether or not accountability measures are in place for gag. Although the uncertainty associated with the decision tool increases as projections are made further out into the future, a greater size limit would be expected to continue to result in comparable decreases in harvests and in consumer surplus of similar magnitudes in subsequent years. A discussion of the combined economic effects expected to result from modifications to the recreational season and to the size limit is provided in Section 4.3.3.

4.1.4 Direct and Indirect to the Social Environment

Usually, the minimum size limit for a stock is changed to address biological goals, such as decreasing dead discards. In this case, the recreational minimum size limit for gag would be modified to make it consistent with the South Atlantic Council's minimum size limit, which is larger than the current minimum size limit for gag in the Gulf. Increasing the minimum size limit would also allow for the fishing season to be extended (Action 3). The effects of increasing the minimum size limit in terms of extending the recreational fishing season are provided in Section 4.3.4.

Additional effects would not be expected from retaining the current 22-inch TL minimum size limit for gag (**Alternative 1**). However, this alternative would allow different minimum size limits to remain in the waters surrounding the Florida Keys, which is part of both the Gulf and South Atlantic Council jurisdictions. In this area, it can be confusing for anglers to comply with the appropriate minimum size limit, which is 22 inches TL in federal waters of the Gulf Council's jurisdiction, but 24 inches TL both in state waters of the Florida Keys and in federal waters of the South Atlantic Council's jurisdiction.

Monroe County, which includes the Florida Keys, is the only area for which the inconsistent regulations between Councils would affect anglers. Very little gag is harvested by recreational anglers in Monroe County (Table 1.1.1). For anglers who may land gag in Monroe County, some positive effects would be expected under **Preferred Alternative 2**, which would reconcile the different minimum size limits by increasing the Gulf minimum size limit to 24 inches TL. Anglers who are confused as to where each size limit applies would benefit by establishing a consistent minimum size limit with the South Atlantic Council. Some negative effects could potentially occur if the increase in the size limit restricts anglers in the Gulf Council's jurisdiction of Monroe County from being able to retain a legal size gag.

Outside of the state and federal waters surrounding Monroe County, where inconsistent minimum size limits do not exist for gag, **Preferred Alternative 2** would be expected to result in some negative direct effects for anglers. In recent years, the recreational sector has not caught its quota (Table 1.3.1). Gag is a very popular recreational target species for the west coast of Florida, especially from Levy to Collier County (Table 1.1.1). That anglers are not landing their allotted quota could be due to numerous factors including restrictive regulations or decreasing stock availability. Action 3 evaluates extending the recreational fishing season to provide more fishing opportunities for anglers to catch the quota. Assuming that fishing activity and effort remain the same, increasing the minimum size limit by 2 inches TL would be expected to result in less of the quota being caught than under **Alternative 1**, as anglers who catch a gag between

22 inches TL and 24 inches TL would no longer be able to retain the fish. Thus, for the majority of Gulf anglers who target gag, **Preferred Alternative 2** would be expected to result in greater negative effects than **Alternative 1**. These effects could be mitigated by enabling a longer fishing season (Action 3).

4.1.5 Direct and Indirect Effects on the Administrative Environment

The alternatives in Action 1 are expected to have minimal impacts to the administrative environment compared to no action. **Alternative 1**, which maintains the 22-inch TL minimum size limit, will continue to create enforcement complications in the south Florida area due to having a different size limit in the South Atlantic and in Florida state waters off Monroe County. **Preferred Alternative 2**, which adopts a minimum size limit that is consistent with the South Atlantic size limit will ease enforcement in the south Florida area, but may complicate enforcement in the rest of Gulf where the state minimum size limit is 22 inches TL (unless the states adopt the same change in size limit). However, enforcement already addresses differing size limits between state and federal waters for other species such as red snapper, so any additional impacts on the administrative environment are expected to be minimal other than the effort it would take to change the regulations.

4.2 Action 2 – Black Grouper Recreational Minimum Size Limit

Alternative 1. No Action. The recreational minimum size limit for black grouper remains at 22 inches TL.

Preferred Alternative 2. Set the recreational minimum size limit for black grouper at 24 inches TL.

4.2.1 Direct and Indirect Effects on the Physical Environment

With respect to **Action 2**, fishery management actions that affect the physical environment mostly relate to the interactions of fishing with bottom habitat, either through gear impacts to bottom habitat or through the incidental harvest of bottom habitat as described in Section 3.1.1. The degree a habitat is affected by fishing gear depends largely on the vulnerability of the affected habitat to disturbance, and on the rate that the habitat can recover from disturbance (Barnette 2001). For example, the complex structure and vertical growth pattern of coral reef species makes reef habitat more vulnerable to adverse impacts from fishing gear and slower to recover from such impacts than is sand and mud bottom habitat (Barnette 2001). Juvenile black grouper are found were shallow rocky reef habitats which had either high vertical relief with crevices, caves, or small dispersed rocks while adult black grouper primarily caught along high relief areas in deeper waters.

In general, black grouper eggs and larvae are pelagic. Juvenile black grouper are found were shallow rocky reef habitats which had either high vertical relief with crevices, caves, or small

dispersed rocks while adult black grouper primarily caught along high relief areas in deeper waters.

The primary effects of the recreational black grouper fishery on the physical environment generally result from fishing gear interactions with the sea floor. Most black grouper are caught with hook-and-line fishing gear, although some spearfishing does occur. Fishing gear can damage or disturb bottom structures and occasionally incidentally harvest such habitat. Sections 3.1 describes the physical environment and habitat use by Black groupers. In general, eggs and larvae are pelagic. Virtually no information on the life history and distribution of young juveniles (age 0-1) black grouper is available. Black grouper spawning is presumed to occur, in the habitats in Florida (particularly in the Florida Keys) where these fish occur (presumably rocky habitats not presently sampled by the fishery independent program in Florida).

Alternative 1 (no action), would maintain the current 22-inch TL size limit and is not expected to affect recreational fishing for black grouper and would therefore not be expected to result in effects to the physical environment. The size limit increase to 24 inches TL in **Preferred Alternative 2** is not expected to alter the overall execution of the reef fish fishery and therefore is not expected to have any substantial effects on the physical environment.

4.2.2 Direct and Indirect Effects on the Biological/Ecological Environment

Black grouper are rarely caught in the Gulf north of Monroe County (although gag are sometimes misidentified as black grouper) (Table 4.2.4.1). Consequently, any biological/ecological effects outside of the waters off Monroe County would be insignificant.

Alternative 1, no action, leaves the black grouper recreational minimum size limit at 22 inches TL which is inconsistent with the South Atlantic minimum size limit which was set to 24 inches TL for both the recreational and commercial sector in 1999 (SAFMC 1999). However, it would be consistent with the commercial minimum size limit of 22 inches TL in the Gulf. **Alternative 1**, the no action alternative, is expected to allow the recreational fishery to operate year round, except for a fixed February-March shallow-water grouper closed season and would not be expected to have a greater negative impact on the black grouper stock as compared to **Preferred Alternative 2**.

Preferred Alternative 2 sets the black grouper recreational minimum size limit at 24 inches TL, which is consistent with the South Atlantic's minimum size limit and with the commercial minimum size limit in the Gulf. Florida (north of Monroe County), Alabama, Mississippi, and Louisiana have a 22-inch TL recreational minimum size limit in their state waters, while Texas has no size limit (Table 2.2.2). Black grouper reach 22 inches TL at just under 3 years and take about half a year to grow to 24 inches TL (Table 2.2.1). Increasing the minimum size limit will reduce the retained catch rate, but since the season is already open year-round (except for a February – March closure in waters less than 20 fathoms), there will be no effect on season length. Increasing the minimum size limit will increase regulatory discards and discard mortality. Given the speed at which black grouper grow from 22 inches to 24 inches, and a relatively low release mortality rate in shallow water, any increase in discard mortality from

increasing the size limit should be fairly minor. However, **Preferred Alternative 2** is also expected to result in more fish being discarded and increase the number of dead discards. No measures are proposed in this amendment to directly reduce the bycatch of other reef fish species. An increase in black grouper minimum size limit would be expected to increase recreational discards of black grouper. The magnitude of these effects would depend on the length of the recreational fishing season, and the amount of effort shifting that occurs.

Alternative 1 (no action), would maintain the current 22-inch TL size limit and is not expected to affect recreational fishing for black grouper and would therefore not be expected to result in effects to the biological environment. The size limit increase to 24 inches TL in **Preferred Alternative 2,** is not expected to alter the overall execution of the reef fish fishery and therefore is not expected to have any substantial effects on the biological environment.

4.2.3 Direct and Indirect Effects on the Economic Environment

This action considers increases in the recreational minimum size limit for black grouper. **Preferred Alternative 2** would increase the size limit to 24 inches TL. **Alternative 1** (no action), which would maintain the current 22-inch minimum size limit, is not expected to affect recreational fishing for black grouper and would therefore not be expected to result in economic effects. **Preferred Alternative 2** would increase the size limit for black grouper to be consistent with the size limit in the South Atlantic and with the size limit for gag in the Gulf of Mexico if the Council elects to set a 24-inch size limit in Action 1. An increase in the Gulf black grouper minimum size limit would be expected to result in a reduced retained catch rate, thereby resulting in adverse economic effects. By maintaining consistency across Councils and between gag and black grouper in the Gulf, **Preferred Alternative 2** would also be expected to yield economic benefits. Due to the negligible number of sampled black grouper trips and limited black grouper recreational landings in the Gulf of Mexico (M. Larkin, pers. comm. 7/21/2015), potential net economic effects that would result from **Preferred Alternative 2** are expected to be minimal.

