

Modification to the Recreational Red Snapper Annual Catch Target Buffers



A.C.T.

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

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ENVIRONMENTAL ASSESSMENT COVER SHEET

Name of Action

Framework Action to the Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico: Modification to the Recreational Red Snapper Annual Catch Target Buffers including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis.

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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
Council	Gulf of Mexico Fishery Management Council
GMFMC	Gulf of Mexico Fishery Management Council
Gulf	Gulf of Mexico
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MRIP	Marine Recreational Information Program
NMFS	National Marine Fisheries Service
OFL	overfishing limit
SEDAR	Southeast Data, Assessment, and Review process
SEFSC	Southeast Fisheries Science Center
SERO	NMFS Southeast Regional Office
SRHS	Southeast region headboat survey
SSC	Scientific and Statistical Committee
TAC	total allowable catch
TPWD	Texas Parks and Wildlife Department

TABLE OF CONTENTS

Environmental Assessment Cover Sheet	iii
Abbreviations Used in this Document	iv
Table of Contents	v
List of Tables	vii
List of Figures	ix
Chapter 1. Introduction	11
1.1 Background	11
1.2 Purpose and Need	16
1.3 History of Management	16
Chapter 2. Management Alternatives	19
2.1 Action 1 – Modify Red Snapper Recreational Annual Catch Target (ACT)	19
Chapter 3. Affected Environment	24
3.1 Description of the Physical Environment	24
3.2 Description of the Biological/Ecological Environment	26
3.2.1 Red Snapper	26
3.2.2 General Information on Reef Fish Species	28
3.3 Description of the Economic Environment	35
3.3.1 Commercial Sector	35
3.3.2 Recreational Sector	35
3.4 Description of the Social Environment	48
3.4.1 Fishing Communities	48
3.4.2 Environmental Justice Considerations	51
3.5 Description of the Administrative Environment	54
3.5.1 Federal Fishery Management	54
3.5.2 State Fishery Management	55
Chapter 4. Environmental Consequences	56
4.1 Action 1 – Modify Red Snapper Recreational Annual Catch Target (ACT)	56
4.1.1 Direct and Indirect Effects on the Physical Environment	56
4.1.2 Direct and Indirect Effects on the Biological/Ecological Environment	58
4.1.3 Direct and Indirect Effects on the Economic Environment	60
4.1.4 Direct and Indirect Effects on the Social Environment	62
4.1.5 Direct and Indirect Effects on the Administrative Environment	63

4.2 Cumulative Effects	65
Chapter 5. Regulatory Impact Review	67
Chapter 6. Regulatory Flexibility Analysis	68
6.1 Introduction	68
6.2 Statement of the need for, objective of, and legal basis for the proposed rule.....	68
6.3 Identification of federal rules which may duplicate, overlap or conflict with the proposed rule.....	68
6.4 Description and estimate of the number of small entities to which the proposed action would apply	68
6.5 Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule	69
6.6 Significance of economic impacts on a substantial number of small entities	69
Chapter 7. Agencies, Organizations, and Persons Consulted	70
Chapter 8. List of Preparers	71
Chapter 9. References	72
Appendix A: ACL/ACT Control Rule Worksheets	80
A.1 ACT/ACT Control Rule for the Private Angling and For-hire Components of the Recreational Sector for Gulf of Mexico Red Snapper	80
Appendix B: Public Comments Received.....	82
Appendix C. Other Applicable Law	83

LIST OF TABLES

Table 1.1.1. Red snapper federal recreational landings and quotas/ACLs. Landings are in pounds whole weight. Quotas (allowable catch limit) are in millions of pounds (mp) whole weight.....	12
Table 1.1.2. Red snapper federal recreational season durations from 2001 - 2017.	13
Table 2.1.1. Red snapper ABC projections from the September 2015 (2015-2018) and June 2018 (2019-2021) Gulf SSC meetings.....	21
Table 2.1.2. Recreational catch limits by sector component for Gulf of Mexico red snapper under Alternative 2 for the 2018 fishing season. Catch limits are in millions of pounds whole weight.....	22
Table 2.1.3. Comparison of state and federal recreational red snapper season durations applicable to the private angling component of the recreational sector. When federal waters are open, state waters are also open.	22
Table 3.2.2.1. Status of species in the Reef Fish FMP grouped by family.	29
Table 3.2.2.2. Total Gulf greenhouse gas 2014 emissions estimates (tons per year [tpy]) from oil platform and non-oil platform sources, commercial fishing, and percent greenhouse gas emissions from commercial fishing vessels of the total emissions*.....	33
Table 3.3.2.1. Number and percentage of charter/headboat permits for reef fish by state of hailing port of vessel, 2012-2016.....	36
Table 3.3.2.2. Percentage of for-hire reef fish permits by state of hailing port of vessel.	37
Table 3.3.2.3. Number and percentage of permitted for-hire fishing vessels by passenger capacity as of October 24, 2017.....	37
Table 3.3.2.4. Range, average, median, total and percent of total passenger capacity by homeport state of vessels as of October 24, 2017.....	38
Table 3.3.2.5. Number of permitted vessels by passenger capacity and homeport state as of October 24, 2017.....	38
Table 3.3.2.6. Numbers and percentages of businesses and total permitted for-hire vessels by number of permitted for-hire fishing vessels per business, October 25, 2017.	39
Table 3.3.2.7. Number of employer establishments in NAICS code 4872012 (charter fishing and party fishing boats industry).	39
Table 3.3.2.8. Number of establishments, total receipts and average receipts establishments in NAICS code 4872012 in 2012.....	40
Table 3.3.2.9. Percentage of employer establishments in NAICS code 487210 that are in the charter fishing and party fishing boats industry.....	40
Table 3.3.2.10. Number of establishments by legal form in the scenic and sightseeing transportation industry (NAICS code 487), 2015.....	41
Table 3.3.2.11. Number of headboats and charter vessels, 2012 - 2016.....	41

Table 3.3.2.12. Estimates of numbers of directed angler trips by for-hire component by state and percentage of total by Alabama and west Florida, 2012 - 2016.	42
Table 3.3.2.13. Estimates of economic impacts of directed angler trips by charter boats and their economic impacts to the state, by state.	42
Table 3.3.2.14. Estimates of economic impacts of directed angler trips by Texas charter vessels to the Gulf region.	42
Table 3.3.2.15. Number of annual headboat trips by length (hours) of trip, 2012 – 2016.	43
Table 3.3.2.16. Percentage of annual headboat trips by length of trip, 2012 – 2016.	43
Table 3.3.2.17. Number of angler days by area, 2012 – 2016.	44
Table 3.3.2.18. Percentages of total angler days by area, 2012 – 2016.	44
Table 3.3.2.19. Number and percentage of headboats with red snapper landings in 2016 by state.	44
Table 3.3.2.20. Estimates of numbers of directed angler trips by private angling component, 2012 – 2016.	45
Table 3.3.2.21. Economic impacts of average number of annual directed angler trips by private angling component in Gulf states, except Texas (2015 dollars).	46
Table 3.3.2.22. Recent for-hire and private angling landings for red snapper by component and state from 2012-2016.	46
Table 3.3.2.22 <i>continued</i>. Recent for-hire and private angling landings for red snapper by component and state from 2012-2016.	47
Table 3.4.1.1. Top ranking communities based on the number of federal for-hire permits for Gulf reef fish, including historical captain permits, in descending order.	50
Table 3.5.2.1. Gulf state marine resource agencies and web pages.	55
Table 4.3.1. Recreational component ACLs, ACTs, and ACT changes (in million pounds) relative to Alternative 1	61

LIST OF FIGURES

Figure 1.1.1. Analysis of probability of recreational red snapper quota being exceeded in 2014 at various ACT buffer levels.....	15
Figure 3.1.1. 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).....	26
Figure 3.4.1.1. Top 20 recreational fishing communities' engagement and reliance.....	49
Figure 3.4.1.2. All Gulf communities ranked by number of fish landed by headboats included in the SRHS RQ for red snapper. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.....	51
Figure 3.4.2.1. Social vulnerability indices for top commercial and recreational fishing communities.....	53
Figure 3.4.2.2. Social vulnerability indices for top commercial and recreational fishing communities continued.....	53
Figure A.1.1: ACL/ACT Control Rule for the private angling component of the recreational sector for Gulf of Mexico red snapper. 2017 landings are preliminary at the time of this analysis: 9 May 2018.....	80
Figure A.1.2: ACL/ACT Control Rule for the for-hire component of the recreational sector for Gulf of Mexico red snapper. 2017 landings are preliminary at the time of this analysis: 9 May 2018.....	81

CHAPTER 1. INTRODUCTION

1.1 Background

The commercial red snapper sector has been managed using a quota and associated closure when the quota is reached since 1990. Quota-based management of recreational red snapper was implemented in 1997 (GMFMC 1997a) in response to a provision added to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) by the Sustainable Fisheries Act of 1996. That provision, Section 407(d), requires that both the commercial and recreational red snapper harvests in the Gulf of Mexico (Gulf) be managed under a quota, and that fishing be prohibited when each respective quota is reached. From 1997 through 2013, the recreational quota was set at 49% of the total allowable catch (TAC). In 2011, the Generic Annual Catch Limit (ACL)/Accountability Measures (AMs) Amendment (GMFMC 2011) implemented ACLs and annual catch targets (ACTs); for red snapper, the quotas were determined to be equivalent to the ACL and the term “quota” was replaced with ACL. In 2015, under Amendment 40 (GMFMC 2014a), private angling and federal for-hire components of the recreational sector were established. The private angling component is comprised of private recreational anglers and for-hire operators who do not have a federal reef fish charter vessel/headboat permit. The federal for-hire component is comprised of all for-hire operators with a valid or renewable federal reef fish charter vessel/headboat permit. The recreational quota is allocated as 57.7% to the private angling component and 42.3% to the federal for-hire component.

Currently, the acceptable biological catch (ABC) is used to set the commercial and recreational quotas using the 51:49 allocation ratio as described above. Amendment 28 (GMFMC 2015a) revised the allocation ratio as 48.5:51.5, respectively, but was overturned by a court decision in March 2017. Thus the commercial and recreational sector quotas were returned to the 51:49 allocation ratio.

The recreational sector is managed with bag limits, minimum size limits, and seasonal closures. Landings for the private angling component and the for-hire component of the recreational sector from 2001 – 2017 are shown in Table 1.1.1. Season durations from 2001 – 2017 are shown in Table 1.1.2.

In 2018, all five Gulf states applied for exempted fishing permits (EFP) for a pilot study to test limited state management of the red snapper private angling component. The EFPs granted the requested allocation of the red snapper recreational quota to each state, to be harvested during the 2018 and 2019 fishing years by private anglers. The EFPs allowed the states to establish the private angling fishing season in state and federal waters for anglers landing red snapper in that state. The EFPs apply to private anglers who hold a valid recreational fishing permit issued by the state in which they land red snapper, and who are in compliance with all other state requirements for landing red snapper.¹

¹ For more information: <https://www.fisheries.noaa.gov/southeast/state-recreational-red-snapper-management-exempted-fishing-permits>

Table 1.1.1. Red snapper federal recreational landings and quotas/ACLs. Landings are in pounds whole weight. Quotas (allowable catch limit) are in millions of pounds (mp) whole weight.

Year	Private Angling Component	For-Hire Component	Recreational Total	Quota/ACL (mp)	% of Quota/ACL Landed
2001	2,846,830	2,397,973	5,244,802	4.47	117.3%
2002	3,037,152	3,484,593	6,521,745	4.47	145.9%
2003	2,987,156	3,106,886	6,094,042	4.47	136.3%
2004	3,198,600	3,261,644	6,460,244	4.47	144.5%
2005	2,175,730	2,500,188	4,675,918	4.47	104.6%
2006	1,692,246	2,438,886	4,131,132	4.47	92.4%
2007	3,142,991	2,665,802	5,808,793	3.19	182.1%
2008	2,298,321	1,757,553	4,055,874	2.45	165.5%
2009	3,362,349	2,234,508	5,596,857	2.45	228.4%
2010	1,784,709	862,660	2,647,369	3.4	77.9%
2011	4,891,368	1,842,739	6,734,107	3.87	174.0%
2012	5,284,921	2,239,320	7,524,241	3.96	190.0%
2013	8,145,917	1,556,985	9,702,902	5.39	180.0%
2014	3,268,558	566,878	3,835,436	5.39	71.2%
2015	3,806,474	-	5,960,151	4.04	94.2%
	-	2,153,677		2.96	72.8%
2016	5,293,635	-	7,436,450	4.15	127.6%
	-	2,142,815		3.04	70.5%
2017	6,593,233	-	8,862,771	3.76	175.4%
	-	2,269,538		2.85	79.6%

Source: Southeast Fisheries Science Center (SEFSC) Recreational ACL Data (June 2018).

Table 1.1.2. Red snapper federal recreational season durations from 2001 - 2017.

Year	State Season (days)					Federal Season (days)			Federal Season Dates
	FL	AL	MS	LA	TX	Federal	Private Angling	Federal For-Hire	
2001	194	194	194	194	365	194			April 21 - Oct 31
2002	194	194	194	194	365	194			April 21 - Oct 31
2003	194	194	194	194	365	194			April 21 - Oct 31
2004	194	194	194	194	365	194			April 21 - Oct 31
2005	194	194	194	194	365	194			April 21 - Oct 31
2006	194	194	194	194	365	194			April 21 - Oct 31
2007	194	194	194	194	365	194			April 21 - Oct 31
2008	194	66	66	66	365	66			June 1 - Aug 5
2009	76	76	76	76	365	76			June 1 - Aug 15
2010	78	78	78	78	365	78			June 1 - July 24; Oct 1 - Nov 21
2011	48	48	48	48	365	48			June 1 - July 19
2012	46	46	46	46	365	46			June 1 - July 17
2013	58	42	42	113	365	42			June 1 - 28; Oct 1 - Oct 14
2014	52	21	36	286	365	9			June 1 - June 9
2015	70	41	118	215	365		10	44	June 1 - June 10 (Private Angling Component), June 1 - July 14 (Federal For-Hire Component)
2016	85	66	102	279	365		11	46	June 1 - June 11 (Private Angling Component), June 1 - July 16 (Federal For-Hire Component)
2017	65	60	60	162	365		42	49	June 1 - June 3, 3-Day Weekends (Fri-Sun) June 16 - September 4 (Private Angling Component), June 1 - July 19 (Federal For-Hire Component)

History of Recreational Catch Quotas and ACT Buffers

Until 2010, the red snapper TAC was set at the ABC level, which was equivalent to what is now called the overfishing limit (OFL). In 2009, the Council's Scientific and Statistical Committee (SSC) reviewed a red snapper update assessment (SEDAR 7 Update 2009). The Council's ABC Control Rule had not yet been developed. In the absence of a control rule, the SSC in 2010 set the ABC at 75% of the OFL (GMFMC 2009a). The ABC continued to be set at either 75% of OFL or the yield corresponding to 75% of the fishing mortality level at 26% of the spawning potential ratio ($F_{26\% SPR}$) through 2012.

Prior to 2014, the recreational red snapper season length was based on the projected time for landings to reach the ACL. On March 26, 2014, in response to a legal challenge from commercial anglers, the U.S. District Court for the District of Columbia ruled that the National Marine Fisheries Service (NMFS) failed to require adequate accountability measures for the recreational sector, failed to prohibit the retention of fish after the recreational ACL had been harvested, and failed to use the best scientific information available when determining whether there should be a 2013 fall fishing season. In April 2014, in response to the Court's decision and to reduce the probability of the recreational sector exceeding its ACL (quota), the Council reviewed an analysis of the likelihood of exceeding the ACL if the fishing season were projected to an ACT set at some percentage below the ACL (Figure 1.1.1). A 20% buffer between the ACL and ACT was expected to result in a 15% probability of exceeding the recreational ACL, and the Council requested, through an emergency rule, that NMFS implement an ACT that was 20% less than the 2014 recreational ACL and would be used to set the season length (Figure 1.1.1). An October 2014 framework action (GMFMC 2014b) subsequently established AM including a recreational red snapper ACT that is 20% less than the recreational ACL and an overage adjustment in the year following a quota overage, if the stock is considered overfished.

2014 Red Snapper Season Lengths



Recreational Quota = 5.39 mp ww

Buffer (%)	Rec ACT (lbs ww)	Federal Season (days)	Prob. of Exceeding Quota
0%	5.39	17	50%
20%	4.312	11	15%
30%	3.773	8	5%
40%	3.234	5	<1%
60%	1.889	0	<1%



U.S. Department of Commerce | National Oceanic and Atmospheric Administration | NOAA Fisheries | Page 1

Figure 1.1.1. Analysis of probability of recreational red snapper quota being exceeded in 2014 at various ACT buffer levels.

Source: NMFS/SERO

The 20% buffer described above was derived by applying the ACL/ACT Control Rule developed in the Generic ACL/AM Amendment (GMFMC 2011c). The ACL/ACT Control Rule applies buffers to create target catch levels that account for management uncertainty in maintaining catches at or below the ABC. The ACL/ACT Control Rule is intended to be applied separately to the recreational and commercial sectors because each sector has different levels of management uncertainty. The ACL/ACT Control Rule recommended a 0% buffer for the commercial sector because the commercial red snapper harvest is managed by an individual fishing quota program, has accurate landings data, and has not exceeded its quota in the last seven years. Using the ACL/ACT Control Rule, the recommended red snapper recreational buffer was 20%, primarily because of the quota overages in three of the four years (2010-2013) used for calculating the buffer (GMFMC 2014b).

In the three years since the ACT was used to project season length, the actual recreational landings have been below the ACL twice (2014 and 2015), and over the ACL twice (2016 and 2017). The overage in 2016 was attributable to several Gulf states extending their state water seasons following the announcement of the federal fishing season. The overage in 2017 was attributable to the Department of Commerce extending the recreational red snapper season for private anglers following the initial federal fishing season announcement.

Amendment 40 (GMFMC 2014a) divided the recreational sector into two components: the private angling and federal for-hire components. The private angling component was apportioned 57.7% of the recreational ACL, and the federal for-hire component 42.3%. The 20% buffer between the ACL and the ACT was applied to both components individually, meaning that the ACT for each recreational component was 20% lower than that component's allocation of the recreational ACL. Amendment 40 also established a sunset provision, which would end sector separation in three years. Amendment 45 (GMFMC 2016) extended the sunset date by five years, from 2017 to 2022. In the three years since the separate components were established, the private angling component exceeded its ACL in two years and exceeded its ACT in the other year (Table 1.1.2). The federal for-hire component did not exceed its ACL or ACT in any of the years (Table 1.1.2). Amendment 40 stipulated that if the stock is considered overfished, a recreational component exceeds its allocation of the recreational ACL, and the total recreational ACL is also exceeded, then in the following fishing year, the amount of the overage from the previous fishing year will be deducted from that component's allocation of the recreational ACL. The payback adjustment has only been applied once - to the 2017 private angling ACL because of a recreational ACL overage of 129,906 lb ww in 2016 (Table 1.1.2). The overage adjustment AM does not currently apply to red snapper because the stock is no longer considered overfished.