4.2.4 Direct and Indirect Effects on the Social Environment

Usually, the minimum size limit for a stock is changed to address biological goals, such as decreasing dead discards. In this case, the recreational minimum size limit for black grouper would be modified to make it consistent with the South Atlantic Council's minimum size limit, which is larger than the current minimum size limit for black grouper in the Gulf.

Additional effects would not be expected from retaining the current 22-inch TL minimum size limit for black grouper (**Alternative 1**). However, this alternative would allow different minimum size limits to remain for the waters surrounding the Florida Keys, which is part of both the Gulf and South Atlantic Council jurisdictions. In this area, it can be confusing for anglers to comply with the appropriate minimum size limit, which is 22 inches TL in federal waters of the Gulf Council's jurisdiction, but 24 inches TL both in state waters of the Florida Keys and in federal waters of the South Atlantic Council's jurisdiction.

State and federal waters surrounding Monroe County, which includes the Florida Keys, is the only area for which the inconsistent regulations between Councils would affect anglers. In contrast with Gulf landings of gag (Action 1), more black grouper is landed in Monroe County than from the rest of the Gulf combined (Table 1.1.2), although nearly all of these landings count towards the South Atlantic Council's ACL for black grouper. For anglers fishing for black grouper from Monroe County, some positive effects would be expected under **Preferred Alternative 2**, which would reconcile the different minimum size limits by increasing the Gulf minimum size limit to 24 inches TL. Anglers who are confused as to where each size limit applies would benefit by establishing a consistent minimum size limit with the South Atlantic Council. Some negative effects could potentially occur if the increase in the size limit restricts anglers in the Gulf Council's jurisdiction of Monroe County from being able to retain a legal size black grouper.

As stated, very little black grouper is landed outside of Monroe County. Thus, the effects from increasing the minimum size limit for black grouper (**Preferred Alternative 2**) would be expected to be minimal for anglers who land black grouper outside of Monroe County.

4.2.5 Direct and Indirect Effects on the Administrative Environment

The alternatives in Action 2 are expected to have minimal impacts to the administrative environment compared to no action. **Alternative 1**, which maintains the 22-inch TL minimum size limit, will continue to create enforcement complications in the south Florida area due to having a different size limit in the South Atlantic and in Florida state waters off Monroe County. **Preferred Alternative 2**, which adopts a minimum size limit that is consistent with the South Atlantic size limit will ease enforcement in the south Florida area, but may complicate enforcement in the rest of Gulf where the state minimum size limit is 22 inches TL (unless the states adopt the same change in size limit). However, enforcement already addresses differing size limits between state and federal waters for other species such as red snapper, so any additional impacts on the administrative environment are expected to be minimal other than the effort it would take to change the regulations.

4.3 Action 3 – Modifications to the Recreational Gag Fishing Season

Alternative 1: (No action) The recreational gag season will remain July 1 through December 2 (155 days) unless shortened due to a projection that the annual catch level (ACL) will be reached sooner.

Preferred Alternative 2: Remove the December 3-31 fixed closed season. The recreational gag season will remain open through the end of the year or until a projection that the ACL will be reached sooner[7]. Note Alternative 3, 4 or 5 may also be selected in combination with this alternative.

Alternative 3: Remove the January through June gag seasonal closure. Begin the season on January 1 and close when the recreational ACL is projected to be reached[1].

> **Option 3a**. Maintain the February 1 through March 31 closed season on recreational harvest of gag seaward of the 20-fathom boundary. Fishing for gag will be allowed shoreward of the boundary during those months.
>
> **Option 3b**. Remove the February 1 through March 31 closed season on recreational harvest of gag seaward of the 20-fathom boundary. Fishing for gag will be allowed in all federal waters during those months. The 20-fathom closure will continue to be in effect for other shallow-water grouper.
>
> **Option 3c**. Close the gag recreational season from February 1 through March 31 in all Federal waters.

Alternative 4: Remove the January through June gag seasonal closure. Set an opening date for the recreational gag season such that the ACL is projected to be reached on or after December 31 (based on the 2016 ACL).

> **Option 4a**. Maintain the February 1 through March 31 closed season on recreational harvest of gag seaward of the 20-fathom boundary. Fishing for gag will be allowed shoreward of the boundary during those months if gag season is open.
>
> **Option 4b**. Remove the February 1 through March 31 closed season on recreational harvest of gag seaward of the 20-fathom boundary. Fishing for gag will be allowed in all federal waters during those months if gag season is open. The 20-fathom closure will continue to be in effect for other shallow-water grouper.
>
> **Option 4c**. Open January 1 through 31, close February 1 through March 31 to recreational harvest of gag in all federal waters, and re-open on the date such that the 2016 ACL is projected to be reached on or after December 31.

[7] The recreational season closing date for gag is normally based on when the date when the ACL is projected to be reached. However, under the accountability measures for gag, if the recreational landings for gag exceed the ACL, then in the following year the season will close based on when the ACT is projected to be reached.

Preferred Alternative 5: Remove the June 1 through 30 portion of the recreational fixed closed season on gag. Begin the open season on June 1, and close when the recreational ACL is projected to be reached[8].

4.3.1 Direct and Indirect Effects on the Physical Environment

The primary effects of recreational grouper fishing on the physical environment result from fishing gear interactions with the sea floor. Most grouper are caught with hook-and-line fishing gear, although some spearfishing does occur. Fishing gear can damage or disturb bottom structures and occasionally incidentally harvest such habitat. However, Barnette (2001) indicated the effects of these gears on the physical environment are much less than other gear types.

The degree a habitat is affected by fishing gear depends largely on the vulnerability of the affected habitat to disturbance and on the rate that the habitat can recover from disturbance (Barnette 2001). For example, the complex structure and vertical growth pattern of reef building coral species makes reef habitat more vulnerable to adverse impacts from fishing gear and slower to recover from such impacts than sand and mud bottom habitat (Barnette 2001). Juvenile gag are found in seagrass beds and oyster shell reefs, whereas adult gag primarily occur over mid-to-high relief natural reef habitat. Red grouper are also associated with hard bottom habitat, but tend to prefer lower relief habitat than gag. Adult black grouper are found over wrecks and rocky coral reefs. Scamp are associated with ledges and high relief hard bottoms. For yellowfin and yellowmouth grouper, information on habitat association is sparse, although juvenile yellowfin grouper have been documented in inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems (GMFMC 1998).

The alternatives in this action affect the amount of time and time of year that recreational fishermen can harvest gag from federal waters of the Gulf.

Alternative 1 (no action) retains the existing 155-day recreational gag season. Since the number of fishing days would not change from 2014, impacts from possible interaction between fishing gear and the bottom habitat as discussed above are not changed. **Alternative 1**, would also maintain the fixed closed season from February 1 through March 31 seaward of the 20-fathom boundary and would be expected to result in less negative impacts to the physical environment compared to **Preferred Alternatives 2 and 5**, and **Alternatives 3** and **4**.

Preferred Alternative 2 removes the December 3 closure date and **Preferred Alternative 5** removes the closure from June 1 through June 30, resulting in a 214 day recreational season. Longer seasons imply a greater potential for gear interaction and negative physical impacts from the types of disturbances discussed above. There is overlap in the range of season lengths, but a clear progression exists in season length from **Preferred Alternatives 2** and **5** to **Alternative 3** and **4. Alternatives 3** and **4** would remove the January through June recreational season closure.

[88] The recreational season closing date for gag is normally based on when the date when the ACL is projected to be reached. However, under the accountability measures for gag, if the recreational landings for gag exceed the ACL, then in the following year the season will close based on when the ACT is projected to be reached.

Alternative 3 would open the season on January 1 and close the season when the ACL is projected to be reached. **Alternative 4** sets the opening date by back calculating the projected season length from December 31. **Option 3a** and **Option 4a** maintain the February 1 through March 31 closure beyond the 20-fathom boundary while allowing recreational fishing for gag inshore of 20 fathoms (if the season is open during that period). **Options 3b** and **4b** remove the 20-fathom boundary closure and allow fishing for gag at any depth (if the season is open during that period). **Option 3c and 4c** close the harvest of gag in all federal waters from February 1 through March 31. The numbers of days in the recreational gag season for **Action 1**, **Preferred Alternative 2**, and the **Action 3** alternatives with the various options are described (Tables 2.3.1 and 2.3.2.) in conjunction with **Action 3**, **Preferred Alternative 2. Option 3a or 4a** would result in the longest season (estimated at 343 days or 329 days) under all combinations of size limits, and would be expected to result in the most gear interaction and negative physical environment impacts, while **Options 3c** and **4c** (estimated at 306 days) would be expected to result in the shorter season and the least gear interactions, and less negative physical environment impacts than **Options 3a**, **3b**, **3c, 4a**, and **4b**. **Alternative 4** with a 22 inch TL size limit would result in the same number of days (estimated at 218 days) for all options.

Preferred Alternatives 2 and 5 may have indirect effects on the physical environment by allowing a longer season, however, it is not expected to alter the overall execution of the reef fish fishery and therefore is not be expected to have any substantial effects on the physical environment.

4.3.2 Direct and Indirect Effects on the Biological/Ecological Environment

Alternative 1 (no action) retains the existing 155 day recreational gag season from July 1 through December 2. **Preferred Alternative 2** removes the December 3 closure date and **Preferred Alternative 5** removes the closure from June 1 through June 30, resulting in a 214 day recreational season (June 1 – December 31) unless closed earlier due to the ACL being reached. Longer seasons imply a greater potential for increased bycatch and discards. **Alternatives 3** and **4,** increase the recreational fishing season to an estimated 220-343 fishing days depending on the size limit, respectively. Although these alternatives will allow an increase in harvest relative to **Alternative 1**, they will still have positive biological effects on the gag stock by keeping harvest within the annual catch limit (ACL).

Alternatives 3 and **4** would remove the January through June recreational season closure. **Alternative 3** would open the season on January 1 and close the season when the ACL is projected to be reached. **Alternative 4** sets the opening date by back calculating the projected season length from December 31. **Option 3a** and **Option 4a** maintain the February 1 through March 31 closure beyond the 20-fathom boundary while allowing recreational fishing for gag inshore of 20 fathoms (if the season is open during that period). **Options 3b** and **4b** remove the 20-fathom boundary closure and allow fishing for gag at any depth (if the season is open during that period). **Option 3c and 4c** close the harvest of gag in all federal waters from February 1 through March 31. The numbers of days in the recreational gag season for **Action 1**, **Preferred Alternative 2**, and the **Action 3** alternatives with the various options are described (Tables 2.3.1 and 2.3.2.) in conjunction with **Action 3**, **Preferred Alternative 2. Option 3a or 4a** would result in the longest season (estimated at 343 days or 329 days) under all combinations of size

limits, and would be expected to result in the most gear interaction and negative biological impacts, while **Options 3c** and **4c** (estimated at 306 days) would be expected to result in the shorter season and the least gear interactions, and less negative biological impacts than **Options 3a**, **3b**, **4a**, and **4b**. **Alternative 4** with a 22 inch TL size limit would result in the same number of days (estimated at 218 days) for all options.

Fishermen targeting gag may have an incidental bycatch of other species. Hierarchical cluster analysis of recreational landings show that gag catches are associated most closely with red grouper, but also other groupers as well as other reef fish, particularly gray (mangrove) snapper (Farmer et al. 2010). Thus, a closure for all shallow-water grouper may be effective in reducing bycatch of gag in areas where red grouper are caught, but bycatch of gag is likely to continue in areas where other reef fish are caught. Among the species caught in association with gag to a lesser extent, gray triggerfish and greater amberjack are currently classified as overfished and is in a stock rebuilding plan. Incidental bycatch by fishermen targeting gag could indirectly have a negative impact on the gray triggerfish and greater amberjack stock rebuilding. Gray triggerfish and greater amberjack currently have a fixed closed recreational season June 1 through July 31.

Preferred Alternatives 2 and 5 may have indirect effects on the biological environment by allowing a longer season, however, it is not expected to alter the overall execution of the reef fish fishery and therefore is not expected to have any substantial effects on the biological environment.

4.3.3 Direct and Indirect Effects on the Economic Environment

This action considers alternatives to the current July 1 through December 2 annual gag recreational fishing season. **Alternative 2** would allow, if warranted, the recreational fishing season to be extended beyond December 2 by eliminating the December 3 to 31 fixed closed season. **Alternatives 3** and **4** would eliminate the January through June seasonal closure. **Alternative 3** would begin the season January 1 and close when the ACL is projected to be met. **Alternative 4** would set an opening date such that the ACL is projected to be met on or after December 31. For **Alternatives 3** and **4**, **Options a, b,** and **c** would maintain (**Option a**) or eliminate (**Option b**) the 20-fathom closure or prohibit fishing in the EEZ (**Option c in Alternatives 3 and 4**) between February 1 and March 31. **Preferred Alternative 5** would eliminate the June 1 through 30 fixed close season and open the season on June 1. The fishing season would be closed when the recreational ACL is projected to be met.

Alternative 1 (no action), which would maintain the July 1 to December 2 annual gag recreational fishing season is not expected to affect recreational fishing for gag and would therefore not be expected to result in economic effects. **Preferred Alternative 2** does not propose a specific recreational fishing season but, within the limits determined by the ACL, would allow the fishing seasons proposed in **Preferred Alternative 5** and **Alternatives 3** and **4** to run beyond December 2. Therefore, **Preferred Alternative 2** would be expected to result in positive economic effects if it is implemented in conjunction with an alternative that would set a recreational fishing season running past December 2, e.g., **Preferred Alternative 5** and all options under **Alternative 4.** Economic effects, measured in changes in consumer surplus for the recreational sector were derived from a recreational decision tool developed by SERO

(2015). As discussed in Section 3.3.2, changes in consumer surplus are determined based on a consumer surplus (CS) (2014 dollars) per gag. For **Alternatives 3-4** and **Preferred Alternative 5**, Table 4.3.3.1 provides annual changes in CS for estimated gag recreational fishing seasons in the first year the action is fully implemented[9], assuming accountability measures are in place and an in-season closure will occur when the ACT is projected to be reached. Table 4.3.3.2 provides the same information, assuming accountability measures are not in place and an in-season closure will occur when the ACL is projected to be reached. For subsequent years, a qualitative discussion of the economic effects expected to result from the management alternatives is provided.

Table 4.3.3.1 Estimated season length and changes relative to the status quo in CS for alternative gag recreational fishing seasons assuming accountability measures are in effect* and **Preferred Alternative 2** is implemented. Season length in days; CS in $1,000 (2014 dollars).

	Season Length (days)		Changes in Consumer Surplus ($1,000)	
	22-inch	24-inch	22-inch	24-inch
Alternative 1	155		---	---
Alternative 3-a	227	306	$4,218	$3,974
Alternative 3-b	222	294	$4,112	$4,050
Alternative 3-c	181	275	$3,857	$3,954
Alternative 4-a	194	258	$3,790	$4,014
Alternative 4-b	194	258	$3,790	$4,014
Alternative 4-c	194	258	$3,790	$4,014
Preferred Alternative 5	189	214	$3,845	$883

Source: SERO - Gag Decision Tool 2015. *****When accountability measures are in effect due to a previous overage, in-season closures will be based on the ACT rather than the ACL.

[9] The current expectation is that this framework action will be fully implemented in 2016.

Table 4.3.3.2 Estimated season length and changes in CS for alternative gag recreational fishing seasons assuming accountability measures are not in effect* and **Preferred Alternative 2** is implemented. Season length in days; CS in $1,000 (2014 dollars).

	Season Length (days)		Changes in Consumer Surplus ($1,000)	
	22-inch	24-inch	22-inch	24-inch
Alternative 1	155		---	---
Alternative 3-a	239	343	$6,962	$7,064
Alternative 3-b	235	334	$7,086	$7,050
Alternative 3-c	220	306	$6,711	$6,534
Alternative 4-a	218	329	$6,865	$7,077
Alternative 4-b	218	316	$6,865	$7,064
Alternative 4-c	218	306	$6,865	$6,534
Preferred Alternative 5	214	214	$6,407	$883

Source: SERO - Gag Decision Tool 2015. *****When accountability measures are in effect due to a previous overage, in-season closures will be based on the ACT rather than the ACL.

The changes in CS expected to occur under each of the season alternatives would stem from changes in the temporal distribution of harvests and effort, and the total number of gag estimated to be harvested. It is noted that the decision tool used to estimate changes in CS to the recreational sector does not account for potential effort shifts during the open months. It is important to note that CS may increase or decrease relative to changes in season length, based on the temporal distribution of harvests, as well as the total amount harvested by the recreational sector. This is because the recreational decision tool developed by SERO (2015) estimates the number of fish harvested using heterogeneous wave-level daily catch rates and mean fish weights. CS, as estimated, is based only on the number of fish and not the size of fish, so the same number of pounds would be more valuable in a month with a low mean fish weight than with a high mean fish weight. Additionally, because the recreational decision tool simulates a quota closure in the day preceding the day on which an estimated overage would occur, the overall harvest is dependent on both the daily catch rate and the aggregate harvest through the estimated closure date. Relative to **Alternative 1** (no action), all options proposed in **Alternatives 3** to **4** and **Preferred Alternative 5** would be expected to result in positive economic effects, as measured by increases in consumer surplus. With a 22-inch minimum size limit, increases in CS in the first year this action is fully implemented range approximately from $3.79 million to $4.22 million (2014 dollars) if accountability measures are in effect (Table 4.3.3.1) and from $6.71 million to $7.09 million if accountability measures are not in effect (Table 4.3.3.2)**.** Increases in CS expected to result from **Preferred Alternative 5**, assuming **Preferred Alternative 2** is also implemented, are estimated at $6.4 million if accountability measures are not in place and $3.85 million if accountability measures are in place.

In addition to changes to the structure of the gag recreational fishing season, this framework action considers adjustments to the gag minimum size limit. The combined economic effects that would be expected to result from changes to the season structure and increases in the minimum size limit for gag are discussed in this section. As previously indicated, economic

effects expected to result from **Preferred Alternative 2** would stem from allowing recreational seasons proposed in **Preferred Alternative 5** and **Alternatives 3** and **4** to be extended beyond December 2. The combined effects that would be expected to result from the size limit increase proposed (Action 1) and adjustments to the fishing seasons (Action 3; **Alternatives 3-4** and **Preferred Alternative 5**) are presented in Table 4.3.3.1 and Table 4.3.3.2. In general, increasing the size limit would lengthen the fishing season by reducing the harvest rate. As discussed in this section, expected consumer surplus for the first year this action is fully implemented relative to the status quo, which was estimated using the recreational decision tool, could decrease or increase due to temporal variations in the average weight per gag. Relative to **Alternative 1,** increases in consumer surplus expected to result from combined changes to the size limit and to the season structure are estimated to range from $0.89 million (**Preferred Alternative 5**) to $4.01 million (**Alternatives 4-Option a**, **4-Option b**, and **4-Option c**) (2014 dollars), assuming accountability measures are in effect (Table 4.3.3.1). If accountability measures are not in effect, the increases in consumer surplus relative to **Alternative 1**, resulting from the combined changes to the size limit and to the season structure, are estimated to range from $0.89 million (**Preferred Alternative 5**) to $7.08 million (**Alternative 4a**) (Table 4.3.3.2). Although the uncertainty associated with the decision tool increases as projections are made further out into the future, it is assumed that comparable positive net economic effects would continue to result from all proposed recreational gag fishing seasons combined with the establishment of a 24-inch size limit. Compared to **Alternatives 3** and **4**, **Preferred Alternative 5**, when implemented in conjunction with **Preferred Alternative 2** and a size limit increase to 24 inches, would be expected to result in smaller gag harvests, shorter fishing seasons and lower CS increases. The combined set of preferred alternatives would be expected to result in additional longer term economic benefits stemming from improvements to the gag SPR as discussed in Chapter 2.1.