With the 20% ACT buffer in place, the total recreational harvest (private angling and for-hire vessels combined) was 28% below its ACL in 2014, 15% below its ACL in 2015, and 3% over its ACL in 2016, and is projected to be 34% over its ACL in 2017.

1.2 Purpose and Need

The purpose is to reduce the federal for-hire component's ACT buffer for the red snapper recreational sector to a level that will allow a greater harvest while continuing to constrain landings to the component ACL as well as the total recreational ACL.

The need is to allow the recreational sector components to harvest red snapper at a level consistent with achieving optimum yield while preventing overfishing, while rebuilding the red snapper stock.

1.3 History of Management

This history of management covers events pertinent to red snapper allocation and setting quotas. A complete history of management for the FMP is available on the Council's website at http://www.gulfcouncil.org/fishery_management_plans/reef_fish_management.php and a history of red snapper management through 2006 is presented in Hood et al. (2007). The final rule for the Reef Fish FMP (with its associated environmental impact statement [EIS]) (GMFMC 1981) was effective November 8, 1984, and defined the reef fish fishery management unit, which included red snapper.

Recreational fishing for red snapper is managed with a 16-inch TL minimum size limit, 2-fish bag limit, and a season beginning on June 1 and ending when the recreational quota is projected

to be caught. Other reef fish fishery management measures that affect red snapper fishing include permit requirements for the commercial and federal for-hire fleets as well as season-area closures (e.g., Madison-Swanson and the Edges).

Red snapper allocation and quotas: The final rule for **Amendment 1** (GMFMC 1989) to the Reef Fish FMP (with its associated Environmental Assessment (EA), Regulatory Impact Review (RIR, and Initial Regulatory Flexibility Analysis [IRFA]) was effective in February 1990. The amendment specified a framework procedure for specifying the total allowable catch (TAC) to allow for annual management changes. A part of that specification was to establish a species allocation. This was based on the percentage of total landings during the base period of 1979-1987. For red snapper, the commercial sector landed 51% and the recreational sector landed 49% of red snapper over the base period. The recreational quota was established through a 1997 regulatory amendment (with its associated EA and RIR) (GMFMC 1995) with a final rule effective in October 1997. Prior to 1997, the recreational sector had exceeded its allocation of the red snapper TAC, though the overages were declining through more restrictive recreational management measures (see Section 3, Table 3.1.2). With the establishment of a recreational quota, the Regional Administrator was authorized to close the recreational season when the quota is reached as required by the Magnuson-Stevens Act. Commercial and recreational quotas, recreational allocations, and commercial and recreational landings are provided in Table 3.1.2.

At its April 2014 meeting, the Council requested an emergency rule to revise the recreational accountability measures for red snapper by applying a 20% buffer to the recreational quota, which resulted in a recreational ACT of 4.312 million pounds whole weight (NMFS 2014). The Council's decision to request an emergency rule was made following the decision of the U.S. District Court for the District of Columbia in *Guindon v. Pritzker* (March 26, 2014). A 2014 framework action created an ACT and a quota overage adjustment to apply to the 2015 fishing year and beyond (GMFMC 2014b). The action adopted an ACT based on a 20% buffer to the recreational quota. The Council also selected as preferred an overage adjustment that applies when red snapper are classified as overfished such that the amount by which the recreational quota is exceeded in a fishing season is deducted from the following year's quota.

The Council established a federal for-hire and a private angling component within the Gulf recreational sector fishing for red snapper through **Amendment 40** (with its associated EIS, RIR, and Regulatory Flexibility Act analysis) which was implemented by NMFS on May 22, 2015 (GMFMC 2014a). The federal for-hire component is comprised of all for-hire operators with a valid or renewable federal charter vessel/headboat permit for reef fish and the private angling component is comprised of other for-hire operators and private recreational anglers. Amendment 40 allocated the red snapper recreational quota and ACT among the federal for-hire (42.3%) and private angling (57.7%) components.

For-hire permit requirements: The requirement to have a permit to operate for-hire vessels in the Gulf exclusive economic zone for reef fish fishing was implemented through **Amendment 11** (with its associated EA, RIR, and IRFA) on April 1, 1996 (GMFMC 1995). The initial purpose of the permits was to address potential abuses in the two-day bag limit allowance. It was thought that by having a permit to which sanctions could be applied would improve compliance with the two-day bag limit. In addition, the permit requirement was seen as a way to

enhance monitoring of for-hire vessels in the recreational sector. **Amendment 20** (with its associated EA and RIR; GMFMC 2003), implemented on June 16, 2003, established a three-year moratorium on the issuance of new charter and headboat Gulf reef fish permits to limit further expansion in the for-hire fisheries, an industry concern, while the Council considered the need for more comprehensive effort management systems. The moratorium was extended indefinitely in **Amendment 25** (with its Supplemental EIS, RIR, and IRFA, implemented June 15, 2006 [GMFMC 2006]).

Change in the Minimum Stock Size Threshold (MSST): **Amendment 44** (GMFMC 2017) revises the threshold at which several Gulf reef fish stocks would be declared overfished. The Council's preferred alternative adopted a MSST value of 50% of the biomass at maximum sustainable yield (B_{MSY}), thereby reclassified red snapper and gray triggerfish from overfished to not overfished but rebuilding. Despite the reclassification, the rebuilding plans for these stocks would remain in place until the stocks have recovered to their respective B_{MSY} levels.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 – Modify Red Snapper Recreational Annual Catch Target (ACT)

Alternative 1: No Action. The red snapper ACTs for the recreational components will remain at 20% below the recreational component annual catch limits (ACLs).

Alternative 2: Modify the respective component ACTs for the private angling and for-hire components while maintaining the overall recreational ACT.

Buffer values between the component ACT and ACL:

Option 2a: The for-hire component ACT is 15% below the component ACL; the private angling component ACT is 23.7% below the component ACL

Option 2b: The for-hire component ACT is 10% below the component ACL; the private angling component ACT is 27.3% below the component ACL

Option 2c: The for-hire component ACT is 5% below the component ACL; the private angling component ACT is 31% below the component ACL

Preferred Alternative 3: Apply the Gulf of Mexico Fishery Management Council's ACL/ACT Control Rule, using landings from 2014 – 2017, to set the respective component ACT buffers for the private angling and for-hire components. This results in a for-hire component ACT set 9% below the for-hire component ACL. The private angling component ACT would remain at 20% below the private angling component ACL. The total recreational sector ACT would be approximately 15% below the recreational sector ACL.

Preferred Alternative 4: Establish a sunset provision on the modification of the component ACT buffers of the recreational sector for red snapper. Any changes to the recreational component ACT buffers would end at the end of the 2019 fishing season.

*Note: The Council may only choose a single option from **Alternative 2** OR **Alternative 3**. In addition, the Council may also choose **Alternative 4**.*

Discussion:

The for-hire and private angling components are managed under a single, combined recreational ACL, per Section 407(d) of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (2006). As a result, the total recreational ACL for the for-hire and private angling components combined can be exceeded if one component exceeds its ACL, even though the other component harvests less than its component ACL.

At its January 2016 meeting, the Gulf of Mexico Fishery Management Council's (Council) Standing and Special Reef Fish Scientific and Statistical Committee (SSC) reviewed the methodology used by the National Marine Fisheries Service (NMFS) to set recreational red

snapper season durations, which are currently set using the recreational sector ACT. Numerous sources of uncertainty in projecting season duration were identified, including:

- Prediction of state season duration
- Prediction of state catch rates
- Effort compression during the federal season
- Catch rates vs. the rebuilding timeline
- Fuel prices, economy, and angler behavior
- Weather conditions
- States managing toward unofficial “ACLs” vs. “ACTs”
- Time-lag in receiving recreational landings estimates
- Fall re-openings uninformed by Wave 3 recreational landings data
- Challenges estimating fall catch rates
- Precision issues with landings data
- Changes in recreational surveys
- Multiple sources for landings data, often with different methods of estimation

The SSC discussed possible approaches that could be used to evaluate a change in the ACT buffer. However, SSC members thought that, due to the numerous sources of uncertainty, there were too many unknown factors to be able to establish a scientific justification for either changing or retaining the current 20% buffer. In addition, with only two years (2015 and 2016) of landings data under sector separation (GMFMC 2014a²) available at the time of the SSC review, there were little data on which to base any analysis. The SSC members suggested that the buffer be re-evaluated in three to four years when more landings data are available for the recreational sector components. The Gulf of Mexico Fishery Management Council (Council) continued discussions on the buffer between the recreational component ACTs and ACLs at its January 2016 meeting forward to the present.

Alternative 1 (No Action) retains the recreational component ACTs, set at 20% below the recreational component ACLs, for each component. The acceptable biological catch (ABC) levels (and the resulting ACLs and ACTs) were projected to decline through 2018, and were updated based on the SEDAR 52 stock assessment (2018) for 2019-2021 (Table 2.1.1). Since the implementation of separate management for the recreational components, landings from 2015 – 2017 by the for-hire component have not exceeded their ACT or ACL, while landings in the same years by the private angling component have exceeded their respective ACT twice and the ACL once (Table 1.1.1). This suggests the fishing season duration resulting from the current 20% buffer (**Alternative 1**) is constraining harvest for the for-hire component, but not for the private angling component.

² Amendment 40 to the Fishery Management Plan [FMP] for Reef Fish Resources in the Gulf of Mexico [Reef Fish FMP]

Table 2.1.1. Red snapper ABC projections from the September 2015 (2015-2018) and June 2018 (2019-2021) Gulf SSC meetings.

Year	ABC Projection
2015	14.30 mp
2016	13.96 mp
2017	13.74 mp
2018	13.74 mp
2019	16.02 mp
2020	14.98 mp
2021	14.28 mp

Note: Estimates for 2015-2018 assume discards continue at 2013 levels, and are from the SEDAR 31 Update (2014) assessment. Estimates for 2019-2021 assume discards continue at 2016 levels, use 2017 provisional landings, assume 100% of the 2018 ABC will be landed, and are from the SEDAR 52 (2018) assessment.

Alternative 2 would maintain the overall recreational ACT, but modify the respective component ACT buffers for the private angling and for-hire components of the recreational sector for red snapper. The options only consider decreasing the for-hire component buffer while increasing the private angling component's buffer, because only the private angling component has exceeded its ACL during the 3 years for which the components have been managed separately (GMFMC 2014a; twice, in 2016 and 2017). As such, increasing the ACT buffer on the private angling component may decrease the likelihood of that component exceeding its ACL; whereas, decreasing the ACT buffer on the for-hire component may increase the likelihood of that sector component reaching its ACL.

Because the recreational sector allocations for the private angling (57.7%) and for-hire (42.3%) components are not equal, the percent change in component buffers as they increase or decrease will not be one-to-one. For example, decreasing the for-hire buffer by 5% and increasing the private angling component's buffer by 5% results in a combined recreational sector ACT which is smaller than it would be if the combined recreational sector ACT was set at 20% less than the recreational ACL. Therefore, the options in **Alternative 2** are adjusted such that a 5% decrease in the for-hire component buffer corresponds to a commensurate increase in the private angling component's buffer, thereby, resulting in a combined ACT which is equivalent to the current recreational ACT based on the 20% buffer. **Alternative 2** has three options for modifying the recreational component ACT buffers: **Option 2a** would set the ACT buffers at 15% for the for-hire component and 23.7% for the private angling component; **Option 2b** would set the ACT buffers at 10% for the for-hire component and 27.3% for the private angling component; and **Option 2c** would set the ACT buffers at 5% for the for-hire component; 31.0% for the private angling component. Under each of these options, the component ACTs, when added, equal the recreational sector ACT (Table 2.1.2).

Table 2.1.2. Recreational catch limits by sector component for Gulf of Mexico red snapper under Alternative 2 for the 2018 fishing season. Catch limits are in millions of pounds whole weight.

Sector Component	Component ACL	Component ACT: Option 2a	Component ACT: Option 2b	Component ACT: Option 2c
Private Angling	3.885	2.965	2.823	2.681
Federal For-hire	2.848	2.421	2.563	2.706
Recreational ACT	-	5.386	5.386	5.386

In 2014, the Council initially specified a preference for a 15% risk of exceeding the ACL, which at the time corresponded to a 20% buffer between the ACT and the ACL. It is critical to note that the factors which determine the risk of exceeding the ACL will vary by year. This means that a fixed buffer between the ACT and ACL for a component will correspond to a variable amount of risk of exceeding the ACL every year. However, as data collection methods improve and so long as changes in the management environment are infrequent, it is possible that the risk of exceeding the ACL associated with a fixed buffer may decrease over time.

The recreational sector for red snapper in the Gulf is managed under a single ACL and ACT for the entire Gulf, which includes state and federal waters. As such, the harvest of red snapper by the recreational sector from waters within this area counts against the catch limits. The duration of a red snapper fishing season (private angling or for-hire) is based on a prediction of when the component's ACT will be caught. The duration of state private angling fishing seasons in recent years (2013+) has increased, resulting in fewer fishing days for private anglers in federal waters (Table 2.1.3). This resulted in approximately 81% of the ACL for the private angling component initially being projected to be landed in state waters in the 2017 fishing season, leaving the remainder to be harvested during the season for federal waters (NMFS 2017).

Table 2.1.3. Comparison of state and federal recreational red snapper season durations applicable to the private angling component of the recreational sector. When federal waters are open, state waters are also open.

Year	Federal Season	State Season				
		FL	AL	MS	LA	TX
2012	46	46	46	46	46	366
2013	42	65	42	42	100	365
2014	9	52	21	21	286	365
2015	10	70	41	118	215	365
2016	12	78	43	120	272	366
2017*	42	78	67	102	135	365

* The 2017 red snapper fishing season for private anglers was extended by 39 days on June 6th, 2018 by the Secretary of Commerce.

Preferred Alternative 3 would modify the buffer for the for-hire component ACT only, based on the results of the Council's ACL/ACT Control Rule, using landings from 2014 – 2017. Because the separate management of the private angling and federal for-hire components (GMFMC 2014a) was not implemented until 2015, landings data from 2014 represent the combined landings of both recreational sector components. To make data from 2014 comparable to data from 2015 – 2017, the allocation for the separate components was applied to the simulations under the Council's ACL/ACT Control Rule (in Appendix A) to the landings data from 2014. With respect to how the Council's ACL/ACT Control Rule determines an appropriate buffer between the ACL and ACT, the actual amount of the landings is not important; only whether the landings exceed the ACL impacts the buffer determination. Based on the Council's ACL/ACT Control Rule, the recommended weighted buffer for the private angling component would be 18% (Appendix A; Figure A.1.1) and 9% for the for-hire component (Appendix A; Figure A.1.2). It is important to note that these buffers have been determined independent of one another, are component-specific, and should not be combined to represent what the buffer should be for the recreational sector as a whole. Further, the private angling component ACT buffer is not being considered for adjustment under **Preferred Alternative 3** because the weighted buffer resulting from the Council's ACL/ACT Control Rule is 18%, compared to the current buffer of 20%, and the private angling component has exceeded its ACT and ACL in both of the previous two years. Reducing that component's ACT buffer may further increase the probability of exceeding the private angling component's ACL in the future.

Preferred Alternative 4 would establish a sunset provision on any modification of the red snapper recreational component ACTs, if established in **Alternative 2** or **Preferred Alternative 3**. If **Alternative 1** is selected as preferred, then **Preferred Alternative 4** would not be functional. If an option in **Alternative 2**, or **Preferred Alternative 3**, is selected as preferred, then **Preferred Alternative 4** would terminate the management change at the end of 2019, meaning any change to the for-hire component buffer would only be applicable for a single fishing year. Terminating any changes in management in 2019 would correspond with the end dates of the exempted fishing permits currently being used by the five Gulf states to demonstrate alternative strategies for recreational red snapper management for private anglers. If **Preferred Alternative 4** is not selected as preferred, then any change to the component-specific ACTs would end when the separate management of the private angling and federal for-hire components is scheduled to sunset in 2022 (GMFMC 2016) and the buffer on the total recreational ACL would be 20%.

CHAPTER 3. AFFECTED ENVIRONMENT

The actions considered in this amendment with associated environmental assessment would affect primarily fishing for red snapper in federal and state waters of the Gulf of Mexico (Gulf). Descriptions of the physical, biological, economic, social, and administrative environments were completed in the environmental impact statements (EIS) for Reef Fish Amendments 27/Shrimp Amendment 14 (GMFMC 2007), 30A (GMFMC 2008a), 30B (GMFMC 2008b), 32 (GMFMC 2011a), 40 (GMFMC 2014a), 28 (GMFMC 2015a), the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004a), and the Generic Annual Catch Limits/Accountability Measures (ACL/AM) Amendment (GMFMC 2011b). Below, information on each of these environments is summarized or updated, as appropriate.

3.1 Description of the Physical Environment

The Gulf has a total area of approximately 600,000 square miles (1.5 million km²), 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 3.1.1). 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 Fechtelm 2005). Gulf water temperatures range from 54° F to 84° F (12° C to 29° C) depending on time of year and depth of water. Mean annual sea surface temperatures ranged from 73 ° F through 83° F (23-28° C) including bays and bayous (Figure 3.1.1) 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 Gulf reef fish, including red snapper, is also detailed in the environmental impact statements (EIS) for the Generic EFH Amendment, the Generic ACL/AM Amendment, and Reef Fish Amendments 28 and 40 (refer to GMFMC 2004a; GMFMC 2011c; GMFMC 2014a; GMFMC 2015a) and are incorporated by reference and further summarized below. In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. A planktonic larval stage lives in the water column and feeds on zooplankton and phytoplankton (GMFMC 2004a). Juvenile and adult reef fish are typically demersal and usually associated with bottom topographies on the continental shelf (<100m) 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. For example, juvenile red snapper are common on mud bottoms in the northern Gulf, particularly off Texas through Alabama. Also, some juvenile snapper (e.g. mutton, gray, red, dog, lane, and yellowtail snappers) and grouper (e.g. Goliath grouper, red, gag, and yellowfin groupers) have been documented in inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems.

In the Gulf, fish habitat for adult red snapper consists of submarine gullies and depressions; coral reefs, rock outcroppings, and gravel bottoms; oilrigs; and other artificial structures (GMFMC

2004a). Detailed information pertaining to the closures and preserves is provided in the February 2010 Regulatory Amendment (GMFMC 2010).

There are several marine reserves, habitat areas of particular concern, and restricted fishing gear areas in the Gulf. These are detailed in GMFMC (2005 and 2018). The Bureau of Ocean Energy Management lists historic shipwrecks that occur in the Gulf. Most of these sites are in state or deep (>1,000 feet or 328 meters) waters. There is one site located in federal waters in less than 100 feet (30 meters) that could be affected by reef fish fishing. This is the *U.S.S. Hatteras* located approximately 20 miles (12 kilometers) off Galveston, Texas.