4.3.4 Direct and Indirect Effects on the Social Environment

Neither the recreational nor commercial sector has harvested its quota for gag in recent years (Table 1.3.1), meaning that optimum yield is not being achieved. If the current recreational fishing season for gag is retained (**Alternative 1**), it would be expected that recreational landings would continue to remain below the ACL, and optimum yield would not be met.

Action 1 considers raising the minimum size limit for gag to make the size limit consistent with the South Atlantic Council's minimum size limit. Increasing the size limit to 24 inches TL (**Action 1, Preferred Alternative 2**) would be expected to constrain the recreational harvest of gag and further decrease the likelihood of achieving optimum yield.

Preferred Alternative 2, and **Alternatives 3-5** would modify the recreational fishing season for gag by revising the fixed closed season. If the gag minimum size limit is increased to 24 inches TL through Action 1, the alternatives analyzed here would increase the length of the fishing season compared with the season which would result if the existing minimum size limit is retained (**Action 1, Alternative 1**). Compared with **Alternative 1**, each of the alternatives and options proposed in this action would result in greater positive direct effects by providing additional fishing opportunities to the recreational sector.

The fixed closed season of December 3-31 prevents NMFS from allowing the gag fishing season to stay open during this time, even if there is remaining quota available. Removing the December 3-31 fixed closed season (**Preferred Alternative 2**) would result in positive direct effects by removing this obstacle to achieving optimum yield. NMFS would continue to estimate the season length and prohibit further retention of gag when the ACL is projected to be met. Thus, the fixed closed season is not necessary.

Both **Alternatives 3** and **4** would remove the January through June fixed closed season. As with **Preferred Alternative 2**, NMFS would continue to estimate the season length and prohibit further retention of gag when the ACL is projected to be met. Thus, the fixed closed season is not necessary. The alternatives differ for whether the season would begin on January 1 and last until NMFS projects the ACL will be met (**Alternative 3**), or the season would end on December 31, and NMFS would project backward in time for when the ACL is estimated to be met, and setting the season opening date at that time (**Alternative 4**). Under both alternatives, positive direct effects would be expected from removing the respective fixed closed seasons.

The same set of options are provided for **Alternatives 3** and **4**, which maintain (**Options 3a** and **4a**) or remove (**Options 3b** and **4b**) the February 1 through March 31 closed season on the recreational harvest of gag beyond the 20-fathom boundary. These fixed closed seasons were implemented to protect gag during the spawning season. Anglers generally support spawning season closures, recognizing the biological benefits of protecting a stock during reproductive activity. Thus, the options to maintain the spawning season closure (**Options 3a** and **4a**) would be expected to result in some additional social benefits compared with removing the spawning season closure (**Options 3b** and **4b**). **Options 3c** and **4c** would extend the spawning season closure to all federal waters. In terms of angler support for spawning season closures, these options would be expected to provide some additional benefits compared to **Options a** and **b** under either **Alternatives 3** or **4**.

On the other hand, just as removing the fixed closed seasons would allow for a longer fishing season, the options for modifying the spawning season closures affect the length of the season, as well. Greater benefits would be expected from a longer fishing season, as more fishing opportunities are available and the likelihood of achieving optimum yield would increase. Anglers generally prefer a winter fishing season for gag, when individuals move to shallower depths and are more accessible. Thus, the fishing season that would provide the greatest positive effects would balance the maximum number of winter fishing days with the longest fishing season overall.

For the options under **Alternatives 3** and **4** and for **Preferred Alternative 5**, Table 4.3.4.1 provides a comparison of the length of the fishing season with season openings and closures. The longest fishing seasons would result under **Alternative 3, Option a** if a 24-inch TL minimum size limit is adopted in Action 1, and **Alternative 4, Option a**, retaining the 22-inch TL minimum size limit. Under these alternatives and options, however, the fishing season would be closed for most of December (**Option 3a**, 24-inch TL minimum size limit) or closed for all of January through to May 28 (**Option 4a**, 22-inch TL minimum size limit). These alternatives and

options would provide the most benefits for anglers who prefer the longest season, even if the season is closed during the winter months.

Table 4.3.4.1. Estimated gag recreational seasons based on the ACL under combinations of Action 1 size limits and Action 3, Alternatives 3 and 4 options and Preferred Alternative 5. Assumes removal of the December 3-31 fixed closed season (Preferred Alternative 2).

Action 1	Option	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	# days
Min. size limit of **22 inches TL**	**3a**	open	<20 fathoms		open				C=27	closed				239
	3b	open							C=23	closed				235
	3c	open	closed		open						C=6	closed		220
	4a	closed				O=28	open							218
	4b	closed				O=28	open							218
	4c	closed				O=28	open							218
	5	closed					open							214
Min. size limit of **24 inches TL**	**3a**	open	<20 fathoms		open								C=9	343
	3b	open											closed	334
	3c	open	closed		open									306
	4a	closed	O=Feb 6; <20 fath.		open									329
	4b	closed	O=19		open									316
	4c	open	closed		open									306
	5	closed					open							214

The alternatives and options that provide the most fishing days during the winter months of December and January, when gag are more available closer to shore, would be **Alternative 3** and **4, Option c**, under a 24-inch TL minimum size limit. Both of these alternatives include closing the harvest of gag during the February-March spawning season closure. Thus, while providing fewer total days, these alternatives and options provide the longest winter fishing season with the spawning season closure supported by many anglers.

Beginning the fishing season on June 1 rather than July 1 (**Preferred Alternative 5**) would allow the fishing season for both red snapper and gag to open on the same day. As discussed in Section 2.3, under the combination of **Preferred Alternative 2** and **Preferred Alternative 5**, the season, combined with a 24-inch minimum size limit from the Action 1 preferred alternative, is projected to provide a June 1 through December 31 open season (214 days) with recreational landings remaining below both the ACL and the ACT. If the status quo 22-inch minimum size limit were to be maintained, the projected harvest would be just 2% below the ACL and 9% above the ACT, increasing the risk that the ACL would be exceeded.

Although **Preferred Alternative 5** does not increase fishing opportunities during the winter months, as preferred by many anglers, the Council added this alternative and selected it as preferred following the testimony of many recreational anglers at the October 2015 Council meeting. Many anglers commented that a June 1 fishing season start date is preferred to July 1,

which allows both popular target species to have an open season in federal waters at the same time. Further, a June 1 fishing season start date does not coincide with the gag spawning season, and anglers generally agree that stocks should be protected during spawning times.

With selection of both **Preferred Alternative 2** and **Preferred Alternative 5**, the season could be open as long as 7 months, or 214 days; if NMFS estimates that the ACL has been caught, the season would be closed sooner for the remainder of the year. While the combination of these alternatives would provide fewer fishing days than **Preferred Alternative 2** combined with any of the estimates for season length of the options under **Alternatives 3** and **4** (Table 4.3.4.1), the opportunity to harvest both gag and red snapper on the same trip in federal waters would be expected to provide positive direct effects to recreational anglers, while avoiding an increase in fishing opportunities during the spawning season. And, the removal of the December 3-31 fixed closed season (**Preferred Alternative 2**) provides anglers who prefer a longer winter season with additional fishing opportunities as well. Thus, anglers who prefer a longer winter fishing season, and anglers who prefer to harvest red snapper and gag in federal waters on the same trip will realize increased fishing opportunities, and thus, greater direct benefits.

4.3.5 Direct and Indirect Effects on the Administrative Environment

The alternatives in Action 3 are expected to have minimal impacts to the administrative environment compared to no action. Any change to the regulations would create the additional burden on the administrative environment in the beginning; however, after the regulations are in effect **Preferred Alternatives 2** and **5** are not expected to have additional impacts on the administrative environment. **Alternative 1** (no action) the status quo would have the least impact on the administrative environment, because the seasons would remain the same. **Preferred Alternatives 2 and 5,** would maintain consistency with the shallow-water grouper closure and would be expected to have less of a burden to law enforcement than **Alternatives 3** and **4** that would create an inconsistent season with the shallow-water grouper closed season. None of the alternatives are expected to have impacts on the administrative environment beyond the initial season change. Increasing the length of the recreational gag fishing season would not be expected to increase the burden on law enforcement due to the fact that law enforcement monitors recreational harvest on a daily basis. **Alternative 3**, **Option a**, **Option b**, and **Option c**, and, **Alternative 4**, **Option a**, **Option b**, and **Option c** would have the greatest administrative burden by creating both a separate closed season for gag and a different area closure (state and federal waters). These alternatives would be expected to have the same impact on the administrative environment relative to each other.