There are environmental sites of special interest that are discussed in the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004a) that are relevant to reef fish management. These include the longline/buoy area closure, the Edges Marine Reserve, Tortugas North and South Marine Reserves, individual reef areas and bank habitat areas of particular concern (HAPCs) of the northwestern Gulf, the Florida Middle Grounds HAPC, the Pulley Ridge HAPC, and Alabama Special Management Zone. These areas are managed with gear restrictions to protect habitat and specific reef fish species. These restrictions are detailed in the Generic EFH Amendment (GMFMC 2004a) and the draft EIS for Amendment 9 to the Fishery Management Plan for the Coral and Coral Reefs of the Gulf of Mexico, U.S. Waters (GMFMC 2018).

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 (see Figure 3.3.2.1). 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 ashore in several areas of the Gulf as did 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. A discussion of the additional impacts to the physical, biological, economic, social, and administrative environments affected by the oil spill is contained in the January 2011 Regulatory Amendment (GMFMC 2011b) and is incorporated here by reference. For more information on physical impacts of the *Deepwater Horizon* MC252 oil spill, see http://sero.nmfs.noaa.gov/deepwater_horizon_oil_spill.htm.

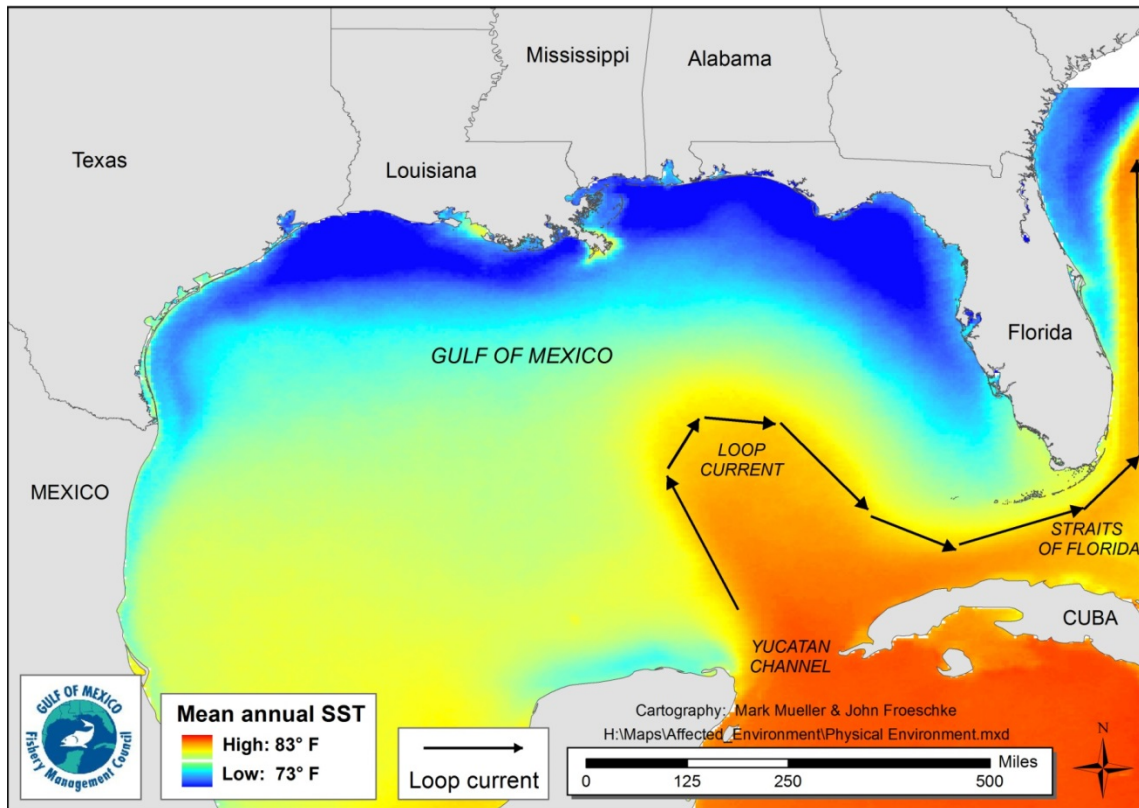


Figure 3.1.1. Physical environment of the Gulf including major feature names and mean annual sea surface temperature as derived from the Advanced Very High Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (<http://accession.nodc.noaa.gov/0072888>)

3.2 Description of the Biological/Ecological Environment

The biological environment of the Gulf, including that of red snapper, is described in detail in the final environmental impact statement for the Generic EFH Amendment, as well as other amendments such as the Generic ACL/AM Amendment, and Reef Fish Amendments 28 and 40 (refer to GMFMC 2004a; GMFMC 2011c; GMFMC 2014a; GMFMC 2015). These are incorporated herein by reference.

3.2.1 Red Snapper

Red Snapper Life History and Biology

Red snapper demonstrate the typical reef fish life history pattern. Eggs and larvae are pelagic while juveniles are found associated with bottom features or over mud bottom and oyster shell reef. Spawning occurs over firm sand bottom with little relief away from reefs during the summer and fall. Adult females mature as early as two years and most are mature by four years (Schirripa and Legault 1999). Red snapper have been aged up to 57 years (Wilson and Nieland 2001). Until 2013, most red snapper caught by the directed fishery were two to four years old, but the SEDAR 31 benchmark stock assessment suggested that the age and size of red snapper in the directed fishery has increased (SEDAR 31 2013). A more complete description of red

snapper life history can be found in the Generic EFH Amendment (GMFMC 2004a). The most recent SEDAR 52 (2018) stock assessment found that the red snapper resource continues to rebuild from the severely overfished and depleted conditions during of the 1980s and 1990s. Under current conditions, it is expected that the resource will continue to rebuild. However, projections demonstrate opposing trends in regional population sizes with the eastern region expected to decline rapidly, while the western region continues to steadily rebuild.

Status of the Red Snapper Stock

SEDAR 52 Assessment

The SEDAR 52 base model was similar to the continuity model, with select updates to model fitting procedures. Biomass estimates show the western Gulf continues to rebuild, while the eastern Gulf has leveled off over the last few years. The number of older fish present has increased Gulf-wide, indicating rebuilding age structure. The Gulf red snapper stock is not considered to be overfished (spawning stock biomass [SSB]/minimum stock size threshold [MSST] = 1.41) or undergoing overfishing (current fishing mortality rate [F]/maximum fishing mortality threshold [MFMT] = 0.823). The projections under the rebuilding plan constrain the catch limits to rebuild the stock by 2032. The change in the MSST value to 50% of the SSB at the maximum sustainable yield (26% spawning potential ratio [SPR]) in Amendment 44 (GMFMC 2017) was the primary reason for the change in stock status from overfished to not overfished.

The Council is currently (as of July 2018) developing a framework action which considers modifying the red snapper ACLs and ACTs in response to the most recent stock assessment. That framework action will be considered for final action by the Council in August 2018 with the target of getting the ACLs and ACTs implemented for the 2019 fishing year.

Definition of Overfishing

In January 2012, the Generic ACL/AM Amendment (GMFMC 2011b) became effective. One of the provisions in this amendment was to redefine overfishing. In years when there is a stock assessment, overfishing is defined as the fishing mortality rate exceeding the maximum fishing mortality threshold. In years when there is no stock assessment, overfishing is defined as the catch exceeding the OFL. The SEDAR 31 update assessment (2014) indicated that, as of the terminal year of the assessment data, 2013, overfishing was not occurring. Note that, because the overfishing threshold is now re-evaluated each year instead of only in years when there is a stock assessment, this status could change on a year-to-year basis.

Amendment 44: Change in Minimum Stock Size Threshold (MSST)

The MSST is the SSB level at which a stock is declared overfished and a rebuilding plan must be implemented. MSST for red snapper was previously estimated using the formula $(1-M) \cdot B_{MSY}$, where M is the natural mortality rate and B_{MSY} is the stock biomass level at which the MSY can be harvested on a continuing basis. Using this formula, red snapper was considered overfished. Amendment 44 (GMFMC 2017) changed the calculation for the red snapper MSST to be 50% of

B_{MSY} , which is the widest buffer between SSB at MSY and MSST allowed under the National Standard 1 guidelines. The resulting estimate of MSST reclassified red snapper to not overfished but rebuilding. Despite the reclassification, the rebuilding plan for the stock remains in place until the stock has recovered to its B_{MSY} .

3.2.2 General Information on Reef Fish Species

The National Ocean Service collaborated with NMFS and the Council to develop distributions of reef fish (and other species) in the Gulf (SEA 1998).

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. Larval fish feed on zooplankton and phytoplankton. Gray triggerfish are exceptions to this generalization as they lay their eggs in nests on the sandy bottom (Simmons and Szedlmayer 2012), and gray snapper whose larvae are found around submerged aquatic vegetation.

Status of Reef Fish Stocks

The Reef Fish Fishery Management Plan (FMP) currently encompasses 31 species (Table 3.2.2.1). Eleven other species were removed from the FMP in 2012 through the Generic ACL/AM Amendment (GMFMC 2011a).

The NMFS Office of Sustainable Fisheries updates its Status of U.S. Fisheries Report to Congress³ on a quarterly basis utilizing the most current stock assessment information. Stock assessments and status determinations have been conducted and designated for 12 stocks and can be found on the Council⁴ and SEDAR⁵ websites. Of the 12 stocks for which stock assessments have been conducted, the fourth quarter report of the 2017 Status of U.S. Fisheries classifies only one as overfished (greater amberjack), and two stocks as undergoing overfishing (greater amberjack and gray triggerfish).

The status of both assessed and unassessed stocks, as of the most recent version of the Status of U.S. Fisheries Report, is provided in Table 3.2.2.1. Amendment 44 (GMFMC 2017), implemented December 2017, modified the MSST for seven species in the Reef Fish FMP. Red snapper and gray triggerfish are now listed as not overfished but rebuilding, because the biomass for the stock is currently estimated to be greater than 50% of B_{MSY} . The greater amberjack stock remains classified as overfished.

The remaining species within the Reef Fish FMP do not currently have completed stock assessments. Therefore, their stock status is unknown (Table 3.2.2.1). For those species that are listed as not undergoing overfishing, that determination has been made based on the annual harvest remaining below the OFL. No other unassessed species are scheduled for a stock assessment at this time.

³ http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/status_updates.html

⁴ www.gulfcouncil.org

⁵ www.sedarweb.org

Table 3.2.2.1. Status of species in the Reef Fish FMP grouped by family.

Common Name	Scientific Name	Stock Status		Most recent assessment or SSC workshop
		Overfishing	Overfished	
Family Balistidae – Triggerfishes				
gray triggerfish	<i>Balistes capriscus</i>	Y	N	SEDAR 43 2015
Family Carangidae – Jacks				
greater amberjack	<i>Seriola dumerili</i>	Y	Y	SEDAR 33 Update 2016a
lesser amberjack	<i>Seriola fasciata</i>	N	Unknown	SEDAR 49 2016
almaco jack	<i>Seriola rivoliana</i>	N	Unknown	SEDAR 49 2016
banded rudderfish	<i>Seriola zonata</i>	Unknown	Unknown	
Family Labridae – Wrasses				
hogfish	<i>Lachnolaimus maximus</i>	N	N	SEDAR 37 Update 2018
Family Malacanthidae – Tilefishes				
tilefish (golden)	<i>Lopholatilus chamaeleonticeps</i>	N	N	SEDAR 22 2011a
blueline tilefish	<i>Caulolatilus microps</i>	Unknown	Unknown	
goldface tilefish	<i>Caulolatilus chrysops</i>	Unknown	Unknown	
Family Serranidae – Groupers				
gag	<i>Mycteroperca microlepis</i>	N	N	SEDAR 33 Update 2016b
red grouper	<i>Epinephelus morio</i>	N	N	SEDAR 42 2015
scamp	<i>Mycteroperca phenax</i>	Unknown	Unknown	
black grouper	<i>Mycteroperca bonaci</i>	N	N	SEDAR 19 2010
yellowedge grouper	<i>Hyporthodus flavolimbatus</i>	N	N	SEDAR 22 2011b
snowy grouper	<i>Hyporthodus niveatus</i>	N	Unknown	SEDAR 49 2016
speckled hind	<i>Epinephelus drummondhayi</i>	N	Unknown	SEDAR 49 2016
yellowmouth grouper	<i>Mycteroperca interstitialis</i>	N	Unknown	SEDAR 49 2016
yellowfin grouper	<i>Mycteroperca venenosa</i>	Unknown	Unknown	
warsaw grouper	<i>Hyporthodus nigritus</i>	N	Unknown	
*Atlantic goliath grouper	<i>Epinephelus itajara</i>	N	Unknown	SEDAR 47 2016
Family Lutjanidae – Snappers				
queen snapper	<i>Etelis oculatus</i>	N	Unknown	
mutton snapper	<i>Lutjanus analis</i>	N	N	SEDAR 15A Update 2015
blackfin snapper	<i>Lutjanus buccanella</i>	N	Unknown	
red snapper	<i>Lutjanus campechanus</i>	N	N	SEDAR 52 2018
cubera snapper	<i>Lutjanus cyanopterus</i>	N	Unknown	
gray snapper	<i>Lutjanus griseus</i>	Y	Unknown	SEDAR 51 2018
lane snapper	<i>Lutjanus synagris</i>	N	Unknown	SEDAR 49 2016
silk snapper	<i>Lutjanus vivanus</i>	Unknown	Unknown	
yellowtail snapper	<i>Ocyurus chrysurus</i>	N	N	SEDAR 27A 2012
vermilion snapper	<i>Rhomboplites aurorubens</i>	N	N	SEDAR 45 2016
wenchman	<i>Pristipomoides aquilonaris</i>	N	N	SEDAR 49 2016

Note: *Atlantic goliath grouper is a protected grouper (i.e., ACL is set at zero) and benchmarks do not reflect appropriate stock dynamics.

Bycatch

Bycatch is defined as fish harvested in a fishery, but not sold or retained for personal use. This definition includes both economic and regulatory discards, and excludes fish released alive under a recreational catch-and-release fishery management program. Economic discards are generally

undesirable from a market perspective because of their species, size, sex, and/or other characteristics. Regulatory discards are fish required by regulation to be discarded, but also include fish that may be retained but not sold. Bycatch practicability analyses of the reef fish fishery, and specifically red snapper, have been provided in several reef fish amendments. Bycatch practicability analyses have been completed for red snapper (GMFMC 2004b, GMFMC 2007, GMFMC 2014a, and GMFMC 2015b). The bycatch related to this action may impact red snapper, other reef fish species, protected resources, and birds. However, these impacts are not expected to change from status quo.

Protected Species

NMFS manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). A very brief summary of these two laws and more information is available on NMFS Office of Protected Resources website⁶. There are 21 ESA-listed species of marine mammals, sea turtles, fish, and corals that may occur in the EEZ of the Gulf. There are 91 stocks of marine mammals managed within the Southeast region plus the addition of the stocks such as North Atlantic right whales (NARWs), and humpback, sei, fin, minke, and blue whales that regularly or sometimes occur in Southeast region managed waters for a portion of the year (Hayes et al. 2017). All marine mammals in U.S. waters are protected under the MMPA.

Of the four of the marine mammals (sperm, sei, fin, and Gulf of Mexico Bryde's) protected under the MMPA, three are also listed as endangered under the ESA and may occur in the Gulf. Bryde's whales are the only resident baleen whales in the Gulf and are currently being evaluated to determine if listing under the ESA is warranted (81 FR 88639; December 8, 2016). Manatees, listed as threatened under the ESA, also occur in the Gulf and are the only marine mammal species in these areas managed by the U.S. Fish and Wildlife Service.

The gear used by the Gulf reef fish fishery is classified in the MMPA 2018 List of Fisheries as a Category III fishery (83 FR 5349). 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 the reef fish fishery. Bottlenose dolphins prey upon on the 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. Marine Mammal Stock Assessment Reports and additional information are available on the NMFS Office of Protected Species website: <http://www.nmfs.noaa.gov/pr/sspecies/>.

Sea turtles, fish, and corals that are listed as threatened or endangered under the ESA and occur in the Gulf include the following: five species of sea turtles (Kemp's ridley, loggerhead, green, leatherback, and hawksbill); five species of fish (Gulf sturgeon, smalltooth sawfish, Nassau grouper, oceanic whitetip shark and giant manta ray); and seven species of coral (elkhorn, staghorn, lobed star, mountainous star, boulder star, pillar, and rough cactus). Critical habitat designated under the ESA for smalltooth sawfish, Gulf sturgeon, and the Northwest Atlantic

⁶ <http://www.nmfs.noaa.gov/pr/laws/>

Ocean DPS of loggerhead sea turtles occur in the Gulf, though only loggerhead critical habitat occurs in federal waters.

The most recent biological opinion (opinion) for the FMP was completed on September 30, 2011. The opinion determined the continued authorization of the Gulf reef fish fishery managed under the Reef Fish FMP is not likely to adversely affect ESA-listed marine mammals or coral, and was not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) or smalltooth sawfish. Since issuing the opinion, in memoranda dated September 16, 2014, and October 7, 2014, NMFS concluded that the activities associated with the Reef Fish FMP is not likely to adversely affect critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle distinct population segment (DPS) and four species of corals (*Mycetophyllia ferox*, *Orbicella annularis*, *O. faveolata*, and *O. franksi*). On September 29, 2016, NMFS requested reinitiation of Section 7 consultation on the continued authorization of reef fish fishing managed by the Reef Fish FMP because new species (i.e., Nassau grouper [81 FR 42268] and green sea turtle North Atlantic and South Atlantic DPSs [81 FR 20057]) have been listed under the ESA that may be affected by the proposed action. NMFS documented a determination that allowing the fishery to continue during the reinitiation period is not likely to adversely affect these species.

Recently, on January 22, 2018, NMFS published a final rule (83 FR 2916) listing the giant manta ray as threatened under the ESA. On January 30, 2018, NMFS published a final rule (83 FR 4153) listing the oceanic whitetip shark as threatened under the ESA. In a memorandum dated March 6, 2018, NMFS reinitiated consultation on the Reef Fish FMP to address the listings of the giant manta and oceanic whitetip. The consultation determined that allowing fishing under the Reef Fish FMP to continue during the re-initiation period will not appreciably reduce the likelihood of the giant manta ray's survival or recovery within its range and is not likely to adversely affect oceanic whitetip sharks.

Northern Gulf of Mexico Hypoxic Zone

Every summer in the northern Gulf, a large hypoxic zone forms. It is the result of allochthonous materials and runoff from agricultural lands by rivers to the Gulf, increasing nutrient inputs from the Mississippi River, and a seasonal layering of waters in the Gulf. The layering of the water is temperature and salinity dependent and prevents the mixing of higher oxygen content surface water with oxygen-poor bottom water. For 2014, the extent of the hypoxic area was estimated to be 5,052 square miles and is similar the running average for over the past five years of 5,543 square miles Gulf⁷. The hypoxic conditions in the northern Gulf directly impact less mobile benthic macroinvertebrates (e.g., polychaetes) by influencing density, species richness, and community composition (Baustian and Rabalais 2009). However, more mobile macroinvertebrates and demersal fishes (e.g., red snapper) are able to detect lower dissolved oxygen levels and move away from hypoxic conditions. Therefore, although not directly affected, these organisms are indirectly affected by limited prey availability and constrained available habitat (Baustian and Rabalais 2009; Craig 2012).

⁷ <http://www.gulfhypoxia.net/>

Climate change

Climate change projections predict increases in sea-surface temperature and sea level; decreases in sea-ice cover; and changes in salinity, wave climate, and ocean circulation (Intergovernmental Panel on Climate Change [IPCC]).⁸ These changes are likely to affect plankton biomass and fish larvae abundance that could adversely impact fish, marine mammals, seabirds, and ocean biodiversity. Kennedy et al. (2002) and Osgood (2008) have suggested global climate change could affect temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; change precipitation patterns and cause 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 influence the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs. The National Oceanic and Atmospheric Association (NOAA) Climate Change Web Portal⁹ predicts the average sea surface temperature in the Gulf will increase by 1-3°C for 2010-2070 compared to the average over the years 1950-2010. For reef fishes, 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. It is unclear if Reef Fish distribution in the Gulf and South Atlantic has been affected. The smooth puffer and common snook are examples of species for which there has been a distributional trend to the north in the Gulf. For other species such as red snapper and the dwarf sand perch, there has been a distributional trend towards deeper waters. For other fish species, such as the dwarf goatfish, there has been a distributional trend both to the north and to deeper waters. These changes in distributions have been hypothesized as a response to environmental factors such as increases in temperature.

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 project through a time span that would include detectable climate change effects.

Greenhouse gases

The IPCC has indicated greenhouse gas emissions are one of the most important drivers of recent changes in climate. Wilson et al. (2017) inventoried the sources of greenhouse gases in the Gulf from sources associated with oil platforms and those associated with other activities such as fishing. A summary of the results of the inventory are shown in Table 3.2.2.2 with respect to total emissions and from fishing. Commercial fishing and recreational vessels make up a small percentage of the total estimated greenhouse gas emissions from the Gulf (2.04% and 1.67%, respectively).

⁸ <http://www.ipcc.ch/>

⁹ <https://www.esrl.noaa.gov/psd/ipcc/>

Table 3.2.2.2. Total Gulf greenhouse gas 2014 emissions estimates (tons per year [tpy]) from oil platform and non-oil platform sources, commercial fishing, and percent greenhouse gas emissions from commercial fishing vessels of the total emissions*.

Emission source	CO ₂	Greenhouse CH ₄	Gas N ₂ O	Total CO _{2e} **
Oil platform	5,940,330	225,667	98	11,611,272
Non-platform	14,017,962	1,999	2,646	14,856,307
Total	19,958,292	227,665	2,743	26,467,578
Commercial fishing	531,190	3	25	538,842
Recreational fishing	435,327	3	21	441,559
Percent commercial fishing	2.66%	>0.01%	0.91%	2.04%
Percent recreational fishing	2.18%	>0.01%	0.77%	1.67%

*Compiled from Tables 6-11, 6-12, and 6-13 in Wilson et al. (2017). **The CO₂ equivalent (CO_{2e}) emission estimates represent the number of tons of CO₂ emissions with the same global warming potential as one ton of another greenhouse gas (e.g., CH₄ and N₂O). Conversion factors to CO_{2e} are 21 for CH₄ and 310 for N₂O.

Deepwater Horizon MC252 Oil Spill

General Impacts on Fishery Resources

The presence of polycyclic aromatic hydrocarbons (PAH), which are highly toxic chemicals that tend to persist in the environment for long periods of time, in marine environments can have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2011). When exposed to realistic, yet toxic levels of PAHs (1–15 µg/L), greater amberjack larvae develop cardiac abnormalities and physiological defects (Incardona et al. 2014). The future reproductive success of long-lived species, including red drum (*Sciaenops ocellatus*) and many reef fish species, may be negatively affected by episodic events resulting in high-mortality years or low recruitment. These episodic events could leave gaps in the age structure of the population, thereby affecting future reproductive output (Mendelssohn et al. 2012). Other studies have described the vulnerabilities of various marine finfish species, with morphological and/or life history characteristics similar to species found in the Gulf, to oil spills and dispersants (Hose et al. 1996; Carls et al. 1999; Heintz et al. 1999; Short 2003).

Increases in histopathological lesions were found in red snapper (*Lutjanus campechanus*) in the area affected by the oil, but Murawski et al. (2014) found that the incidence of lesions had declined between 2011 and 2012. The occurrence of such lesions in marine fish is not uncommon (Sindermann 1979; Haensly et al. 1982; Solangi and Overstreet 1982; Khan and Kiceniuk 1984, 1988; Kiceniuk and Khan 1987; Khan 1990). Red snapper diet was also affected after the spill. A decrease in zooplankton consumed, especially by adults (greater than 400 mm total length) over natural and artificial substrates may have contributed to an increase in the consumption of fish and invertebrate prey – more so at artificial reefs than natural reefs (Tarnecki and Patterson 2015).

In addition to the crude oil, over a million gallons of the dispersant, Corexit 9500A[®], was applied to the ocean surface and an additional hundreds of thousands of gallons of dispersant was pumped to the mile-deep well head (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted until the *Deepwater Horizon MC252* oil spill. Thus, no data exist on the environmental fate of dispersants in deep water. The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern. Marine fish species typically concentrate PAHs in the digestive tract, making stomach bile an appropriate testing medium. A study by Synder et al. (2015) assessed bile samples from golden tilefish (*Lopholatilus chamaeleonticeps*), king snake eel (*Ophichthus rex*), and red snapper for PAH accumulation over time, and reported concentrations were highest in golden tilefish during the same time period when compared to king snake eel and red snapper. These results suggest that the more highly associated an organism is with the sediment in an oil spill area, the higher the likelihood of toxic PAH accumulation. Twenty-first century dispersant applications are thought to be less harmful than their predecessors. However, the combination of oil and dispersants has proven to be more toxic to marine fishes than either dispersants or crude oil alone. Marine fish which are more active (e.g., a pelagic species versus a demersal species) appear to be more susceptible to negative effects from interactions with weathered oil/dispersant emulsions. These effects can include mobility impairment and inhibited respiration (Swedmark et al. 1973). Another study found that while Corexit 9500A[®] and oil are similar in their toxicity, when Corexit 9500A[®] and oil were mixed in lab tests, toxicity to microscopic rotifers increased up to 52-fold (Rico-Martínez et al. 2013). These studies suggest that the toxicity of the oil and dispersant combined may be greater than anticipated.

As reported by NOAA's Office of Response and Restoration (NOAA 2010), the oil from the *Deepwater Horizon MC252* spill is relatively high in alkanes, which can readily be used by microorganisms as a food source (Figure 3.2.2.1). As a result, the oil from this spill is likely to biodegrade more readily than crude oil in general. The *Deepwater Horizon MC252* oil is also relatively much lower in PAH, especially if the spilled oil penetrates into the substrate on beaches or shorelines. Like all crude oils, MC252 oil contains volatile organic compounds (VOCs) such as benzene, toluene, and xylene. Some VOCs are acutely toxic but because they evaporate readily, they are generally a concern only when oil is fresh.¹⁰

Outstanding Effects

As a result of the *Deepwater Horizon MC252* oil spill, a consultation pursuant to ESA Section 7(a)(2) was reinitiated. As discussed above, on September 30, 2011, the Protected Resources Division released an 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 spill 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 2011). More information is available on the *Deepwater Horizon MC252* oil spill and associated closures is available on the Southeast Regional Office website¹¹.

¹⁰ http://sero.nmfs.noaa.gov/deepwater_horizon/documents/pdfs/fact_sheets/oil_characteristics.pdf

¹¹ http://sero.nmfs.noaa.gov/deepwater_horizon_oil_spill.htm

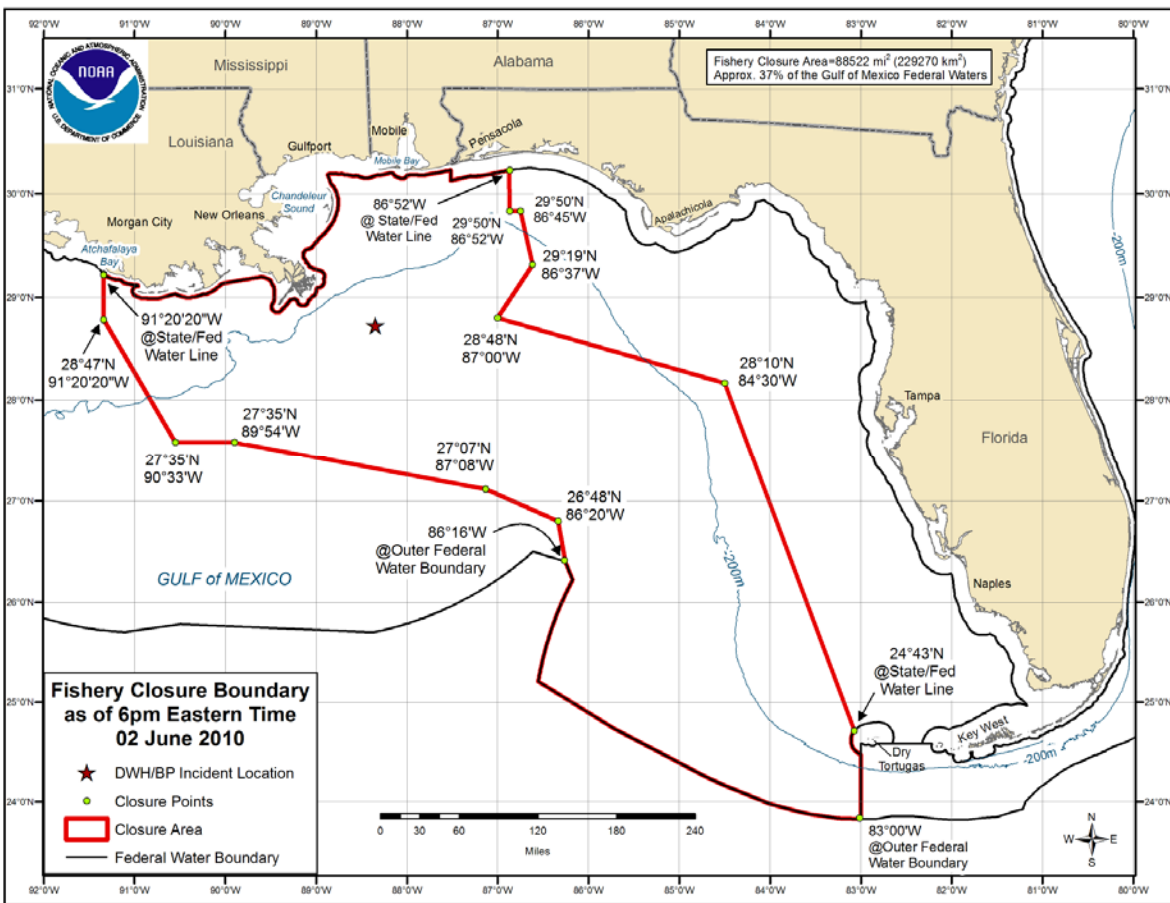


Figure 3.2.2.1. Fishery closure at the height of the *Deepwater Horizon* MC252 oil spill.

3.3 Description of the Economic Environment

3.3.1 Commercial Sector

A description of the red snapper individual fishing quota program can be found on NMFS' Limited Access Privilege Programs (LAPP) webpage.¹² That description is incorporated herein by reference. Additional economic information on the commercial harvest of red snapper in the Gulf is contained in Amendment 28 (GMFMC 2015a). This proposed amendment does not concern the commercial harvest of red snapper or any other reef fish. Therefore, no additional information on the commercial sector is provided.

3.3.2 Recreational Sector

The following section focuses on the economic contribution of the recreational effort and harvest of red snapper. Recreational fishing for red snapper or any Gulf reef fish means fishing or

¹² http://sero.nmfs.noaa.gov/sustainable_fisheries/lapp_dm/index.html

fishing activities which result in the harvest of fish, none of which (or parts thereof) is sold, traded, or bartered (50 CFR 622.2).

In 2014, Amendment 40 divided the recreational sector of harvesting red snapper from federal waters into two parts based on the mode of transportation that anglers use to fish for red snapper in those waters: federal for-hire (vessel) and private (vessel) angling components (GMFMC 2014a). The for-hire component applies to businesses that operate vessels that have been issued a federal Gulf reef fish for-hire permit during any time of the fishing year. These permits may be valid or renewable/transferrable; however, the vessel must have a valid permit for any person onboard to fish for or possess Gulf red snapper in federal waters (50 CFR 622.20(b)).

The private angling component applies to vessel operators that have not been issued a federal charter/headboat permit for Gulf reef fish any time during the year. Amendment 40 defined the private angling component as including operators of private vessels and state-permitted for-hire vessels. Although vessels used by these operators may have multiple purposes (commercial, for-hire, and personal), trips involving and landings of red snapper by this component of the recreational sector occur only when the vessels are not operating as a business in federal waters. Additional information about the recreational sector of the reef fish fishery can be found in Amendment 45 (GMFMC 2016).

Federal For-Hire Component

An annual average of 1,329 Gulf vessels had a valid or renewable federal charter/headboat permit from 2012 through 2016 (Table 3.3.2.1). The distribution of vessels with the permit by hailing port state changed little from 2012 through 2016 (Table 3.3.2.2).

Table 3.3.2.1. Number and percentage of charter/headboat permits for reef fish by state of hailing port of vessel, 2012-2016.

Year	For-Hire Reef Fish Permits by Hailing Port of Vessel						
	2012	2013	2014	2015	2016	Average	Percent Change 2012-2016
AL	157	159	153	143	134	149	-14.7%
FL	812	803	787	778	776	791	-4.4%
LA	123	120	117	121	119	120	-3.3%
MS	48	47	42	38	35	42	-27.1%
TX	221	219	230	232	232	227	5.00%
Gulf States	1,361	1,348	1,329	1,312	1,296	1,329	-4.8%
Other	17	15	16	16	18	16	5.9%
Total	1,378	1,363	1,345	1,328	1,314	1,346	-4.6%

Source: NMFS Southeast Regional Office (SERO).

Table 3.3.2.2. Percentage of for-hire reef fish permits by state of hailing port of vessel.

Year	Percentage of Charter/Headboat Reef Fish Permits						Change 2012-2016
	2012	2013	2014	2015	2016	Average	
AL	11.4%	11.7%	11.4%	10.8%	10.2%	11.1%	-1.2%
FL	58.9%	58.9%	58.5%	58.6%	59.1%	58.8%	0.1%
LA	8.9%	8.8%	8.7%	9.1%	9.1%	8.9%	0.1%
MS	3.5%	3.5%	3.1%	2.9%	2.7%	3.1%	-0.8%
TX	16.0%	16.1%	17.1%	17.5%	17.7%	16.9%	1.6%
Gulf States	98.8%	98.9%	98.8%	98.8%	98.6%	98.8%	-0.1%
Other	1.2%	1.1%	1.2%	1.2%	1.4%	1.2%	0.1%
Total	100%	100%	100%	100%	100%	100%	

Source: NMFS SERO.

As of October 24, 2017, there were 1,313 for-hire fishing vessels with the permit, and approximately 84% of those vessels have a passenger capacity of six (Table 3.3.2.3). Among the vessels with a homeport in one of the Gulf states, Alabama has the largest average federally permitted for-hire vessel by passenger capacity, while Louisiana has the smallest (Table 3.3.2.4). Although the average Florida vessel is not the largest, Florida's combined permitted vessels represent approximately 61% of the total passenger capacity (Table 3.3.2.4). Approximately 98% of Louisiana's permitted vessels carry up to six passengers (Table 3.3.2.5).

Table 3.3.2.3. Number and percentage of permitted for-hire fishing vessels by passenger capacity as of October 24, 2017.

Passenger Capacity	Vessels	
	Number	Percentage
6	1,107	84.38%
7 to 10	6	0.46%
11 - 14	14	1.07%
15 - 20	53	4.04%
21 - 25	25	1.91%
26 - 30	11	0.84%
31 - 40	16	1.22%
41 - 50	34	2.59%
51 - 80	22	1.68%
> 80	24	1.83%
Total	1,312	100.00%

Source: NMFS SERO LAPPS.

Table 3.3.2.4. Range, average, median, total and percent of total passenger capacity by homeport state of vessels as of October 24, 2017.

Homeport State	Passenger Capacity				
	Range	Average	Median	Total	Percentage of Total
AL	6 - 75	13	6	1,736	11.6%
FL	6 - 150	12	6	9,052	60.6%
LA	6 - 41	6	6	768	5.1%
MS	6 - 44	10	6	354	2.4%
TX	6 - 132	11	6	2,659	17.8%
Other	6 - 149	22	6	376	2.5%
All	6 - 150	11	6	14,945	100.0%

Source: NMFS SERO LAPPS.

Table 3.3.2.5. Number of permitted vessels by passenger capacity and homeport state as of October 24, 2017.

Homeport State	Number of Vessels by Passenger Capacity				Percentage of Vessels*	
	6	7 - 14	15 and greater	Total	6	15 and greater
AL	100	0	36	136	73.5%	26.5%
FL	642	20	112	774	82.9%	14.5%
LA	117	0	2	119	98.3%	1.7%
MS	26	0	8	34	76.5%	23.5%
TX	209	0	23	232	90.1%	9.9%
Other	13	0	4	17	76.5%	23.5%
All	1,107	20	185	1,312	84.4%	14.1%

*: Does not include percentage of vessels with passenger capacity of 7 to 14.

Source: NMFS SERO LAPPS.

Permit data as of October 25, 2017, were used to estimate both the number of businesses with a charter/headboat permit and the sizes of their individual fleets of permitted for-hire vessels. As of that date, there were 1,308 permitted for-hire fishing vessels¹³, and an estimated 1,099 businesses own these 1,308 vessels. Approximately 88% (972) of the businesses have only one permitted for-hire vessel (Table 3.3.2.6). Collectively, the other 12% of businesses own 26% (336) of the permitted for-hire vessels. Seven businesses collectively own approximately 4.2% of the permitted vessels.

¹³ The decline from 1,312 to 1,308 federally permitted for-hire vessels in one day is expected to be due to permits being terminated and/or having status as pending and, as pending, permits are not valid or renewable/transferrable. When an application for renewal of an expired permit is submitted but does not include all required documentation, the status of the permit is pending.

Table 3.3.2.6. Numbers and percentages of businesses and total permitted for-hire vessels by number of permitted for-hire fishing vessels per business, October 25, 2017.