4.4 Cumulative Effects Analysis (CEA)

Cumulative effects to the reef fish fishery have been analyzed in Amendments 30A (GMFMC 2008a), 30B (GMFMC 2008b), 31 (GMFMC 2009), and 32 (GMFMC 2011b) and are incorporated here by reference. Additional past pertinent actions affecting grouper fisheries are summarized in Section 1.4. The following description is of more recent actions (Note actions taken prior to Amendment 30B are described in detail in that amendment (GMFMC 2008b) and incorporated here by reference). Amendment 30B was approved by the Secretary in January 2009 and a final rule published (effective May 18, 2009), except for the "Edges" portion for area closures, which was effective June 24, 2009. The purpose of the amendment was to end overfishing of gag, revise red grouper management measures as a result changes in the stock condition, establish annual catch limits and AMs for gag and red grouper, manage shallow-water grouper to achieve optimum yield, and improve the effectiveness of federal management measures. In addition, Amendment 30B established management targets and thresholds for gag consistent with the requirements of the Sustainable Fisheries Act of 1996 (GMFMC 1999b), set the gag and red grouper TAC, and established interim allocations for the commercial and recreational gag and red grouper fisheries. Because regulations ending overfishing for gag were not expected to be implemented by January 1, 2009, the Council requested NMFS develop an interim rule to put in place such regulations for the 2009 fishing year. This interim rule published December 2, 2008, and was effective January 1, 2009. An emergency rule was requested by the Council restricting the bottom longline component of the reef fish fishery in the eastern Gulf to fishing outside of 50 fathoms until the deepwater grouper and tilefish quotas are filled. The quotas were filled in June 2009, at which point, the reef fish bottom longline component of the fishery was closed. The rule was effective May 18, 2009. Amendment 29 to the Reef Fish FMP was approved by the Secretary July 2009. This amendment establishes a grouper and tilefish individual fishing quota program for the commercial reef fish fishery. An interim rule to implement gag regulations by January 1, 2011, was requested by the Council to reduce gag overfishing. These measures included reducing the gag commercial quota to 100,000 pounds and closing the recreational sector. Another interim rule to implement gag regulations by June 1, 2011, was requested by the Council to reduce gag overfishing. Measures were based on a revised assessment update and allowed for a gag commercial quota of 430,000 pounds and a September 16-November 15 recreational fishing season. Amendment 32 was effective on March 12, 2012 and implemented the following:

- Set the commercial and recreational gag ACLs for 2012 through 2015 and beyond.
- Set the constant catch red grouper commercial ACL at 6.03 mp and the red grouper recreational ACL at 1.90 mp.
- Set the commercial and recreational gag ACTs for 2012 through 2015 and beyond.
- Implemented gag commercial quotas for 2012 through 2015 and beyond that included a 14% reduction from the ACT to account for additional dead discards of gag resulting from the reduced harvest.
- Modified grouper individual fishing quota (IFQ) multi-use allocations.
- Reduced the commercial minimum size limit of gag from 24 to 22 inches TL to reduce discards.
- Set the gag recreational season from July 1 through October 31 (the bag limit remained two gag in the four grouper aggregate bag limit).

- Simplified the commercial shallow-water grouper AMs by using the IFQ program to reduce redundancy.
- Added an overage adjustment and in-season measures to the gag and red grouper recreational AMs to avoid exceeding the ACL.
- Added an AM for the red grouper bag limit that would reduce the four red grouper bag limit in the future to three red grouper, and then to two red grouper, if the red grouper recreational ACL is exceeded.

The affected area of this proposed action encompasses the state and federal water of the Gulf as well as Gulf communities dependent on reef fish fishing. The proposed actions would establish new recreational size limits for gag and black grouper and a new gag recreational fishing season. These actions are not expected to have significant beneficial or adverse cumulative effects on the physical, biological/ecological, social, and economic environments as it would minimally affect fishing practices (see Chapter 4). The short-term effects are expected to be compensated for by long-term management goals to rebuild and improve the gag and black grouper stocks and allow for more recreational opportunities. This action, combined with past and reasonable foreseeable future actions (RFFAs) is not expected to have substantial adverse effects on public health or safety. Because the reef fish fishery is a multispecies fishery, there are always fish throughout the year for the recreational sector to target such that the proposed actions, along with past and RFFAs, are not expected to substantially alter the manner in which the fishery is prosecuted.

Non-FMP actions affecting the reef fish fishery have been described in previous cumulative effect analyses (e.g., Amendment 32). Two important events include impacts of the Deepwater Horizon MC252 oil spill and climate change. Impacts from the Deepwater Horizon MC252 oil spill are still being examined and peer-reviewed studies are now only just being published. The oil itself could also adversely affect adult gag, black grouper and other reef fish species. In a recent study, Weisberg et al. (2014) suggested the hydrocarbons associated with Deepwater Horizon MC252 oil spill did transit onto the Florida shelf and may be associated with the occurrences of reef fish with lesions and other deformities. However, Murawski et al. (2014) reported that the incidence of lesions on bottom dwelling fish had declined between 2011 and 2012 in the northern Gulf.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. The Environmental Protection Agency's climate change web page provides basic background information on these and other measured or anticipated effects. In addition, the Intergovernmental Panel on Climate Change has numerous reports addressing their assessments of climate change (http://www.ipcc.ch/publications_and_data/publications_and_data.shtml). Global climate changes could affect the Gulf fisheries; however, the extent of these effects is not known at this time. Possible impacts include temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (Kennedy et al. 2002). It is unclear how

climate change would affect reef fishes, and likely would affect species differently. Burton (2008) speculated climate change could cause shifts in spawning seasons, changes in migration patterns, and changes to basic life history parameters such as growth rates. 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. Hollowed et al. (2013) provided a review of projected effects of climate change on the marine fisheries and dependent communities. Integrating the potential effects of climate change into the fisheries assessment is currently difficult due to the time scale differences (Hollowed et al. 2013). The fisheries stock assessments rarely accurately project for more than a few years, a time span that would preclude detectable climate change effects. While climate change may impact Gulf reef fish species in the future, the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts would occur. Conversely, the proposed action is not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing.

The effects of the proposed actions are, and will continue to be, monitored through collection of landings data by NMFS, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. Landings data for the recreational sector in the Gulf are collected through MRIP, the Southeast Headboat Survey, and the Texas Marine Recreational Fishing Survey. In addition, the Louisiana Department of Wildlife and Fisheries and the Alabama Department of Conservation and Natural Resources have instituted programs to collect recreational landings information in their respective states.

CHAPTER 5. REGULATORY IMPACT REVIEW

5.1 Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) it provides a comprehensive review of the level and incidence of impacts associated with a 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 regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866. This RIR analyzes the impacts this action would be expected to have on the gag and black grouper components of the Gulf of Mexico reef fish fishery.

5.2 Problems and Objectives

The problems and objectives addressed by this action are discussed in Section 1.2.

5.3 Description of Fisheries

A description of the red snapper component of the Gulf reef fish fishery is provided in Section 3.3.

5.4 Impacts of Management Measures

5.4.1 Action 1 - Gag Recreational Minimum Size Limit

A detailed analysis of the economic effects expected to result from this action is provided in Section 4.1.3. The following discussion summarizes the key points of this analysis.

Without adjustments to the season length, **Preferred Alternative 2**, which would increase the gag recreational size limit from 22 to 24 inches TL, would be expected to result in lower gag recreational harvests. **Preferred Alternative 2** would be expected to result in a 20.1 % decrease in recreational gag harvests in the first year this action is fully implemented relative to the status quo. The associated loss in consumer surplus is estimated at approximately $4.25 million. Because neither the ACL nor the ACT is expected to be reached under the status quo season length, the estimated change in consumer surplus from a size limit increase would be the same whether or not accountability measures are in place for gag. Although the uncertainty associated with the decision tool increases as projections are made further out into the future, a greater size limit would be expected to continue to result in comparable decreases in harvests and in consumer surplus of similar magnitudes in subsequent years. The combined economic effects

expected to result from modifications to the recreational season and to the size limit are discussed in Section 5.3.3.

5.4.2 Action 2 - Black Grouper Recreational Minimum Size Limit

A detailed analysis of the economic effects expected to result from this action is provided in Section 4.2.3. The following discussion summarizes the key points of this analysis.

This action considers increases in the recreational minimum size limit for black grouper. **Preferred Alternative 2** would increase the size limit for black grouper to 24 inches TL to be consistent with the size limit in the South Atlantic and with the size limit for gag in the Gulf of Mexico (Action 1). An increase in the Gulf black grouper minimum size limit would be expected to result in a reduced retained catch rate, thereby resulting in adverse economic effects. By maintaining consistency across Councils and between gag and black grouper in the Gulf, **Preferred Alternative 2** would also be expected to yield economic benefits. Due to the negligible number of sampled black grouper trips and limited black grouper recreational landings in the Gulf of Mexico (M. Larkin, pers. comm. 7/21/2015), potential net economic effects that would result from **Preferred Alternative 2** are expected to be minimal.

5.4.3 Action 3 – Modifications to the Recreational Gag Fishing Season

A detailed analysis of the economic effects expected to result from this action is provided in Section 4.3.3. The following discussion summarizes the key points of this analysis.

Preferred Alternative 2 would be expected to result in positive economic effects because it would allow the fishing season proposed in **Preferred Alternative 5** to run beyond December 2. With a 22-inch minimum size limit, increases in CS expected to result from **Preferred Alternative 5** are estimated at $6.4 million if accountability measures are not in place and $3.85 million if accountability measures are in place.

The combined economic effects expected to result from the size limit increase (Action 1; **Preferred Alternative 2**) and adjustments to the fishing season (Action 3; **Preferred Alternatives 2** and **5**) are estimated at $0.89 million. These economic effects are expected to remain the same whether accountability measures are in effect or not, because gag harvests under the suite of preferred alternatives are estimated to be below the ACT. Although the uncertainty associated with the decision tool increases as projections are made further out into the future, it is assumed that comparable positive net economic effects would continue to result from the proposed recreational gag fishing season combined with the establishment of a 24 inch size limit. The combined set of preferred alternatives may result in additional long-term economic benefits stemming from improvements to the gag SPR as discussed in Chapter 2.1.

5.5 Public and Private Costs of Regulations

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

Council costs of document preparation, meetings, public hearings, and information dissemination……$35,000

NMFS administrative costs of document preparation, meetings and review $25,000

TOTAL ….....$60,000

The estimate provided above does not include any law enforcement costs. Any enforcement duties associated with this action would be expected to be covered under routine enforcement costs rather than an expenditure of new funds. It is noted that it will be more difficult and, therefore, more costly, to monitor closure periods that vary by fishing mode.

5.6 Determination of Significant Regulatory Action

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

CHAPTER 6. REGULATORY FLEXIBILITY ACT 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 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 fishery management plan (FMP) or amendment (including framework management measures and other regulatory actions) and to ensure the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the FMP and applicable statutes.

The RFA requires agencies to conduct a Regulatory Flexibility Act Analysis (RFAA) for each proposed rule. The RFAA is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. An RFAA is conducted to primarily determine whether the proposed action would have a "significant economic impact on a substantial number of small entities." The RFAA provides: 1) A description of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for, the proposed rule; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; 5) an identification, to the extent practicable, of all relevant federal rules, which may duplicate, overlap, or conflict with the proposed rule; 6) a description and estimate of the expected economic impacts on small entities; and 7) an explanation of the criteria used to evaluate whether the rule would impose "significant economic impacts".

6.2 Statement of the need for, objective of, and legal basis for the proposed action

The need for and objective of this proposed action are provided in Chapter 1. In summary, there are current inconsistencies in the recreational minimum size limits for gag and black grouper between the Gulf of Mexico (Gulf) and South Atlantic regions. In addition, the entire gag recreational annual catch limit (ACL) has not been harvested in recent years as a result of the current closed season. The objective of this proposed action is to modify the Gulf gag and black grouper recreational minimum size limits to be consistent with those of the South Atlantic and to extend the recreational season for gag in order to increase economic benefits and achieve

optimum yield (OY). The Magnuson-Stevens Fishery Conservation and Management Act provides the statutory basis for this proposed action.

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

The proposed action would modify the gag and black grouper recreational minimum size limits and the gag recreational season in the Gulf. Only recreational anglers are allowed a bag or possession limit of groupers, including gag and black grouper, in the Gulf. Captains and crew on charter vessels and headboats (for-hire businesses), as well as commercial vessels, are not permitted to retain or sell grouper species under the recreational bag limit, so the recreational management measures, including the changes proposed in this action, do not directly apply to or regulate them. Any impact to the profitability or competitiveness of for-hire fishing businesses associated with this proposed action would be indirect in nature and would be the result of changes in angler demand for charter or headboat trips. The RFA does not consider recreational anglers, who would be directly affected by this proposed action, to be small entities, so they are outside the scope of this analysis. No other small entities that would be directly affected by this proposed action have been identified.

Small entities include "small businesses," "small organizations," and "small governmental jurisdictions." The Small Business Administration (SBA) has established size standards for all major industry sectors in the U.S. including commercial finfish harvesters (NAICS code 114111), commercial shellfish harvesters (NAICS code 114112), other commercial marine harvesters (NAICS code 114119), for-hire businesses (NAICS code 487210), marinas (NAICS code 713930), seafood dealers/wholesalers (NAICS code 424460), and seafood processors (NAICS code 311710). A business primarily involved in finfish 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 $20.5 million for all its affiliated operations worldwide. For commercial shellfish harvesters, the other qualifiers apply and the receipts threshold is $5.5 million. For other commercial marine harvesters, for-hire businesses, and marinas, the other qualifiers apply and the receipts threshold is $7.5 million. A business primarily involved in seafood processing 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 employment not in excess of 500 employees for all its affiliated operations worldwide. For seafood dealers/wholesalers, the other qualifiers apply and the employment threshold is 100 employees. A small organization is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. Small governmental jurisdictions are governments of cities, counties, towns, townships, villages, school districts, or special districts, with populations less than 50,000.

6.4 Description of the projected reporting, record-keeping and other compliance requirements of the proposed action, including an estimate of the classes of small entities which will be subject to the

requirement and the type of professional skills necessary for the preparation of the report or records

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

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

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

6.6 Significance of economic impacts on a substantial number of small entities

Substantial number criterion

This proposed action would not be expected to directly affect any small entities. As a result, this proposed action, if implemented, would not be expected to affect a substantial number of small entities.

Significant economic impacts

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

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

Because no small entities would be expected to be directly affected by this proposed action, the issue of disproportionality does not arise.

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

No small entities would be expected to be directly affected by the proposed action. The proposed changes in the gag and black grouper recreational minimum size limit and the gag recreational season would only directly affect recreational anglers because these regulations only apply to anglers and not captains or crew on for-hire or commercial fishing vessels. Although anglers may change their demand for for-hire trips as a result of the proposed size limit changes or gag season closures, the effects on associated for-hire vessels would be indirect effects, which are outside the scope of the RFA. Recreational anglers are not small entities under the RFA, so any effects on these entities are similarly outside the scope of the RFA. In summary, this proposed action would not be expected to have any adverse economic effect on any small entities.

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

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

CHAPTER 7. OTHER APPLICABLE LAW

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for management of stocks included in fishery management plans in federal waters of the exclusive economic zone. However, management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems that support those fisheries. Major laws affecting federal fishery management decision-making are summarized below.

Administrative Procedure Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the Act, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider, and respond to public comment on those rules before they are finalized. The Act also establishes a 30-day waiting period from the time a final rule is published until it takes effect.

Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act of 1972 (CZMA), as amended, requires federal activities that affect any land or water use or natural resource of a state's coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state coastal management programs. The requirements for such a consistency determination are set forth in NOAA regulations at 15 CFR part 930, subpart C. According to these regulations and CZMA Section 307(c)(1), when taking an action that affects any land or water use or natural resource of a state's coastal zone, NMFS is required to provide a consistency determination to the relevant state agency at least 90 days before taking final action.

Upon submission to the Secretary of Commerce, NMFS will determine if this plan amendment is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. Their determination will then be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these states.

Data Quality Act

The Data Quality Act (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

Specifically, the Act directs the Office of Management and Budget to issue government wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." Such guidelines have been issued, directing all federal agencies to create and disseminate agency-specific standards to: (1) ensure information quality and develop a pre-dissemination review process; (2) establish administrative mechanisms allowing affected persons to seek and obtain correction of information; and (3) report periodically to Office of Management and Budget on the number and nature of complaints received.

Scientific information and data are key components of fishery management plans (FMPs) and amendments and the use of best available information is the second national standard under the Magnuson-Stevens Act. To be consistent with the Act, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data will also undergo quality control prior to being used by the agency and a pre-dissemination review.

Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended, (16 U.S.C. Section 1531 et seq.) requires federal agencies use their authorities to conserve endangered and threatened species. The ESA requires NMFS, when proposing an action for managed stocks that "may affect" critical habitat or endangered or threatened species, to consult with the appropriate administrative agency (itself for most marine species, the U.S. Fish and Wildlife Service (USFWS) for all remaining species) to determine the potential impacts of the proposed action. Consultations are concluded informally when proposed actions may affect but are "not likely to adversely affect" endangered or threatened species or designated critical habitat. Formal consultations, including a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" endangered or threatened species or adversely modify designated critical habitat. If jeopardy or adverse modification is found, the consulting agency is required to suggest reasonable and prudent alternatives. NMFS, as part of the Secretarial review process, will make a determination regarding the potential impacts of the proposed actions.

On September 30, 2011, the Protected Resources Division released a biological opinion which, after analyzing best available data, the current status of the species, environmental baseline (including the impacts of the recent Deepwater Horizon MC 252 oil release event in the northern Gulf of Mexico), effects of the proposed action, and cumulative effects, concluded that the continued operation of the Gulf of Mexico reef fish fishery is also not likely to jeopardize the continued existence of green, hawksbill, Kemp's ridley, leatherback, or loggerhead sea turtles, nor the continued existence of smalltooth sawfish (NMFS 2011a).

On September 10, 2014, NMFS published a final rule listing as threatened 20 coral species under the Endangered Species Act. Four of the newly listed coral species are found in the Gulf of

Mexico. NMFS concurs with the effects determination that the continued authorization of the Gulf of Mexico Reef Fish Fishery Management Plan (Reef Fish FMP) is not likely to adversely affect the newly listed coral species. On September 10, 2014, NMFS published a final rule (79 FR 53852) listing as threatened 20 coral species under the Endangered Species Act. Four of the newly listed coral species are found in the Gulf of Mexico. In memos dated September 16, 2014, and October 7, 2014, NMFS determined that activities associated with the subject FMP will not adversely affect any of the newly listed coral species. In the October 7, 2014, memo NMFS also determined that although the September 10, 2014, Final Listing Rule provided some new information on the threats facing *Acropora*, none of the information suggested that the previous determinations were no longer valid.

Fish and Wildlife Coordination Act

Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661-667e) **provides the basic authority for the USFWS's involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It also requires federal agencies that construct, license or permit water resource development projects to first consult with the Service (and NMFS in some instances) and State fish and wildlife agency regarding the impacts on fish and wildlife resources and measures to mitigate these impacts.**

The fishery management actions in the Gulf of Mexico are not likely to affect wildlife resources pertaining to water resource development as the economic exclusive zone is from the state water boundary extending to 200 nm from shore.

National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, (Public Law 89-665; 16 U.S.C. 470 *et seq.*) is intended to preserve historical and archaeological sites in the United States of America. Section 106 of the NHPA requires federal agencies to evaluate the impact of all federally funded or permitted projects for sites on listed on, or eligible for listing on, the National Register of Historic Places and aims to minimize damage to such places.

Historical research indicates that over 2,000 ships have sunk on the Federal Outer Continental Shelf between 1625 to 1951; thousands more have sunk closer to shore in state waters during the same period. Only a handful of these have been scientifically excavated by archaeologists for the benefit of generations to come. Further information can be found at: http://www.boem.gov/Environmental-Stewardship/Archaeology/Shipwrecks.aspx

The proposed action does not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places nor is it expected to cause loss or destruction of significant scientific, cultural, or historical resources. In the Gulf of Mexico, the *U.S.S. Hatteras*, located in federal waters off Texas, is listed in the National Register of Historic Places. Fishing activity already occurs in the vicinity of this site, but the proposed action would have no additional adverse impacts on listed historic resources, nor would they alter any regulations intended to protect them.