Permitted Vessels per Business	Number of Business	Total Number of Permitted Vessels	Percentage of Businesses	Percentage of Total Permitted Vessels
1	972	972	88.1%	74.3%
2	87	174	7.9%	13.3%
3	25	75	2.3%	5.7%
4	8	32	0.7%	2.5%
5	4	20	0.4%	1.5%
6 or more	3	35	0.3%	2.7%
All	1,099	1,308	100.0%	100.0%

Source: NMFS SERO, October 26, 2017.

When operating under the for-hire permit, these businesses participate in the charter fishing and party fishing boats industry (North American Industry Classification System [NAICS] code 4872102). The U.S. Census Bureau conducts the Economic Census of the United States every 5 years, which surveys businesses with employees. Over the past four economic censuses, there was an average of 323 employee establishments in the charter fishing and party fishing boats industry in the Gulf states (Table 3.3.2.7).

Table 3.3.2.7. Number of employer establishments in NAICS code 4872012 (charter fishing and party fishing boats industry).

State	Number of Establishments				
	1997	2002	2007	2012	Average
Alabama	21	18	22	22	21
Florida	249	237	259	259	251
Louisiana	13	11	12	9	11
Mississippi	9	12	7	11	10
Texas	36	32	27	24	30
Total	328	310	327	325	323

Source: 1997, 2002, 2007, 2012 Economic Census of the United States.

The Economic Census can be used to estimate the average annual receipts for employer establishments in an industry, and the average establishment in the charter fishing and party fishing boats industry in any of the Gulf states had annual receipts less than \$600,000 in 2012 (Table 3.3.2.8). Each establishment does not necessarily represent a unique business; a business may have multiple establishments.

Table 3.3.2.8. Number of establishments, total receipts and average receipts establishments in NAICS code 4872012 in 2012.

State	2012 Establishments	2012 Receipts	
		Total	Average
Alabama	22	\$5,163,000	\$234,682
Florida	259	\$74,785,000	\$288,745
Louisiana	9	\$4,819,000	\$535,444
Mississippi	11	Undisclosed	\$192,143*
Texas	24	\$13,293,000	\$553,875

*Estimate from total receipts for all establishments in NAICS code 487210.

Source: 2012 Economic Census of the United States.

The employee establishments in the charter fishing and party fishing boats industry represent part of the broader scenic and sightseeing water transportation industry (NAICS code 487210), and tend to represent the majority of employer establishments in the broader industry, except in Louisiana where there are more establishments in the excursion and sightseeing boats industry (NAICS code 4872011) (Table 3.3.2.9). Average receipts for establishments in the excursion and sightseeing boats industry tend to be higher than those for establishments in the charter fishing and party fishing boats industry. In Texas, for example, the average receipts for an establishment in the excursion and sightseeing boats industry in 2012 was approximately 59% larger than for an establishment in the charter fishing and party fishing boats industry. It is expected that there are vessels in the for-hire component that are also used for excursions and sightseeing.

Table 3.3.2.9. Percentage of employer establishments in NAICS code 487210 that are in the charter fishing and party fishing boats industry.

State	Percentage of Establishments in Charter and Party Fishing Boat Industry				
	1997	2002	2007	2012	Average
Alabama	77.8%	72.0%	75.9%	73.3%	74.7%
Florida	69.2%	66.0%	64.1%	58.6%	64.5%
Louisiana	33.3%	36.7%	48.0%	32.1%	37.5%
Mississippi	100.0%	80.0%	87.5%	84.6%	88.0%
Texas	70.6%	58.2%	47.4%	48.0%	56.0%
Total	67.5%	64.0%	62.5%	57.7%	62.9%

Source: 1997, 2002, 2007, 2012 Economic Census of the United States.

The U.S. Census surveys non-employer businesses as well; however, non-employer statistics are not publically available at the relevant 6- or 7-digit NAICS code level. In 2015, there were 1,528 non-employer establishments in the scenic and sightseeing (water and land) transportation industry (NAICS code 487) in the Gulf states, and most (approximately 81%) were individual (or sole) proprietorships (Table 3.3.2.10). Self-employed individuals are included in the individual proprietorship category.

Table 3.3.2.10. Number of establishments by legal form in the scenic and sightseeing transportation industry (NAICS code 487), 2015.

State	C-corporations	S-corporations	Individual proprietorships	Partnerships	Total
Alabama		7	62		71
Florida	20	130	728	69	947
Louisiana		10	151	8	169
Mississippi		5	44	5	54
Texas	6	17	248	16	287
Total	26	169	1,233	98	1,528

Source: Census, 2015 Non-employer Statistics by Legal Form.

For the purpose of this and related documents, charter vessels and headboats are differentiated by passenger capacity and the method passengers pay. Specifically, a headboat is defined as a federally permitted for-hire vessel that participates in the SRHS, and a vessel in the SRHS meets all or a combination of the following criteria: 1) is licensed to carry 15 or more passengers, 2) fishes in federal waters or state and adjoining waters for federally managed species, and 3) charges primarily per angler (by the head). A charter vessel is defined as a federally permitted for-hire fishing vessel that does not participate in the SRHS.

There were annual averages of 68 headboats and 1,277 charter vessels from 2012 through 2016 (Table 3.3.2.11). Headboats tend to represent approximately 5% of those federally permitted vessels. See Section 3.4.1 and Figures 3.4.1.2 and 3.4.1.3 for the distribution of charter vessels and headboats by state.

Table 3.3.2.11. Number of headboats and charter vessels, 2012 - 2016.

Year	Federally Permitted Charter/Headboats			Percent Headboat
	Headboats	Charter	Total	
2012	68	1,310	1,378	4.9%
2013	68	1,295	1,363	5.0%
2014	68	1,277	1,345	5.1%
2015	68	1,260	1,328	5.1%
2016	69	1,245	1,314	5.3%
Average	68	1,277	1,346	5.1%

Source: SRHS, SERO LAPPs/Data Management database.

Data from Marine Recreational Information Program (MRIP) and the Louisiana and Texas creel surveys are used to generate estimates of effort of the charter vessel component. From 2012 through 2016, charter vessels took an average of 201,348 directed angler trips annually (Table 3.3.2.12). These are trips when red snapper was the primary or secondary target species or was caught by anglers. Approximately 60% of the annual directed angler trips by charter vessels are out of west Florida.

Table 3.3.2.12. Estimates of numbers of directed angler trips by for-hire component by state and percentage of total by Alabama and west Florida, 2012 - 2016.

Year	Estimates of Number of Directed Angler Trips					
	AL	West FL	LA	MS	TX	Total
2012	34,459	115,928	11,353	652	29,323	191,715
2013	42,438	110,782	9,077	552	25,652	188,501
2014	29,277	90,991	3,111	292	20,055	143,726
2015	52,417	140,881	8,849	908	32,885	235,940
2016	57,108	146,847	10,317	2,001	30,585	246,858
Average	43,140	121,086	8,541	881	27,700	201,348

Source: NMFS SERO LAPPS, August 28, 2017.

Directed angler trips by charter vessels generate jobs and other economic impacts. For example, the average annual 121,086 directed trips by west Florida charter vessels generate 631 jobs, approximately \$28 million in income, \$77.9 million in sales, and \$43 million in value-added impacts in Florida (Table 3.3.2.13).

Table 3.3.2.13. Estimates of economic impacts of directed angler trips by charter boats and their economic impacts to the state, by state.

State	Directed Trips	Jobs	Thousands of Dollars (2015 \$)		
			Income	Sales	Value-added
AL	43,140	221	\$9,208	\$25,828	\$13,486
West FL	121,086	631	\$28,043	\$77,865	\$42,960
LA	8,541	31	\$1,764	\$4,543	\$2,621
MS	881	3	\$136	\$394	\$196

Source: Estimates of economic impacts calculated by NMFS SERO using model developed for NMFS, see http://sero.nmfs.noaa.gov/sustainable_fisheries/lapp_dm/index.html.

There is insufficient information to estimate the economic impacts of the directed trips made by Texas charter vessels to the state of Texas. However, the impacts of the trips by Texas charter vessels are evaluated at the Gulf region level (Table 3.3.2.14).

Table 3.3.2.14. Estimates of economic impacts of directed angler trips by Texas charter vessels to the Gulf region.

State	Directed Trips	Jobs	Thousands of Dollars (2015 \$)		
			Income	Sales	Value-added
Texas	27,700	172	\$8,585	\$24,838	\$13,308

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

Similar analysis of recreational effort is not possible for headboats because headboat trip data are not collected at the individual angler level, but instead at the vessel level, and target intent is not included, only species caught and landed. The length of a headboat trip varies considerably,

from three to five and a half hours (half a day) to 10 hours or more; however, the majority of trips are no more than six hours and no more than approximately 3% are 10 hours or more (Tables 3.3.2.15 and 3.3.2.16). The USCG requires a vessel that makes a trip over 12 hours long to have two captains and two deckhands, which increases the cost of a trip. Also, if overnight, a headboat will have fewer paying passengers on board because passengers need space to sleep or at least lay down.

Table 3.3.2.15. Number of annual headboat trips by length (hours) of trip, 2012 – 2016.

Year	Number of Vessels	3 – 5.5 Hours	6 Hours	8 to 9.5 Hours	10 or more Hours	Total
2012	68	3,200	4,032	1,219	234	8,685
2013	68	2,902	2,363	3,316	243	8,824
2014	68	3,281	2,260	3,343	275	9,159
2015	68	3,649	2,265	3,499	313	9,726
2016	69	3,757	2,483	3,544	298	10,082
Average	68	3,358	2,681	2,984	273	9,295

Source: NMFS SEFSC.

Table 3.3.2.16. Percentage of annual headboat trips by length of trip, 2012 – 2016.

Year	Percentage of Headboat Trips				
	Half Day	Three-quarter Day	Full Day	More than Full Day	Total
2012	36.8%	46.4%	14.0%	2.7%	100.0%
2013	32.9%	26.8%	37.6%	2.8%	100.0%
2014	35.8%	24.7%	36.5%	3.0%	100.0%
2015	37.5%	23.3%	36.0%	3.2%	100.0%
2016	37.3%	24.6%	35.2%	3.0%	100.0%
Average	36.1%	29.2%	31.8%	2.9%	100.0%

Source: NMFS SEFSC.

Estimates of effort by headboats are provided in terms of angler days, or the number of standardized 12-hour fishing days that account for the different half, three-quarter, full-day and longer fishing trips by these vessels. For purposes of estimating angler days and landings, the SRHS divides the Gulf into several geographic areas.

The distribution of angler days by geographic area is presented in Table 3.3.2.17. On average, from 2012 through 2016, the area from the Dry Tortugas through the Florida Middle Grounds (FLW) accounted for the largest number of angler days, followed in turn by northwest Florida through Alabama, Texas and Mississippi through Louisiana (Tables 3.3.2.17 and 3.3.2.18).

Table 3.3.2.17. Number of angler days by area, 2012 – 2016.

Year	Number of Angler Days				
	FLW	NWFL-AL ¹	MS-LA ²	TX	Total
2012	84,205	77,770	3,680	51,776	217,431
2013	94,752	80,048	3,406	55,749	233,955
2014	102,841	88,524	3,257	51,231	245,853
2015	107,910	86,473	3,587	55,135	253,105
2016	109,101	90,877	2,955	54,083	257,016
Average	99,762	84,738	3,377	53,595	241,472

Source: SERO SRHS.

1. Beginning in 2013, SRHS data was reported separately for NW Florida and Alabama, but has been combined here for consistency with previous years.

2. Combined for confidentiality purposes.

Table 3.3.2.18. Percentages of total angler days by area, 2012 – 2016.

Year	Percentage of Total Angler Days				
	FLW	NWFL-AL ¹	MS-LA ²	TX	Total
2012	38.7%	35.8%	1.7%	23.8%	100.0%
2013	40.5%	34.2%	1.5%	23.8%	100.0%
2014	41.8%	36.0%	1.3%	20.8%	100.0%
2015	42.6%	34.2%	1.4%	21.8%	100.0%
2016	42.4%	35.4%	1.1%	21.0%	100.0%
Average	41.2%	35.1%	1.4%	22.3%	100.0%

Source: SERO SRHS.

1. Beginning in 2013, SRHS data was reported separately for NW Florida and Alabama, but has been combined here for consistency with previous years.

2. Combined for confidentiality purposes.

Fifty-eight of the 69 headboats in 2016 had red snapper landings (SEFSC SRHS). The majority of these headboats with red snapper landings are registered in Florida, with smaller numbers of vessels registered in the other Gulf states (Table 3.3.2.19).

Table 3.3.2.19. Number and percentage of headboats with red snapper landings in 2016 by state.

Headboats with Red Snapper Landings				
AL	FL	MS& LA ¹	TX	Total
8	30	5	15	58
13.79%	51.72%	8.62%	25.86%	100.00%

Source: SERO SRHS 2016.

1. Combined for confidentiality purposes.

Because SRHS data do not identify species that are targeted during a trip, the economic impacts of headboat trips that may target red snapper cannot be estimated. For estimates of the average

fee per angler charged by headboats, see Carter (2015, 2016); for species targeted by the for-hire component, see Savolainen et al. (2012); and for estimates of producer surplus, see Amendment 45 (GMFMC 2016), all of which are incorporated by reference.

Private Angling Component

Angler fishing effort refers to the estimated number of angler fishing trips taken, and an angler trip is an individual fishing trip taken by a single angler for any amount of time, whether it is half an hour or an entire day. Currently, angler fishing effort is estimated by conducting telephone surveys of coastal households (Coastal Household Telephone Survey) and for-hire (charter) vessel captains (For-Hire Survey), as well as on-site survey methods (MRIP Access Point Angler Intercept Survey [APAIS]). From these survey interviews, NMFS can estimate how many people are fishing, where people are fishing, and how often people go fishing. Moreover, with the MRIP APAIS (survey of anglers by the private boat, charter vessel and shore modes as they complete a trip), NMFS can estimate how many trips target red snapper, how many trips catch red snapper and how many are being caught, how many red snapper are kept, how many are discarded, the condition of discarded fish, and the size and weight of red snapper caught.

Data from MRIP and LA Creel are used to estimate effort of the private angling component for each Gulf state, except Texas. From 2012 through 2016, the private angling component of the recreational sector took an average of at least 228,122 directed angler trips annually (Table 3.3.2.20). Those were trips where red snapper was the primary or secondary target or was caught or harvested by anglers. Alabama has the largest number of average annual trips, with west Florida second during the 5-year period.

Table 3.3.2.20. Estimates of numbers of directed angler trips by private angling component, 2012 – 2016.

Year	Estimates of Number of Directed Angler Trips					
	AL	FLW	LA	MS	TX	Total
2012	51,794	77,457	38,413	13,515	0	181,179
2013	176,719	166,239	31,049	19,478	0	393,485
2014	46,909	50,415	60,146	3,433	0	160,903
2015	99,446	11,194	53,165	2,641	0	166,446
2016	124,091	51,488	43,571	19,446	0	238,596
Average	99,792	71,359	45,269	11,703	0	228,122

Source: NMFS SERO LAPPS, August 28, 2017.

Directed angler trips generate economic impacts and the average annual directed angler trips by the private angling component generated income impacts annually (Table 3.3.2.21). Annual landings of red snapper by the private angling and for-hire components for 2012 – 2016 are summarized in Table 3.3.2.22.

Table 3.3.2.21. Economic impacts of average number of annual directed angler trips by private angling component in Gulf states, except Texas (2015 dollars).

State	Directed Trips	Jobs	Thousands of Dollars (2015 \$)		
			Income	Sales	Value-added
AL	99,792	53	\$1,588	\$5,281	\$2,734
West FL	71,359	24	\$901	\$2,621	\$1,553
LA	45,269	23	\$852	\$3,249	\$1,577
MS	11,703	3	\$97	\$375	\$163

Source: Estimates of economic impacts calculated by NMFS SERO using model developed for NMFS, see http://sero.nmfs.noaa.gov/sustainable_fisheries/lapp_dm/index.html.

Table 3.3.2.22. Recent for-hire and private angling landings for red snapper by component and state from 2012-2016.

State	2012 Landings (lbs whole weight)			% by State
	For-Hire Charter/Headboat	Private Angling	All Components	
FL (west)	1,025,320	1,420,620	2,445,940	32.5%
AL	503,927	2,197,377	2,701,304	35.9%
MS	7,300	306,854	314,154	4.2%
LA	257,344	1,188,763	1,446,106	19.2%
TX	445,429	171,308	616,737	8.2%
Total	2,239,320	5,284,921	7,524,241	
% by Mode	30%	70%		

State	2013 Landings (lbs whole weight)			% by State
	For-Hire Charter/Headboat	Private Angling	All Components	
FL (west)	671,642	3,105,730	3,777,372	38.9%
AL	546,564	3,877,683	4,424,247	45.6%
MS	3,792	418,737	422,529	4.4%
LA	100,438	489,204	589,642	6.1%
TX	234,549	254,563	489,112	5.0%
Total	1,556,985	8,145,917	9,702,902	
% by Mode	16%	84%		

Table 3.3.2.22 *continued*. Recent for-hire and private angling landings for red snapper by component and state from 2012-2016.

State	2014 Landings (lbs whole weight)			% by State
	For-Hire Charter/Headboat	Private Angling	All Components	
FL (west)	184,957	1,459,885	1,644,841	42.9%
AL	152,614	1,006,166	1,158,780	30.2%
MS	1,693	43,425	45,118	1.2%
LA	33,909	557,189	591,098	15.4%
TX	193,705	201,894	395,599	10.3%
Total	566,878	3,268,558	3,835,436	
% by Mode	15%	85%		

State	2015 Landings (lbs whole weight)			% by State
	For-Hire Charter/Headboat	Private Angling	All Components	
FL (west)	865,058	766,237	1,631,295	27.4%
AL	757,388	1,711,421	2,468,809	41.4%
MS	10,485	34,209	44,694	0.7%
LA	155,669	1,059,302	1,214,971	20.4%
TX	365,077	235,305	600,382	10.1%
Total	2,153,677	3,806,474	5,960,151	
% by Mode	36%	64%		

State	2016 Landings (lbs whole weight)			% by State
	For-Hire Charter/Headboat	Private Angling	All Components	
FL (west)	822,599	1,713,799	2,536,397	34.1%
AL	763,511	2,047,404	2,810,915	37.8%
MS	18,721	354,645	373,366	5.0%
LA	179,586	1,042,389	1,221,975	16.4%
TX	358,399	135,398	493,797	6.6%
Total	2,142,815	5,293,635	7,436,450	
% by Mode	29%	71%		

Source: Southeast Fisheries Science Center (SEFSC) MRIP-Based Recreational ACL Data (July 2017); SEFSC SEDAR-31 Update (2014) APAIS-adjusted red snapper data.

Additional information about the private angling component can be found in Amendments 40 (GMFMC 2014a), 28 (GMFMC 2015b), and 45 (GMFMC 2016), and are incorporated by reference.

3.4 Description of the Social Environment

This framework action affects recreational management of red snapper in the Gulf. Recreational landings by state, federally permitted for-hire vessels by state, and federal for-hire vessels included in the SRHS with landings of red snapper by state, are included to provide information on the geographic distribution of fishing involvement. Descriptions of the top recreational fishing communities based on recreational engagement are included, along with the top ranking communities by the number of federal for-hire permits, and communities with SRHS landings of red snapper. Community level data are presented in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which requires the consideration of the importance of fishery resources to human communities when changes to fishing regulations are considered. Lastly, social vulnerability data are presented to assess the potential for environmental justice concerns.

3.4.1 Fishing Communities

Red snapper is harvested recreationally in all five Gulf states. Landings by state are not constant; the proportion of the quota represented by each state varies from year to year. For the years 2013-2017, the majority of recreational landings of red snapper are from waters adjacent to Alabama (range of 30.2% to 45.6%) and western Florida (range of 27.4% to 42.9%), followed by Louisiana (range of 6.1% to 20.4%), Texas (range of 5% to 10.3%), and Mississippi (range of 0.7% to 5%, SEFSC Recreational ACL Dataset).

Recreational Fishing Communities

Landings for the recreational sector are not available by species at the community level, making it difficult to identify communities as dependent on recreational fishing for red snapper. Because limited data are available concerning how recreational fishing communities are engaged and reliant on specific species, indices were created using secondary data from permit and infrastructure information for the southeast recreational fishing sector at the community level (Jepson and Colburn 2013, Jacob et al. 2013). Recreational fishing engagement is represented by the number of recreational permits and vessels designated as “recreational” by homeport and owners address. Fishing reliance includes the same variables as fishing engagement, divided by population. Factor scores of both engagement and reliance were plotted by community.

Figure 3.4.1.1 identifies the top Gulf communities that are engaged and reliant upon recreational fishing in general. Two thresholds of one and one-half standard deviation above the mean were plotted to help determine a threshold for significance. Communities are presented in ranked order by fishing engagement and all 20 included communities demonstrate high levels of recreational engagement, although this is not specific to fishing for red snapper. 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 20 list suggesting a greater importance for recreational fishing in that area.

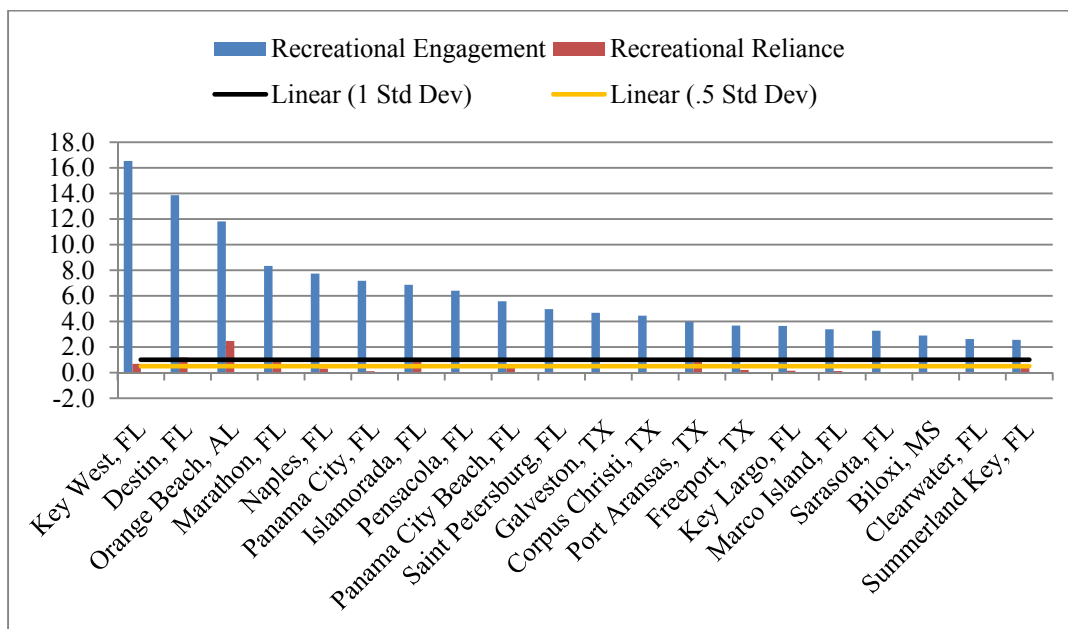


Figure 3.4.1.1. Top 20 recreational fishing communities' engagement and reliance.

Source: SERO, Community Social Vulnerability Indicators Database 2016 (ACS 2010-2014).

Charter Vessels and Headboats by Community

In order to present information about the charter vessels and headboats that are engaged in recreational fishing for red snapper, all vessels with a federal for-hire permit for reef fish, including historical captain permits, are included in the following analysis. However, it cannot be assumed that every included permitted vessel is engaged in red snapper fishing.

The majority of federal for-hire permits for reef fish are held by operators in Florida (60% in 2017), followed by Texas (16%), Alabama (11%), Louisiana (9%), Mississippi (3%), and other states (1%; NMFS SERO permit database). The distribution of permits by state has followed a similar pattern throughout the last five years.

Federal for-hire permits are held by those with mailing addresses in a total of 364 communities, located in 23 states (NMFS SERO permit office, July 22, 2018). The communities with the most for-hire permits for reef fish are provided in Table 3.4.1.1.

Table 3.4.1.1. Top ranking communities based on the number of federal for-hire permits for Gulf reef fish, including historical captain permits, in descending order.

State	Community	Permits
FL	Destin	67
AL	Orange Beach	51
FL	Panama City	51
FL	Naples	46
FL	Key West	42
FL	Pensacola	26
TX	Galveston	23
FL	St. Petersburg	22
FL	Sarasota	20
FL	Cape Coral	17
FL	Clearwater	17
FL	Fort Myers	17
LA	Metairie	17
TX	Houston	17
FL	Panama City Beach	15
MS	Biloxi	15
TX	Port Aransas	15
FL	Marco Island	14
TX	Freeport	14

Source: NMFS SERO permit office, July 22, 2018.

When Gulf reef fish for-hire vessels are separated into charter vessels or headboats, the majority are charter vessels (95% of for-hire vessels as of September 20, 2016) and a smaller proportion are headboats (approximately 5%, NMFS SERO permit office).

Charter vessels and headboats target red snapper throughout the Gulf. At this time it is not possible to determine which species are targeted by specific charter vessels and associate those vessels with their homeport communities. However, harvest data are available for headboats by species and can be linked to specific communities through the homeport identified for each vessel. These data are available for headboats registered in the SRHS.

In 2016, 69 federal for-hire vessels in the Gulf were registered in the SRHS (SRHS, SERO LAPPs/Data Management database). Of these, 57 vessels landed red snapper in 2016 (SEFSC SRHS). The majority of these headboats with red snapper landings are registered in Florida (approximately 49%), with smaller numbers of vessels registered in Texas (26%), Alabama (16%), and Louisiana and Mississippi (9%, SEFSC SRHS 2016).

Figure 3.4.1.2 includes all Gulf communities with SRHS landings of red snapper based on a ‘regional quotient’ (RQ) of recreational headboat landings for red snapper. The RQ is the

proportion of landings out of the total SRHS landings for that region, and is a relative measure. The top four homeports represent about 73% of the red snapper landings by vessels participating in the SRHS. Homeports with the greatest landings of red snapper include Galveston, Texas (27.2% of red snapper landed by SRHS vessels in 2016); Port Aransas, Texas (23.5%); Panama City Beach, Florida (11.4%); and Orange Beach, Alabama (10.5%; SEFSC SRHS 2016). It is likely that communities with substantial headboat landings of red snapper would also have strong participation by charter vessels and private anglers.

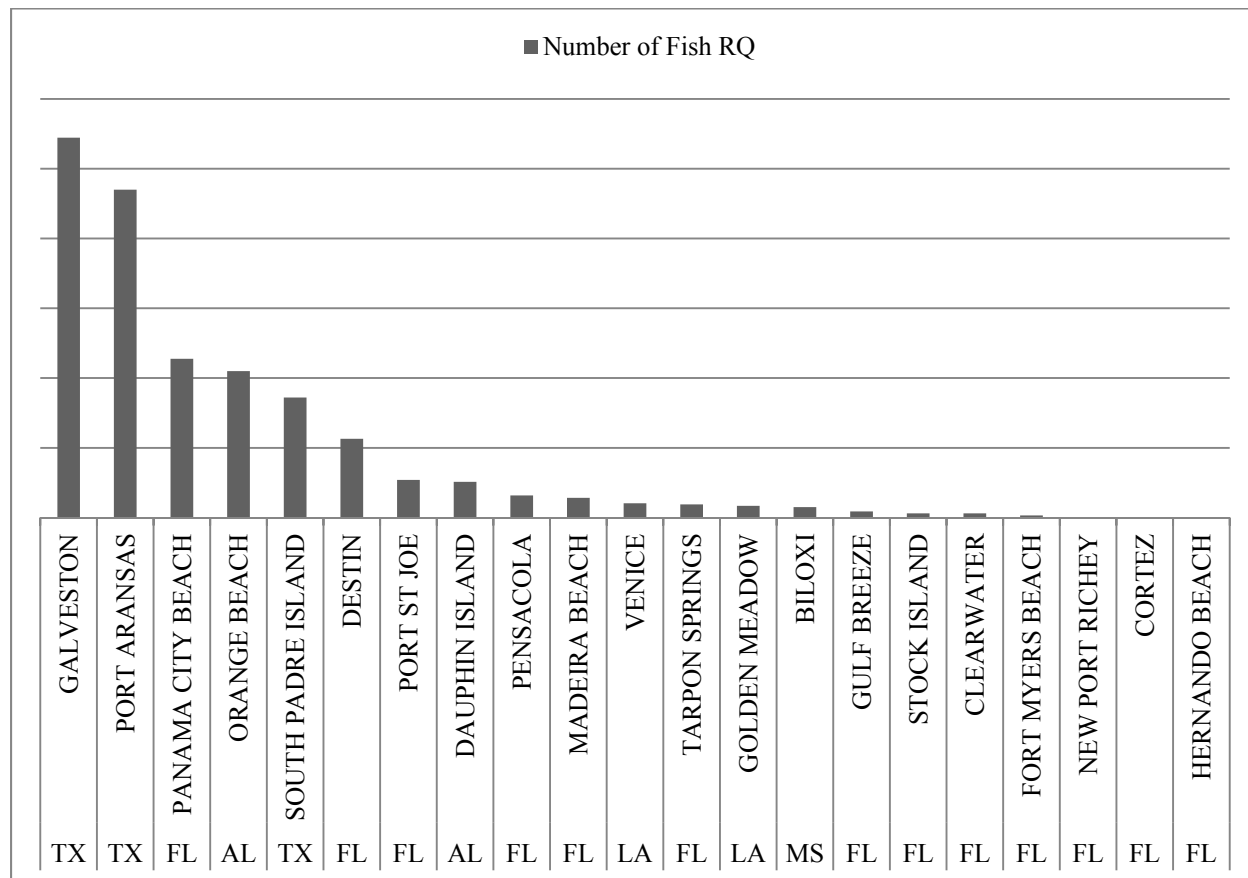


Figure 3.4.1.2. All Gulf communities ranked by number of fish landed by headboats included in the SRHS RQ for red snapper. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.

Source: SEFSC SRHS (2016).

3.4.2 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).

Recreational fishermen and associated industries could be impacted by the proposed actions. However, information on the race and income status for groups at the different participation levels 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 EJ concerns arise from the actions in this amendment, a suite of indices were created to examine the social vulnerability of coastal communities. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community’s vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and households with children under the age of five, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of populations experiencing vulnerabilities. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Figures 3.4.2.1 and 3.4.2.2 provide the social vulnerability of the top recreational communities. One community exceeds the threshold of one standard deviation above the mean for all three indices, Freeport, Texas. Several communities exceed the threshold of one-half standard deviation above the mean for more than one index (Fort Myers Beach, Florida; New Port Richey, Florida; Panama City, Florida; Sarasota, Florida; Stock Island, Florida; Freeport, Texas; Galveston, Texas; and Houston, Texas). These communities would be the most likely to exhibit vulnerabilities to social or economic disruption due to regulatory change.

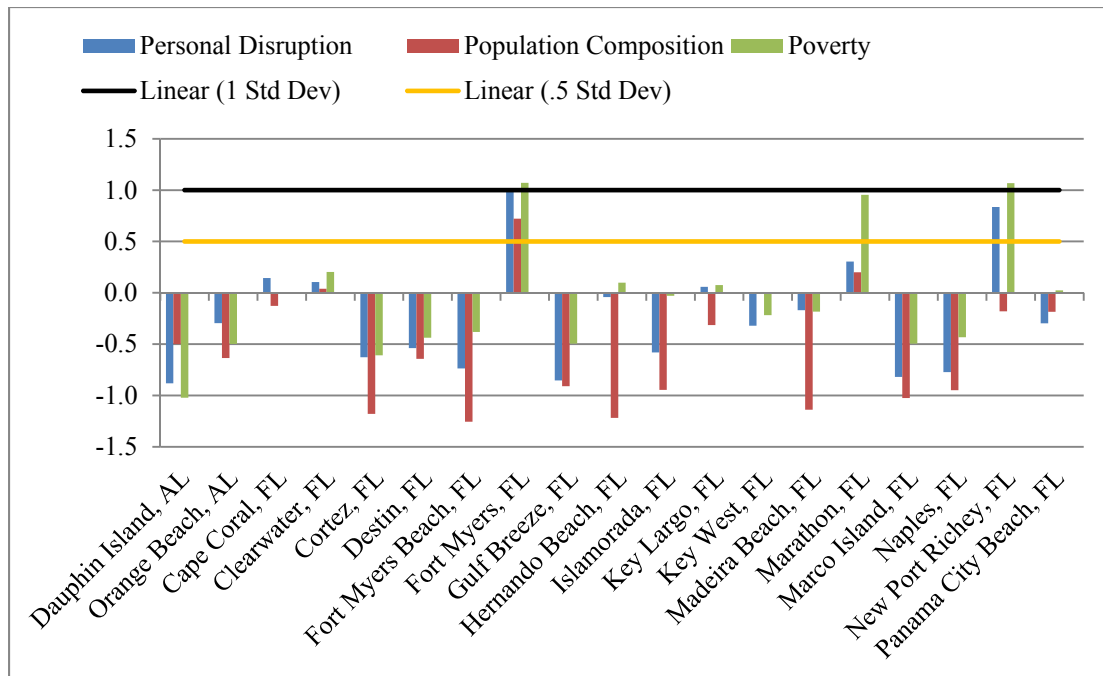


Figure 3.4.2.1. Social vulnerability indices for top commercial and recreational fishing communities.

Source: SERO, Community Social Vulnerability Indicators Database 2014 (American Community Survey 2010-2014).

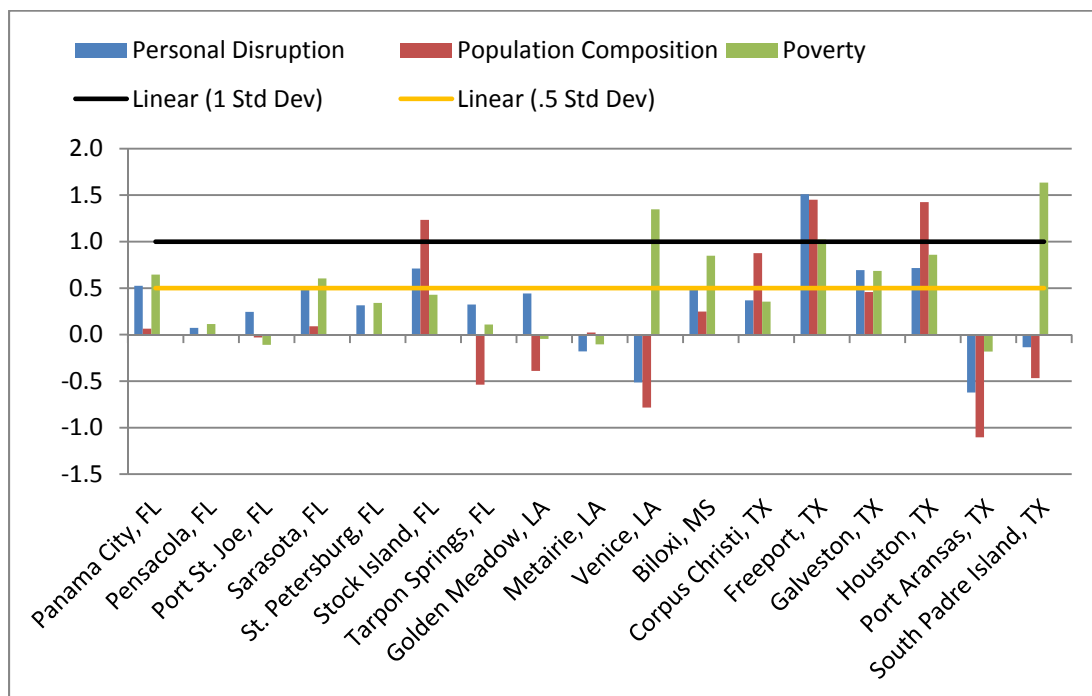


Figure 3.4.2.2. Social vulnerability indices for top commercial and recreational fishing communities continued.

Source: SERO, Community Social Vulnerability Indicators Database 2014 (American Community Survey 2010-2014).

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 red snapper specifically (participation). However, the implementation of the proposed action of this framework action would not discriminate against any group based on their race, ethnicity, or income status because the action would be applied to all participants in the fishery. Further, there is no known subsistence fishing or consumption of red snapper. Thus, the actions of this amendment are not expected to result in adverse or disproportionate environmental or public health impacts to EJ populations. In addition, the effects from modifying the recreational ACT for red snapper are expected to be positive. Although no EJ issues have been identified, the absence of potential EJ concerns cannot be assumed.

3.5 Description of the Administrative Environment

3.5.1 Federal Fishery Management

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

Responsibility for federal fishery management is shared by 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 Appendix A. 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 Council meetings that, with few exceptions for discussing personnel matters, are open to the public. 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 National Oceanic and Atmospheric Administration’s Office of Law Enforcement, the United States 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, which have developed joint enforcement agreements and cooperative enforcement programs (www.gsmfc.org).

The red snapper stock in the Gulf is classified as overfished, but no longer undergoing overfishing. A rebuilding plan for red snapper was first implemented under Amendment 1 (GMFMC 1989), and has undergone several revisions. The current rebuilding plan was established in Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007), and calls for rebuilding the stock to a level capable of supporting maximum sustainable yield on a continuing basis by 2032. Periodic adjustments to the ACL and other management measures needed to affect rebuilding are implemented through framework (regulatory) amendments.

3.5.2 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 respective state’s 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 on their respective web pages (Table 3.5.2.1).

Table 3.5.2.1. Gulf state marine resource agencies and web pages.