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, and on the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NMFS) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea and marine otters, polar bears, manatees, and dugongs.

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

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction, development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fishing activities, and studies of pinniped-fishing activity interactions.

Under section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries that places all U.S. commercial fishing activities into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishing activity. The categorization of a fishing activity in the List of Fisheries determines whether participants in that fishing activity may be required to comply with certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements.

The proposed actions are not reasonably expected to have a substantial adverse effect on endangered or threatened species, their critical habitat, marine mammals, or other non-target species. Although the reef fish fishery as a whole has adverse effects on endangered and threatened species and marine mammals, the proposed action itself cannot reasonably be expected to adversely affect these species or their critical habitat because it is not expected to substantially alter the manner in which the fishery is conducted in the Gulf of Mexico

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703) protects migratory birds. The responsibilities of federal agencies to protect migratory birds are set forth in Executive Order 13186. The U.S. Fish and Wildlife Service (USFWS) is the lead agency for migratory birds. The birds protected under this statute are many of our most common species, as well as birds listed as threatened or endangered. A memorandum of understanding (MOU) between NMFS and the USFWS, as required by Executive Order 13186 (66 FR 3853, January 17, 2001), is to promote the conservation of migratory bird populations. This MOU focuses on avoiding, or where impacts cannot be avoided, minimizing to the extent practicable, adverse impacts on migratory

birds and strengthening migratory bird conservation through enhanced collaboration between NMFS and the USFWS by identifying general responsibilities of both agencies and specific areas of cooperation. Given NMFS' focus on marine resources and ecosystems, this MOU places an emphasis on seabirds, but does not exclude other taxonomic groups of migratory birds.

Typically, fishery management actions in the Gulf of Mexico are not likely to affect migratory birds. The proposed actions are not likely to change the way in which the fishery is prosecuted. Thus, no additional impacts are reasonably expected.

Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.) regulates the collection of public information by federal agencies to ensure the public is not overburdened with information requests, the federal government's information collection procedures are efficient, and federal agencies adhere to appropriate rules governing the confidentiality of such information. The Act requires NMFS to obtain approval from the Office of Management and Budget before requesting most types of fishing activity information from the public. None of the alternatives in this amendment are expected to create additional paperwork burdens.

Prime Farmlands Protection and Policy Act

The Farmland Protection and Policy Act of 1981 (7 U.S.C. 4201) was enacted to minimize the loss of prime farmland and unique farmlands as a result of Federal actions by converting these lands to nonagricultural uses. It assures that federal programs are compatible with state and local governments, and private programs and policies to protect farmland.

The fishery management actions in the Gulf of Mexico are not likely to affect farmlands as the economic exclusive zone is from the state water boundary extending to 200 nm from shore.

National Wild and Scenic Rivers System

The National Wild and Scenic Rivers System of 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) preserves certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act safeguards the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection.

The fishery management actions in the Gulf of Mexico are not likely to affect wetland habitats as the economic exclusive zone is from the state water boundary extending to 200 nm from shore.

North American Wetlands Conservation Act

The North American Wetlands Conservation Act of 1989 (Public Law 101-233) established a wetlands habitat program, administered by the USFWS, to protect and manage wetland habitats for migratory birds and other wetland wildlife in the United States, Mexico, and Canada.

The fishery management actions in the Gulf of Mexico are not likely to affect wetland habitats as the economic exclusive zone is from the state water boundary extending to 200 nm from shore.

Executive Orders (E.O.)

E.O. 12630: Takings

The E.O. on Government Actions and Interference with Constitutionally Protected Property Rights that became effective March 18, 1988, requires each federal agency prepare a Takings Implication Assessment for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Clearance of a regulatory action must include a takings statement and, if appropriate, a Takings Implication Assessment. The NOAA Office of General Counsel will determine whether a Taking Implication Assessment is necessary for this amendment.

E.O. 12866: Regulatory Planning and Review

E.O. 12866: Regulatory Planning and Review, 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 regulatory actions that either implement a new fishery management plan or significantly amend an existing plan. RIRs provide a comprehensive analysis of the costs and benefits to society of proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O. 12866 and whether proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Analysis. A regulation is significant if it 1) Has an annual effect on the economy of $100 million or more or adversely affects 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 and communities; 2) creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency; 3) materially alters the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or 4) raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

E.O. 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations

This E.O. 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.

E.O. 12962: Recreational Fisheries

This E.O. 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, it establishes a seven-member National Recreational Fisheries Coordination Council (NRFCC) 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 NRFCC also is responsible for developing, in cooperation with federal agencies, States and Tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the E.O. requires NMFS and the USFWS to develop a joint agency policy for administering the ESA.

E.O. 13089: Coral Reef Protection

The E.O. on Coral Reef Protection requires federal agencies whose actions may affect U.S. coral reef ecosystems to identify those actions, utilize their programs and authorities to protect and enhance the conditions of such ecosystems, and, to the extent permitted by law, ensure actions that they authorize, fund, or carry out do not degrade the condition of that ecosystem. By definition, a U.S. coral reef ecosystem means those species, habitats, and other national resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., federal, state, territorial, or commonwealth waters).

Regulations are already in place to limit or reduce habitat impacts within the Flower Garden Banks National Marine Sanctuary. Additionally, NMFS approved and implemented Generic Amendment 3 for Essential Fish Habitat (GMFMC 2005), which established additional habitat areas of particular concern (HAPCs) and gear restrictions to protect corals throughout the Gulf of Mexico. There are no implications to coral reefs by the actions proposed in this amendment.

E.O. 13132: Federalism

The E.O. on Federalism requires agencies in formulating and implementing policies, to be guided by the fundamental Federalism principles. The E.O. serves to guarantee the division of governmental responsibilities between the national government and the states that was intended by the framers of the Constitution. Federalism is rooted in the belief that issues not national in scope or significance are most appropriately addressed by the level of government closest to the people. This E.O. is relevant to FMPs and amendments given the overlapping authorities of NMFS, the states, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components

of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate state, tribes and local entities (international too).

No Federalism issues were identified relative to the action to modify the management of the recreational harvest of gag. Therefore, consultation with state officials under Executive Order 12612 was not necessary. Consequently, consultation with state officials under Executive Order 12612 remains unnecessary.

E.O. 13158: Marine Protected Areas

This E.O. requires federal agencies to consider whether their proposed action(s) will affect 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 or cultural resource within the protected area. There are several marine protected areas, HAPCs, and gear-restricted areas in the eastern and northwestern Gulf of Mexico. The existing areas are entirely within federal waters of the Gulf of Mexico. They do not affect any areas reserved by federal, state, territorial, tribal or local jurisdictions.

CHAPTER 8. LIST OF PREPARERS

PREPARERS

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NMFS = National Marine Fisheries Service, SF = Sustainable Fisheries Division

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Steve Branstetter Ph.D., SERO	Gulf Branch Chief	Reviewer

GC = General Counsel, SERO=Southeast Regional Office, NEPA=National Environmental Policy Act, HC = Habitat Conservation, SEFSC=Southeast Fisheries Science Center and PR = Protected Resources Division.

CHAPTER 9. LIST OF AGENCIES CONSULTED

Federal Agencies

Gulf of Mexico Fishery Management Council's
- Scientific and Statistical Committee
- Reef Fish Advisory Panel

National Marine Fisheries Service
- Southeast Fisheries Science Center
- Southeast Regional Office

U.S. Coast Guard

Environmental Protection Agency

State Agencies

- Texas Department of Wildlife and Fisheries
- Louisiana Department of Wildlife and Fisheries
- Mississippi Department of Marine Resources
- Alabama Department of Conservation and Natural Resources
- Florida Fish and Wildlife Conservation Commission

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APPENDIX A – ALTERNATIVES CONSIDERED BUT REJECTED

The Council considered increasing the gag ACLs and modifying the ACTs, but decided on no action due to concerns about low catch rates. In addition, the commercial ACT is used to calculate gag multi-use IFQ shares under the grouper IFQ program. Therefore, alternatives 2 through 5, which would have eliminated the commercial ACT, are not viable as written. See Section 1.4 for a more detailed explanation. The alternatives that were moved to considered but rejected are as follows.

Modifications to the Gag Annual Catch Limits and Annual Catch Targets

All weights are in million pounds gutted weight. The stock annual catch limit (ACL) is allocated 61% recreational, 39% commercial.

Alternative 1. No Action. Maintain the acceptable biological catch (ABC), ACL, and annual catch target (ACT) at the existing 2015 level.

		Recreational		Commercial	
Year	ABC/Stock ACL	ACL	ACT	ACL	ACT/Quota
2015+	3.12	1.903	1.708	1.217	0.939

Alternative 2. Set ACL and ACT mid-way between status quo and the projected equilibrium optimum yield. Set the recreational ACT buffer at 8% based on the ACL/ACT control rule, and do not use a commercial ACT.

		Recreational		Commercial	
Year	Stock ACL	ACL	ACT	ACL/Quota	ACT
2015+	3.80	2.32	2.13	1.48	none

Alternative 3 Set ACL and ACT based upon the projected equilibrium optimum yield. Set the recreational ACT buffer at 8% based on the ACL/ACT control rule, and do not use a commercial ACT.

		Recreational		Commercial	
Year	Stock ACL	ACL	ACT	ACL/Quota	ACT
2015+	4.46	2.72	2.50	1.74	none

Alternative 4. Set ACL and ACT based upon SSC recommendations for ABC, 2015-2017. Set a constant ACL at the lowest ABC recommended by the SSC. Set the recreational ACT buffer at 8% based on the ACL/ACT control rule, and do not use a commercial ACT.