State Marine Resource Agency	Web Page
Alabama Marine Resources Division	http://www.outdooralabama.com/
Florida Fish and Wildlife Conservation Commission	http://myfwc.com/
Louisiana Department of Wildlife and Fisheries	http://www.wlf.louisiana.gov/
Mississippi Department of Marine Resources	http://www.dmr.ms.gov/
Texas Parks and Wildlife Department	http://tpwd.texas.gov/

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action 1 – Modify Red Snapper Recreational Annual Catch Target (ACT)

Alternative 1: No Action. The red snapper ACTs for the recreational components will remain at 20% below the recreational component annual catch limits (ACLs).

Alternative 2: Modify the respective component ACTs for the private angling and for-hire components while maintaining the overall recreational ACT.

Buffer values between the component ACT and ACL:

Option 2a: The for-hire component ACT is 15% below the component ACL; the private angling component ACT is 23.7% below the component ACL

Option 2b: The for-hire component ACT is 10% below the component ACL; the private angling component ACT is 27.3% below the component ACL

Option 2c: The for-hire component ACT is 5% below the component ACL; the private angling component ACT is 31% below the component ACL

Preferred Alternative 3: Apply the Gulf of Mexico Fishery Management Council's ACL/ACT Control Rule, using landings from 2014 – 2017, to set the respective component ACT buffers for the private angling and for-hire components. This results in a for-hire component ACT set 9% below the for-hire component ACL. The private angling component ACT would remain at 20% below the private angling component ACL. The total recreational sector ACT would be approximately 15% below the recreational sector ACL.

Preferred Alternative 4: Establish a sunset provision on the modification of the component ACT buffers of the recreational sector for red snapper. Any changes to the recreational component ACT buffers would end at the end of the 2019 fishing season.

4.1.1 Direct and Indirect Effects on the Physical Environment

Sections 3.1, 3.2, and GMFMC (2014a; 2016) describe the physical environment and habitat used by red snapper. In summary, adult red snapper targeted by the reef fish fishery are found around hard bottom habitat. Most commercial red snapper fishermen use handlines (mostly bandit rigs and electric reels, occasionally rod-and-reel) with a small percentage (generally <5% annually) caught with bottom longlines. Recreational red snapper fishing almost exclusively uses vertical-line gear, most frequently rod-and-reel. The following describes the effects of handline fishing gear on the physical environment. Because the actions of this amendment apply only to the recreational sector and longlines are used exclusively by the commercial sector, the effects of longline gear will not be discussed here. A summary of effects from longline gear on the physical environment can be found in GMFMC (2011b).

Handline gear (rod-and-reel) used in recreational fishing for reef fish is generally suspended over hard bottom because many managed reef fish species occur higher over this type of substrate than over sand or mud bottoms (GMFMC 2004a). Recreational fishing with rod-and-reel lays gear on the bottom. The terminal part of the gear is either lifted off the bottom 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 older and covered with invertebrate growth (A. David, Southeast Fisheries Science Center, pers. comm.), a clear indication that bottom fishing has had an impact on the physical environment prior to fishing being prohibited in the area (GMFMC 2003).

Anchor damage is also associated with handline fishing vessels, particularly by the recreational sector where fishermen may repeatedly visit well marked fishing locations. Bohnsack (2000) points out 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 red snapper occurs.

Effects from fishing on the physical environment are generally tied to fishing effort. The greater the fishing effort, the more gear interacts with the bottom. This action alone should have no direct effect on the physical environment regardless of the alternative because modifying the buffers between the recreational component ACTs and ACLs is administrative in nature. However, specifying these values may indirectly affect the physical environment by defining the future level of fishing effort needed to harvest the ACL. In general, an alternative which allows greater levels of fishing effort (more gear being used) would have a greater negative effect than an alternative which allows for less fishing effort. However, these effects are expected to be minimal because a significant change in overall fishing effort is not expected. The reef fish fishery is a multispecies fishery. If anglers are not able to retain one species, they often shift their effort to other species, maintaining over all reef fish fishing effort.

Alternative 1 (No Action) would not modify the buffer between the recreational component ACTs and ACLs, both presently set at 20%. Since it is the current status quo, **Alternative 1** would result in no change in the direct or indirect effects on the physical environment.

Alternative 2 and its options would modify the buffer between the recreational component ACTs and ACLs to give the federal for-hire component a smaller buffer by increasing the private angling component’s buffer; however, the combined recreational sector ACT would continue to be 20% below the combined recreational sector ACL. Because the predominant method of harvest for both the private angling and for-hire components is hook-and-line gear, and because the combined recreational sector ACT to ACL buffer is still 20%, little change in overall fishing effort is expected. Therefore, the potential effects of any of the options in **Alternative 2** on the physical environment are expected to be similar to **Alternative 1**.

Preferred Alternative 3 would reduce the buffer between the federal for-hire component ACT and ACL according to the Gulf of Mexico Fishery Management Council’s (Council) ACT/ACT Control Rule; this would set the for-hire component ACT 9% below the for-hire component’s

ACL. Under **Preferred Alternative 3**, the private angling component's buffer between its ACT and ACL would remain unchanged at 20%, resulting in a combined recreational sector ACT which is approximately 15% below the combined recreational sector ACL. A decrease of 5% in the buffer between the combined recreational sector ACT and ACL would result in an increase in fishing effort by the for-hire component, which would have a greater negative effect on the physical environment when compared to **Alternatives 1 and 2**, which are expected to result in comparatively less fishing effort. It is not possible to accurately quantify the higher adverse effects from the additional fishing effort that would result under **Preferred Alternative 3**.

Preferred Alternative 4 would establish a sunset provision on the modification of the component ACT buffers of the recreational sector for red snapper, terminating any changes at the end of the 2019 fishing season. Because **Preferred Alternative 4** makes a modification to either **Alternative 2** or **Preferred Alternative 3** by returning the component ACT buffers back to the status quo (**Alternative 1**) after one year, its effect on the physical environment depends on whether **Alternative 2** or **Preferred Alternative 3** is selected as preferred by the Council. **Preferred Alternative 4** is not expected to change the effect of fishing on the physical environment if **Alternative 2** is selected as preferred, because **Alternative 2** would result in no change in the effects to the physical environment when compared to **Alternative 1**. **Preferred Alternative 4** would minimize any adverse effects on the physical environment if **Preferred Alternative 3** is selected as preferred because any increased negative effects to the physical environment would be limited to the 2019 fishing season.

Another framework action currently in development would increase the recreational ACL from 6.73 mp to as much as 7.84 mp (or as low as 7.01 mp). The anticipated increase in the recreational ACL may increase indirect effects on the physical environment through increased fishing effort in the form of longer fishing seasons for the private angling and for-hire components. These increase indirect effects would be greater from the for-hire component, depending on whether an option in **Alternative 2** or **Preferred Alternative 3** is chosen as preferred. The indirect effects due to the combination of increasing the recreational red snapper ACL and this action would be greatest under **Preferred Alternative 3**, followed by **Alternative 2**, but would only be valid for the 2019 fishing season if **Preferred Alternative 4** is selected as a preferred alternative.

4.1.2 Direct and Indirect Effects on the Biological/Ecological Environment

Direct and indirect effects from fishery management actions on the biological and ecological environment have been detailed in GMFMC (2014a; 2016) and are incorporated herein by reference. Management actions that affect the biological and ecological environment mostly relate to the impacts of fishing on a species' population size, life history, and the role of the species within its habitat. Removal of fish from the population through fishing reduces the overall population size. Fishing gears have different selectivity patterns which refer to a fishing method's ability to target and capture organisms by size and species. This would include the number of discards, mostly sublegal fish or fish caught during seasonal closures, and the mortality associated with releasing these fish.

Modifying the buffers between the recreational component ACTs and ACLs for red snapper should not directly affect the biological/ecological environment because they simply provide fishery managers with defined harvest levels to consider in developing fishery management measures. Managers use catch limits in part to evaluate whether the harvest within a fishing year is below or above recommended limits. Therefore, **Alternative 1**, **Alternative 2**, and **Preferred Alternative 3** should have no direct effect on the biological/ecological environment. However, specifying these values would indirectly affect the biological/ecological environment by defining the future level of harvest that is not to be exceeded.

For the 2019 recreational red snapper fishing season, **Options 2a – 2c** of **Alternative 2** would provide combined recreational catch limits equal to **Alternative 1**, since the combined recreational red snapper ACT would still be set 20% below the combined recreational red snapper ACL. As such, the potential effects of **Alternative 2** on the biological and ecological environment are equivalent to **Alternative 1**.

Preferred Alternative 3 would decrease the buffer between the federal for-hire component's ACT and its ACL from 20% to 9%, and would decrease the buffer between the combined recreational red snapper ACT and the ACL from 20% to approximately 15%. Although **Preferred Alternative 3** would allow for a longer fishing season and a higher amount of removals of red snapper from the stock, so long as overfishing does not occur, the rebuilding progress for the red snapper stock is not expected to be negatively affected.

The relationships among species in marine ecosystems are complex and poorly understood, making the nature and magnitude of ecological effects difficult to predict with any accuracy. The most recent red snapper stock assessment (SEDAR 52 2018) indicated that the red snapper stock is not overfished and not experiencing overfishing. It is possible that forage species and competitor species could increase or decrease in abundance in response to a decrease or increase in red snapper abundance. This action, regardless of the alternative, should not directly affect red snapper abundance, thus any effects on forage species and competitor species would not likely be different from no action. Although birds, dolphins, and other predators may feed on red snapper discards, there is no evidence that any of these species rely on red snapper discards for food. Changes in the prosecution of the reef fish fishery are not expected from this action, so no additional effects to protected resources (see Section 3.3) are anticipated.

The reef fish fishery in the Gulf is multispecies in nature, such that if fishing for one species is no longer allowed (seasonal closure, bag limit caught, or other reason), anglers will usually target a different species. The alternatives in this action should result in minimal differences in impacts in terms of bycatch compared to **Alternative 1**. **Alternative 2** would be expected to result in an equivalent amount of bycatch compared to **Alternative 1**, since overall fishing effort is not expected to be substantially different. Bycatch would be expected to be somewhat increased under **Preferred Alternative 3**, which would increase the amount of fishing effort on the stock compared to **Alternatives 1** and **2**. **Preferred Alternative 4** would revert any changes in fishing effort back to the status quo (**Alternative 1**) at the end of the 2019 fishing season which, when coupled with **Preferred Alternative 3**, would reduce bycatch for 2020 and subsequent fishing years.

Another framework action currently in development would increase the recreational ACL from 6.73 mp to as much as 7.84 mp (or as low as 7.01 mp). The anticipated increase in the recreational ACL may increase indirect effects on the physical environment through increased fishing effort in the form of longer fishing seasons for the private angling and for-hire components. These increase indirect effects would be greater from the for-hire component, depending on whether an option in **Alternative 2** or **Preferred Alternative 3** is chosen as preferred. The indirect effects due to the combination of increasing the recreational red snapper ACL and this action would be greatest under **Preferred Alternative 3**, followed by **Alternative 2**, but would only be valid for the 2019 fishing season if **Preferred Alternative 4** is selected as a preferred alternative.

4.1.3 Direct and Indirect Effects on the Economic Environment

For the federal for-hire and private angling components of the recreational sector, **Alternative 1** (No Action) would maintain the current 20 percent buffer between the federal for-hire and private angling red snapper ACLs and corresponding ACTs. Because **Alternative 1** is not expected to alter fishing opportunities or recreational red snapper harvest, **Alternative 1** would not be expected to result in direct economic effects. However, **Alternative 1** may be associated with adverse indirect economic effects if it is assumed that **Alternative 1** unnecessarily forgoes additional fishing opportunities.

Alternative 2 would maintain a 20% buffer between the recreational red snapper ACL and ACT. However, **Alternative 2** would adjust the ACL-ACT buffers for the federal for-hire and private angling components. **Options 2a, 2b, and 2c** would reduce the federal for-hire buffer and therefore increase the federal for-hire ACT, potentially offering additional fishing opportunities to anglers fishing from for-hire vessels. To maintain a constant overall recreational ACT, **Options 2a, 2b, and 2c** would reduce the private angling ACT by the amount required to offset the proposed federal for-hire ACT increases.

Alternative 3 would maintain the 20% buffer for the private angling component but decrease the federal for-hire buffer to 9% below the ACL. For both components of the recreational sector, the red snapper component ACL, corresponding ACT and ACT changes relative to **Alternative 1**, and the overall changes in the recreational ACT are provided in Table 4.3.1. ACT changes are obtained by subtracting the baseline ACT (**Alternative 1** ACT) from the corresponding component's ACT. For example the private angling ACT change in **Alternative 2-Option 2c**, i.e., -0.43 mp, is obtained by subtracting 3.11 mp from 2.68 mp. Total recreational ACT changes are the sum of the respective private angling and federal for-hire ACT changes.

Table 4.3.1. Recreational component ACLs, ACTs, and ACT changes (in million pounds) relative to **Alternative 1**.

	Private Angling			Federal For-hire			Total Recreational ACT Change
	ACL	ACT	ACT Change	ACL	ACT	ACT Change	
Alternative 1	3.88	3.11		2.85	2.28		
Alternative 2 Option 2a	3.88	2.96	-0.15	2.85	2.42	0.14	0
Alternative 2 Option 2b	3.88	2.82	-0.29	2.85	2.57	0.29	0
Alternative 2 Option 2c	3.88	2.68	-0.43	2.85	2.71	0.43	0
Preferred Alternative 3	3.88	3.11	0.00	2.85	2.59	0.31	0.31

For anglers, changes in economic value expected to result from the recreational measures considered in this action can be evaluated based on consumer surplus (CS) changes. CS per additional fish kept during a trip is defined as the amount of money an angler would be willing to pay for a fish in excess of the cost to harvest the fish. The CS value per fish for a second red snapper kept is estimated at \$82.34 (2017 dollars). Economic value for for-hire vessels 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. For vessels in the Gulf, the estimated NOR value is \$155 (2015 dollars) per charter angler trip (Liese and Carter 2011). The estimated NOR value per headboat angler trip is \$54 (2015 dollars) (C. Liese, NMFS SEFSC, pers. comm.). In the absence of estimates for changes in charter and headboat angler trips expected to result from proposed increases to the federal for-hire ACT, the management alternatives are evaluated based on CS changes.

Relative to **Alternative 1**, all options in **Alternative 2 (Options 2a, 2b, and 2c)** offset increases in federal for-hire ACTs with equivalent decreases in private angling ACTs. Therefore, these options would not result in aggregate changes in consumer surplus because the recreational ACT would be left unchanged; CS reductions borne by private anglers would be counterbalanced by equal CS gains for anglers fishing from for-hire vessels. However, **Options 2a, 2b, and 2c** are expected to generate additional PS for for-hire operators. Although PS changes cannot be quantified at this time, they would be expected to be commensurate with increases in federal for-hire red snapper ACTs. **Option 2c**, which corresponds to the greatest increase in federal for-hire ACT would be expected to result in the greatest increase in PS to federal for-hire operators.

Because **Preferred Alternative 3** maintains the private angling buffer and ACT, but increases the federal for-hire red snapper ACT by decreasing the buffer, **it** would be expected to result in

CS and PS increases. Based on an average weight of 6.46 lbs per red snapper (SERO Recreational ACL file), a 0.31 mp increase in ACT would correspond to 47,988 red snapper. The expected change in economic value is obtained by multiplying the number of fish by the CS value per fish (\$82.34). Therefore, **Preferred Alternative 3** would be expected to increase anglers' CS by \$3.95 million. Although not quantifiable at this time, increases in PS to for-hire operators are also expected to result from **Preferred Alternative 3**. Because **Preferred Alternative 3** is the only option that would be expected to increase CS to anglers and PS to for-hire operators, it is expected to result in the largest increase in economic benefits to the recreational sector.

It is noted that another framework action currently in development would increase the recreational ACL from 6.73 mp to as much as 7.84 mp (or as low as 7.01 mp). The anticipated increase in the recreational ACL would not alter the analysis provided here but would simply adjust upwards the absolute value of the changes in CS and PS expected to result from the modifications to the private angling and federal for-hire red snapper buffers considered here. **Preferred Alternative 4** would end adjustments to ACT buffers at the end of the 2019 fishing season. **Preferred Alternative 4** would therefore limit expected economic effects discussed in this section to one fishing season.

4.1.4 Direct and Indirect Effects on the Social Environment

Additional effects would not be expected from **Alternative 1** and the ACTs would remain unchanged. However, the federal for-hire component has not reached more than 95% of its ACT in any year since the 20% buffer was implemented in 2015. In 2017, when the federal for-hire component met 94.9% of the ACT, landings totaled 75.9% of the component's ACL. Thus under **Alternative 1**, the federal for-hire component would continue to fish under seasons that are too short to allow the harvest of the component's quota. On the other hand, the 20% buffer used to set the ACT has not been sufficient to constrain landings to the private angling ACL. However, it is more difficult to estimate the length of the private angling fishing season based on the ACT due to inconsistent state water seasons and the mandated extension of the 2017 private angling season following the estimated federal water season. Further, for 2018 and 2019, the private angling component is fishing under state management through exempted fishing permits (EFP), rather than the federal system of estimating the season length based on a Gulf-wide ACT.

The effects from modifying the ACT buffer would reflect the direction and magnitude of change to the ACT for each component, as the ACT is used to estimate the season length in federal waters for each component. If the new ACT is larger than **Alternative 1**, positive effects would be expected as a longer season would likely result. If the ACT is smaller than **Alternative 1**, a shorter season would be likely, resulting in negative effects. Because of the large amount of fish estimated to be caught per day, an increase or decrease to the ACT may only change the length of the season by a matter of days, if at all. On the other hand, if the buffer is reduced by enough that the for-hire component ACL is exceeded and the total recreational ACL is exceeded, negative effects would result if an overage adjustment is triggered. The buffer, then, should be large enough to constrain landings to the ACL and avoid the negative effects of an overage adjustment, but small enough to minimize the amount of fish left unharvested.

For the for-hire component, the smallest buffer (5%, **Option 2c**) would allow the longest fishing season to be estimated, followed by buffers of increasing size (9% under **Alternative 3**, 10% for **Option 2b**, and 15% for **Option 2a**). On the other hand, the smaller the reduction to the buffer (to 15% under **Option 2a**) the less likely it will be to exceed the for-hire component ACL, which would trigger an overage adjustment if the total recreational sector ACL is exceeded.

It is difficult to evaluate the effects on the private angling component, which has exceeded its component ACT each year since 2015, and the component ACL each year except 2015. Thus, there is no alternative that would decrease the buffer. The private angling component buffer is the same under **Alternative 3** as **Alternative 1**. Thus, the effects would be the same. The private angling component buffer would be increased under each **Alternative 2** option, resulting in a smaller ACT. Because the private angling component is managed under EFPs for the 2018 and 2019 fishing seasons, the regulatory ACT is not applicable and there would be no direct effects from any of these options during these years. Beginning in 2020, there could be some negative effects if a smaller buffer is selected that results in a shorter estimated federal season for the private angling component. However, it is likely that some states would continue to allow fishing in state waters while federal waters are closed providing additional recreational fishing opportunities, especially if the increased buffer reduces the length of the fishing season. Thus, increasing the private angling buffer would not be expected to increase the likelihood of constraining landings to the private angling ACL.

Preferred Alternative 4 would allow the new ACTs to be in place for 2019 only. As noted above, there would be no direct effects on the private angling component from this action during 2019, as the private angling component will be managed by the states through EFPs. If reducing the federal for-hire buffer fails to constrain the for-hire component to its component ACL and the total recreational sector ACL is exceeded, negative effects would result in the following fishing season as the ACL is reduced to account for the overage.

Currently, the Council is considering a framework action that would increase the red snapper ACL. Increasing the ACL would increase both the private angling and federal for-hire component ACLs and ACTs respectively for the alternatives provided here. Because a larger amount of fish would be allowed to be harvested under all the alternatives compared to **Alternative 1**, there would be some additional positive effects, as discussed in that framework action.

4.1.5 Direct and Indirect Effects on the Administrative Environment

The revision of an ACT is an administrative action and would have direct effects on the administrative environment through rulemaking, monitoring quotas, setting fishing seasons, and enforcing fishing regulations. ACTs are used administratively to set recreational fishing seasons with the buffer between the ACT and ACL adjusted to minimize the probability/component from exceeding. Because none of the alternatives would remove ACTs from use in managing the recreational sector, the direct effects on this environment between **Alternative 1** (no action), **Alternatives 2**, **Preferred Alternative 3**, and **Preferred Alternative 4** would be similar.

Indirect effects of setting ACLs and ACTs include action required if the recreational sector ACL

is exceeded. Although red snapper is not considered overfished at this time and paybacks from exceeding recreational sector and component ACLs do not apply, further action on adjusting seasons or ACTs would likely result if the ACLs were regularly exceeded. Thus, the less likely an ACT would prevent an ACL from being exceeded, the greater the likelihood that further administrative action would need to be taken. It should also be noted that the private angling component of the recreational red snapper sector is currently being managed under an exempted fishing permit (EFP) for the 2018 and 2019 fishing years. Thus, anything in the following discussion relating to this component would apply to 2020 and beyond.

For the recreational sector as a whole, the difference between **Alternative 1** and **Alternative 2** would likely be minimal because the overall buffer between the recreational sector ACT and ACL would be the same at 20%. However, in **Alternative 2**, the for-hire component ACT buffer is reduced relative to no action in **Options 2a-2c** and thus increase the likelihood that the for-hire component ACL might be exceeded. Conversely, **Options 2a-2c** commensurately increase the private angler component ACT buffer and reduce the likelihood that the private angling component ACL might be exceeded. These opposing component buffers, when taken together, are likely to cancel each other out with respect to requiring future action.

Preferred Alternative 3 only reduces the buffer for the for-hire sector and thereby reduces the overall recreational ACT (buffer) when combined with the private angler buffer from 20% to approximately 15%. For the for-hire component, the likelihood of exceeding the reduced component buffer under this alternative is low as historically, the component has not exceeded its ACT. However, there is a greater likelihood under **Preferred Alternative 3** that the recreational ACT could be exceeded and require further action as it will be lower. This would add to the administrative burden, thus adversely affect the subject environment compared to **Alternatives 1** and **2**.

Preferred Alternative 4 would limit this action to just one year. Therefore, any adverse effects to the administrative environment from **Alternative 2** or **Preferred Alternative 3** would be limited compared if **Alternative 4** were not selected as preferred.

It should be noted that the for-hire component ACT is expected to be revised through another framework action that would increase the recreational and component ACLs and ACTs as a result of the most recent stock assessment. In order to reduce the administrative burden, these actions would be combined during rulemaking to simplify the process.

4.2 Cumulative Effects

The cumulative effects of establishing ACTs were analyzed in the environmental impact statements (EISs) for Amendments 28 and 40 (GMFMC 2015a and 2014a) as well as in the Generic ACL/Accountability Measure (AM) Amendment (GMFMC 2011b). In addition, cumulative effects relative to red snapper management have been analyzed in the EISs for Amendments 22 (GMFMC 2004b), 26 (GMFMC 2006), and 27/14 (GMFMC 2007), and relative to the reef fish fishery in Amendment 30A (GMFMC 2008a), Amendments 30B (GMFMC 2008b), 31 (GMFMC 2009), and 32 (GMFMC 2011a). These cumulative effects analyses are incorporated here by reference. Other pertinent actions are summarized in the history of management (Section 1.3). In addition, the private angling component of the red snapper recreational sector is currently operating under an EFP where the states are given allocation from the red snapper recreational ACL and set their own seasons and monitor landings. This EFP ends after the 2019 fishing season.

Currently, the Council is considering reasonably foreseeable future actions (RFFAs) to the Reef Fish FMP. These include: Amendment 36B, which would further revise the red snapper and grouper-tilefish commercial IFQ programs; Amendments 41 and 42, which would provide flexibility in the management of the charter and headboat vessel fleets, respectively; Amendment 48, which would establish status determination criteria for many reef fish stocks; Amendment 49, which would revise sea turtle release requirements (rulemaking pending); Amendment 50, which would establish state recreational management programs for red snapper; a generic amendment, which would modify charter vessel and headboat reporting requirements; and some as yet unnumbered plan amendments to address red snapper allocation, the carryover of unharvested quota, and acceptable biological catch control rule revisions and framework procedures. In addition, several framework actions are being developed to address red snapper, greater amberjack, and hogfish. Descriptions of these actions can be found on the Council's website at <http://gulfcouncil.org/>. Of note, the framework action that would address red snapper would revise the commercial and recreational ACL and recreational ACT. Assuming this action and the red snapper ACL and ACT revision framework actions proceed along similar timelines, the rulemaking for these actions would likely be combined.

The affected area of this proposed action, as well as the actions described above, encompasses the state and federal waters of the Gulf as well as communities in the Gulf engaged in reef fish fishing. This proposed action would revise the recreational component ACTs. This action is not expected to have significant beneficial or adverse cumulative effects on the physical and biological/ecological environments as it would minimally affect fishing practices (see the subject descriptions in sections 4.1-4.2). The action is not expected to have significant socio-economic effects, either beneficial or adverse (see the discussion of economic and social effects in sections 4.1.3-4.1.4) as this action would not substantially affect fishery operations. However, the action is expected to provide some economic and social benefits to the for-hire component as they would likely have a slightly longer fishing season. The action is also not expected to adversely or beneficially significantly affect the administrative environment. Finally, this action would not be expected to change the long-term management goals for red snapper as well as the RFFAs (see preceding paragraph) designed to manage the red snapper stock in a manner that prevents overfishing while achieving optimum yield on a continuing basis. With respect to public health

or safety, the action, combined with past and RFFAs, is not expected to have substantial adverse effects because, as discussed Section 4.1, the action would not be expected to change how the fishery is prosecuted.

Non-fishery actions affecting the reef fish fishery have been described in previous cumulative effect analyses (e.g., Amendments 28 and 40). Three important events include impacts of the Northern Gulf of Mexico Hypoxic Zone, the *Deepwater Horizon* MC252 oil spill, and climate change (see next paragraph). Reef fish species are mobile and are able to avoid hypoxic conditions, so any effects from the Northern Gulf of Mexico Hypoxic Zone on reef fish species are likely minimal regardless of this action. Impacts from the *Deepwater Horizon* MC252 oil spill are still being examined; however, as indicated in Section 3.2, the oil spill had some adverse effects on fish species. However, it is unlikely that the action, as described in Chapter 2, would have any significant cumulative effect given the action would minimally change fishing operations as discussed in section 4.1.

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 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 as discussed in Section 3.2. However, the extent of these effects cannot be quantified at this time. The proposed action is not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing as these actions should not change how the fishery is prosecuted. As described in Section 3.2, the contribution to greenhouse gas emissions from fishing is minor compared to other emission sources (e.g., oil platforms) in the Gulf.

The effects of the proposed action 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. Recreational information is collected through both state and federal sampling programs designed to estimate landings and fishing effort.

CHAPTER 5. REGULATORY IMPACT REVIEW

CHAPTER 6. REGULATORY FLEXIBILITY ANALYSIS

6.1 Introduction

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

With certain exceptions, the RFA requires agencies to conduct a regulatory flexibility analysis for each proposed rule. The regulatory flexibility analysis is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. The following regulatory flexibility analysis was conducted to determine if the proposed rule would have a significant economic impact on a substantial number of small entities or not.

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

The primary purpose and need, issues, problems, and objectives of the proposed action are presented in Section 1.2 and are incorporated herein by reference.

6.3 Identification of federal rules which may duplicate, overlap or conflict with the proposed rule.

No federal rules have been identified that duplicate or conflict with the proposed rule. Although the proposed rule overlaps with the framework action to increase the catch limits for red snapper, it does not result in any additional regulatory burden.

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

The rule concerns recreational fishing for red snapper in federal waters of the Gulf of Mexico (Gulf) and would have a direct impact on anglers (recreational fishers). Anglers are not considered small entities as that term is defined in 5 U.S.C. 601(6), whether fishing from for-hire

fishing, private or leased vessels. Therefore, estimates of the number of anglers directly affected by the rule and the impacts on them are not provided here.

The rule would indirectly impact for-hire fishing vessels if **Preferred Alternatives 3 and 4 of Action 1** cause changes in angler demand for for-hire fishing services in 2019. Any for-hire vessel that takes paying anglers into federal waters of the Gulf to fish for and land red snapper must have a valid limited-access Gulf of Mexico charter/headboat for reef fish permit or historical captain Gulf of Mexico charter/headboat for reef fish permit assigned to it. As of July 12, 2018, there are 1,191 vessels with a valid or renewable charter/headboat permit and another 27 with a valid or renewable historical captain permit. A business that is primarily involved in the for-hire fishing industry (NAICS code 487210) 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 \$7.5 million for all its affiliated operations worldwide. All for-hire fishing businesses that may be indirectly affected by the rule are expected to be small.

6.5 Description of the projected reporting, record-keeping and other compliance requirements of the proposed rule

The actions would not impose additional reporting or record-keeping requirements on small businesses. **Preferred Alternative 3** would reduce the annual catch target (ACT) buffer for the for-hire component from 20% to 9% and **Preferred Alternative 4** would terminate that change at the end of the 2019 fishing season. The one-season reduction of the buffer would allow federally permitted for-hire fishing vessels to increase their collective landings of red snapper in 2019. Currently, the for-hire component's annual catch limit is 2.848 million lbs ww and its ACT is 2.278 million lbs ww. **Preferred Alternative 3** would allow the for-hire component to land up to 2.592 million lbs, which would be an addition of 0.256 million lbs ww in 2019. Consequently, for-hire fishing businesses could be able to offer more fishing trips directed to catching red snapper; however, the realization of those additional trips and economic benefits that may derive from them are conditional upon the behavior of anglers as paying customers as well as other factors and cannot be quantified. The RFA does not consider such indirect impacts on small entities.

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

It is concluded from the above that no small businesses are directly impacted from the rule and there would be no significant economic impact on a substantial number of small entities.

CHAPTER 7. AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED

The following have or will be consulted:

National Marine Fisheries Service

- Southeast Fisheries Science Center
- Southeast Regional Office
- Protected Resources
- Habitat Conservation
- Sustainable Fisheries

NOAA General Counsel

Environmental Protection Agency

United States Coast Guard

Texas Parks and Wildlife Department

Alabama Department of Conservation and Natural Resources/Marine Resources Division

Louisiana Department of Wildlife and Fisheries

Mississippi Department of Marine Resources

Florida Fish and Wildlife Conservation Commission

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GMFMC = Gulf of Mexico Fishery Management Council, SAFMC = South Atlantic Fishery Management Council, NMFS = National Marine Fisheries Service, SF = Sustainable Fisheries Division, PR = Protected Resources Division, HC = Habitat Conservation Division, GC = General Counsel

CHAPTER 9. REFERENCES

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APPENDIX A: ACL/ACT CONTROL RULE WORKSHEETS

A.1 ACT/ACT Control Rule for the Private Angling and For-hire Components of the Recreational Sector for Gulf of Mexico Red Snapper

ACL/ACT Buffer Spreadsheet			version 4.1 - April 2011	Red Snapper	
sum of points	6.5			Private Angler	Recreational - 2018/w 2017
max points	8.5			Buffer between ACLand ACT (or ABC and ACL)	Unweighted 15
Min. Buffer	0	min. buffer	User adjustable		Weighted 18
Max Unw. Buff	19	max unwt. Buff			
Max Wtd Buff	25	max wtd. buffer	User adjustable		
	Component	Element score	Element	Selection	Element result
	Stock assemblage	0	This ACL/ACT is for a single stock.	x	0
		1	This ACL/ACT is for a stock assemblage, or an indicator species for a stock assemblage		
	Ability to Constrain Catch	0	Catch limit has been exceeded 0 or 1 times in last 4 years		4.5
		1	Catch limit has been exceeded 2 or more times in last 4 years	x	
			For the year with max. overage, add 0.5 pts. For every 10 percentage points (rounded up) above ACL	3.5	
			Not applicable (there is no catch limit)		
			Apply this component to recreational fisheries, not commercial or IFQ fisheries		
	Precision of Landings Data Recreational	0	Method of absolute counting		1
		1	MRIP proportional standard error (PSE) <= 20	x	
		2	MRIP proportional standard error (PSE) > 20		
			Not applicable (will not be included in buffer calculation)		
			Apply this component to commercial fisheries or any fishery under an IFQ program		
	Precision of Landings Data Commercial	0	Landings from IFQ program		not applicable
		1	Landings based on dealer reporting		
		2	Landings based on other		
			Not applicable (will not be included in buffer calculation)	x	
	Timeliness	0	In-season accountability measures used or fishery is under an IFQ		1
		1	In-season accountability measures not used	x	
				Sum	6.5
Weighting factor					
		Element weight	Element	Selection	Weighting
	Overfished status	0	1. Stock biomass is at or above B _{OY} (or proxy).		0.2
		0.1	2. Stock biomass is below B _{OY} (or proxy) but at or above B _{MSY} (or proxy).		
		0.2	3. Stock biomass is below B _{MSY} (or proxy) but at or above minimum stock size threshold (MSST).	x	
		0.3	4. Stock is overfished, below MSST.		
		0.3	5. Status criterion is unknown.		
Year	Catch	ACL	Over/Under %		
2014	2,207,334	3,110,030	-29%	Assume AM40 allocations	
2015	3,894,409	4,043,000	-4%	Private angler component	
2016	5,187,901	4,150,000	25%	Private angler component	
2017	6,518,789	3,755,094	74%	Private angler component	
			Maximum overage in years with sector separation = 74% = 3.5 points		
			ACL exceeded 2 times in last 2 years		
			Data Source ACL Data set SERO 9 May 2018		

Figure A.1.1: ACL/ACT Control Rule for the private angling component of the recreational sector for Gulf of Mexico red snapper. 2017 landings are preliminary at the time of this analysis: 9 May 2018.

ACL/ACT Buffer Spreadsheet			version 4.1 - April 2011	Red Snapper	
sum of points	2			For-Hire	Recreational - 2018/w 201
max points	5.0		Buffer between ACLand ACT (or ABC and ACL)	Unweighted	8
Min. Buffer	0	min. buffer	User adjustable	Weighted	9
Max Unw.Buff	19	max unwt. Buff			
Max Wtd Buff	25	max wtd. buffer	User adjustable		
	Component	Element score	Element	Selection	Element result
	Stock assemblage	0	This ACL/ACT is for a single stock.	x	0
		1	This ACL/ACT is for a stock assemblage, or an indicator species for a stock assemblage		
	Ability to	0	Catch limit has been exceeded 0 or 1 times in last 4 years	x	0
	Constrain Catch	1	Catch limit has been exceeded 2 or more times in last 4 years		
			For the year with max. overage, add 0.5 pts. For every 10 percentage points (rounded up) above ACL	0.0	
			Not applicable (there is no catch limit)		
			Apply this component to recreational fisheries, not commercial or IFQ fisheries		
		0	Method of absolute counting		1
	Precision of	1	MRIP proportional standard error (PSE) <= 20	x	
	Landings Data	2	MRIP proportional standard error (PSE) > 20		
	Recreational		Not applicable (will not be included in buffer calculation)		
			Apply this component to commercial fisheries or any fishery under an IFQ program		
	Precision of	0	Landings from IFQ program		not applicable
		1	Landings based on dealer reporting		
	Landings Data	2	Landings based on other		
	Commercial		Not applicable (will not be included in buffer calculation)	x	
	Timeliness	0	In-season accountability measures used or fishery is under an IFQ		1
		1	In-season accountability measures not used	x	
				Sum	2
Weighting factor					
	Element weight	Element	Selection	Weighting	
	Overfished status	0	1. Stock biomass is at or above B_{OY} (or proxy).		0.2
		0.1	2. Stock biomass is below B_{OY} (or proxy) but at or above B_{MSY} (or proxy).		
		0.2	3. Stock biomass is below B_{MSY} (or proxy) but at or above minimum stock size threshold (MSST).	x	
		0.3	4. Stock is overfished, below MSST.		
		0.3	5. Status criterion is unknown.		
Year	Catch	ACL	Over/Under %		
2014	1,618,202	2,279,970	-29%	Assume AM40 allocations	
2015	2,071,733	2,964,000	-30%	Charter For-hire componen	
2016	2,134,005	2,434,000	-12%	Charter For-hire componen	
2017	2,161,704	2,848,000	-24%	Charter For-hire componen	
			No ACL overage in years with sector separation - 0 points		
			ACL exceeded 0 times in last 3 years		
			Data Source: ACL Data set SERO 9 May 2018		

Figure A.1.2: ACL/ACT Control Rule for the for-hire component of the recreational sector for Gulf of Mexico red snapper. 2017 landings are preliminary at the time of this analysis: 9 May 2018.

APPENDIX B: PUBLIC COMMENTS RECEIVED

APPENDIX C. 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 include the Endangered Species Act and Marine Mammals Protection Act (Section 3.3), E.O. 12866 (Regulatory Planning and Review, Chapter 5) and E.O. 12898 (Environmental Justice, Section 3.5.2). Other applicable laws 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.

A summary of NMFS findings is provided in Section 3.2 of this document.

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 listed on, or eligible for listing on, the National Register of Historic Places and aims to minimize damage to such places.

Typically, fishery management actions in the Gulf of Mexico are not likely to affect historic places with exception of the *U.S.S. Hatteras*, located in federal waters off Texas, which is listed in the National Register of Historic Places. Mutton snapper and gag do not typically occur off Texas; therefore, the proposed actions are not likely to increase fishing activity above previous years. Thus, no additional impacts to the *U.S.S. Hatteras* would be expected.

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. 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 mutton snapper and 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.