		Recreational		Commercial	
Year	Stock ACL	ACL	ACT	ACL/Quota	ACT
2015+	4.57	2.79	2.57	1.78	none

Alternative 5. Set ACL and ACT based upon SSC recommendations for ABC, 2015-2017. Set the stock ACL = ABC for each year. Set the recreational ACT buffer at 8% based on the ACL/ACT control rule, and do not use a commercial ACT.

		Recreational		Commercial	
Year	ABC/Stock ACL	ACL	ACT	ACL/Quota	ACT
2015	5.21	3.18	2.93	2.03	none
2016	4.75	2.90	2.67	1.85	none
2017+	4.57	2.79	2.57	1.78	none

APPENDIX B – DESCRIPTION OF RECREATIONAL CLOSURE ANALYSIS

Estimates of recreational landings during closed months were necessary to make predictions of closure dates. This was difficult because the Gulf of Mexico gag fishery has experienced numerous closures over the past 10 years. Data from the 2009 were used as a proxy for future recreational landings for waves 1 through 3 (January to June). Landings from this year were chosen because this is the most recent year where the recreational sector was open during all three of these waves. Gag was open in Waves 1 through 3 in 2010 but there was a large cold water fish kill event in January of 2010, and a relatively large portion of the Gulf of Mexico was closed in 2010 due to the Deepwater Horizon oil spill. Therefore, 2009 landings were used instead of 2010 landings. Waves 1 and 2 of 2009 were not open the entire wave because of the seasonal closure of February 1st through March 31. Total wave 1 and 2 landings were calculated using the daily landings per day in 2009 from each individual wave, and multiplying it by the number of days in the entire wave. Wave 3 landings in 2009 did not have a closure and were not modified. Data from 2013 were used as a proxy for future recreational landings for waves 4 through 6 (July to December). Landings from this year were chosen because this is the most recent year where the recreational sector was open during all three of these waves. Landings for waves 4 and 5 in 2013 did not have a closure and were not modified. Wave 6 was not open the entire wave because of a closure from December 3rd to December 31st, 2013. Total wave 6 landings were calculated using the daily landings per day in 2013 from each individual wave and multiplying it by the number of days for the entire wave. Figure B-1 provides a visual representation of the landings.

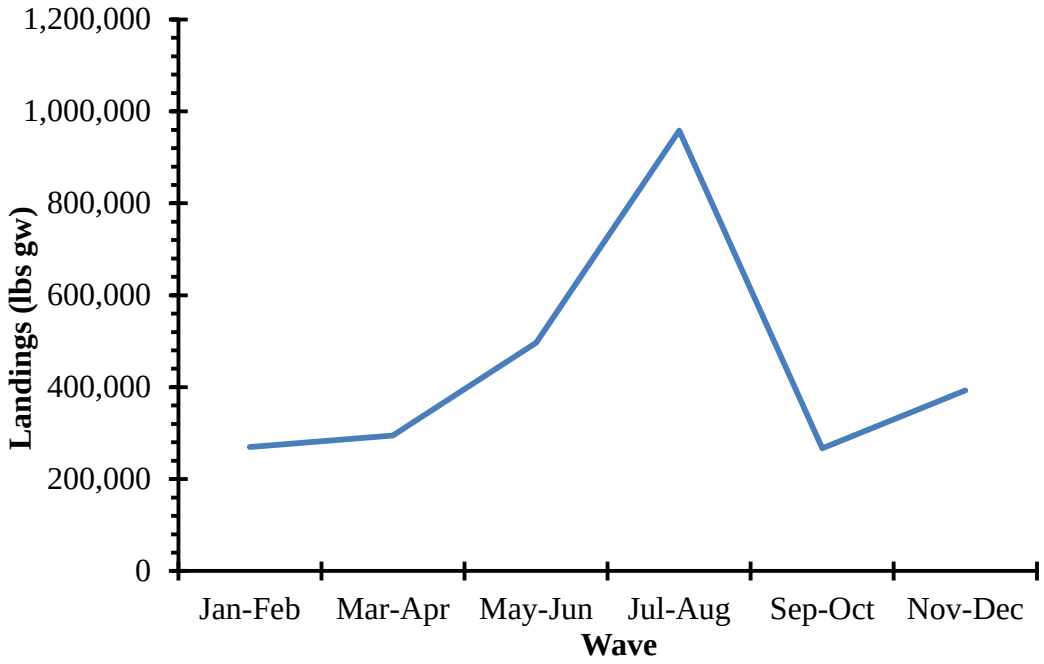

Figure B-1. Gulf of Mexico gag recreational landings by wave. Landings for waves 1 through 3 came from 2009 landings data, and landings from waves 4 through 6 came from 2013 landings. Landings are in pounds gutted weight (lbs gw).

Addressing 20 Fathom Closure

Recreational fishing for gag has been closed from February 1 through March 31 every year since 2009. However, there was a change to this closure in 2014 where a Framework Action continued a closure of harvest of gag from February 1 through March 31 but only at depths of 20 fathom and deeper. There are no relatively recent landings data with which to evaluate the impact the 20-fathom closure has had on gag landings. However, a fisheries dependent study (Sauls et al. 2014) surveyed Gulf of Mexico recreational fishermen and recorded gag catch by depth. The study collected data from 2009 through 2014 and determined 2.7% of headboat landings and 25.4% of charter boat landings of gag occurred at or deeper than 20 fathoms. No data are available on the private vessel landings and this component was assumed to have the same landings as the charter boat component. Based upon the Sauls et al. (2014) study, we assumed that the the 20-fathom closure reduced the landings by 2.7% for headboats and 25.4% for charter boat and private vessel gag landings.

Size Limits

Percent reduction in landings from increasing the minimum size limit was calculated from the length data collected in the Marine Recreational Information Program (MRIP), Southeast Headboat Survey, and Texas Parks and Wildlife recreational landings survey (TPWD). The lengths were converted to weight using conversion equations defined in SEDAR 33. The

reductions were calculated in terms of weight. Released fish were calculated from increasing the size limit and a discard mortality of 10% (from SEDAR 33) was applied. Fish killed from the discard mortality were incorporated into the reduced catch from increasing the size limit, and this increases the estimated percent reduction in landings calculated from increasing the size limit. This follows the assumption that the catch will be reduced due to a reduced stock from dead discards. Additional information on the details on calculating the percent reductions can be found at SERO-LAPP-2012-02 which is available in the internet at http://sero.nmfs.noaa.gov/sustainable_fisheries/lapp_dm/documents/pdfs/2015/sero-lapp-2012-02_caribbean_parrotfish_size_trip_limits.pdf. MRIP and TPWD reductions were calculated for both private and charter sectors.

Decision Model

The landings and impacts of the 20-fathom closure were incorporated into a decision model that allows the user to pick closure dates, and then evaluate the landings results. The closure dates are chosen as the day before the landings exceed the annual catch limit (ACL), unless the ACL was exceeded in the previous year. In that case, the closure date is chosen as the day before the landings exceed the annual catch target (ACT). Details of a decision model can be found at SERO-LAPP-2012-03.

Economic Effects

Dynamic economic effects projections are built into the gag recreational decision tool (RDT). The estimates are short-term economic effects displayed in 2014 dollars. Baseline economic values for the recreational gag fishery were estimated using the RDT with all options set to current management alternatives. For the recreational sector, economic effects are measured as changes in consumer surplus (CS) from the status quo. The RDT converts estimated pounds (gw) landed to number of fish using mean weights of gag from each wave of data. The number of fish projected to be harvested is then multiplied by the willingness to pay (WTP) to catch and keep an additional grouper[10]. This provides an estimate of the CS derived from harvesting gag, as discussed in Section 3.3.2 of the current framework action. The RDT displays the total change in CS from the status quo under any combination of ACL (or ACT) and season closure alternatives[11]. The alternatives considered in this action would increase the season length and/or the minimum size limit for gag. In isolation, a longer season would be expected to increase cumulative harvest relative to the status quo and a higher minimum size limit would be expected to decrease cumulative harvest relative to the status quo. Economic effects, measured by changes in CS, are directly calculated from the projected cumulative harvest, in numbers. When season length and size limit alternatives are analyzed together, the economic effects depend on whether or not an in-season closure is triggered, as well as the temporal distribution of harvests. This is because the recreational decision tool developed by SERO (2015) estimates the number of fish harvested using heterogeneous wave-level daily catch rates and mean fish weights. CS,

[10] The WTP value is a scalar and does not depend on the size of each individual fish harvested.
[11] Estimates of the change in CS by mode (Private, Headboat, Charter and Shore) are included under the "Economics" tab of the Excel spreadsheet.

as estimated, is based only on the number of fish and not the size of fish, so the same number of pounds would be more valuable in a month with a low mean fish weight than with a high mean fish weight. Additionally, because the recreational decision tool simulates a quota closure in the day preceding the day on which an estimated overage would occur, the overall harvest is dependent on both the daily catch rate and the aggregate harvest through the estimated in-season closure date or the end of the fishing season, whichever is sooner.

No estimates of producer surplus (PS) for the for-hire component of the recreational sector are provided. It is assumed that gag would be landed in addition to other species on a trip, including other types of grouper, and that the proposed action would have no effect on the number of recreational trips that would be expected to occur under the status quo. Therefore, no change in for-hire PS would be expected. This assumption is supported by analysis of the Marine Recreational Information Program (MRIP) data at the trip level, which shows, on average (2010-2014), one gag and six other fish (including other grouper species) were landed on each trip that harvested gag. If the gag season were shortened, it would be expected that anglers would still fish for these other species, and if it were lengthened, it would be expected that anglers would harvest gag that would have otherwise been discarded.

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