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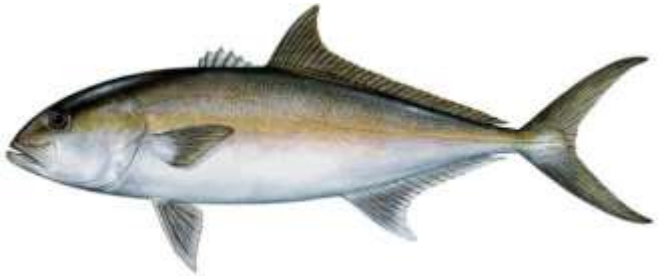
Modifications to Greater Amberjack Allowable Harvest and Rebuilding Plan



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

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

September 2017

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ENVIRONMENTAL ASSESSMENT COVER SHEET

Name of Action

Modifications to Greater Amberjack Allowable Harvest and Rebuilding Plan for the Reef Fish Resources of the Gulf of Mexico, including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis.

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Type of Action

( ) Administrative
( ) Draft

( ) Legislative
(X) Final

ABBREVIATIONS USED IN THIS DOCUMENT

ABC	Acceptable biological catch
ACL	Annual catch limit
ACT	Annual catch target
ALS	accumulated landings system
AMs	Accountability measures
B_{MSY}	stock biomass level capable of producing an equilibrium yield of MSY
Council	Gulf of Mexico Fishery Management Council
CS	consumer surplus
CZMA	Coastal Zone Management Act of 1972
DPS	distinct population segment
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
EJ	Environmental justice
E.O.	Executive Order
ESA	Endangered Species Act
FL	fork length
FMP	Fishery Management Plan
F_{MSY}	fishing mortality rate corresponding to an equilibrium yield of MSY
FTE	full-time equivalent
GSAD	Gulf and South Atlantic Dealer
Gulf	Gulf of Mexico
HAPC	Habitat Area of Particular Concern
IFQ	Individual Fishing Quota
IPCC	Intergovernmental Panel on Climate Change
LCL	lower confidence limits
M	Instantaneous rate of natural mortality
Magnuson-Steven Act	Magnuson-Steven Fishery Conservation and Management Act
MFMT	Maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Survey and Statistics
MRIP	Marine Recreational Information Program
MSST	Minimum stock size threshold
MSY	Maximum sustainable yield
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOR	net operating revenue
NPV	net present values
NRFCC	National Recreational Fisheries Coordination Council
OFL	Overfishing level

Opinion	Biological opinion
OY	Optimum yield
PAH	polyaromatic hydrocarbons
PS	producer surplus
RA	Regional Administrator
RF	Gulf reef fish
RIR	Regulatory impact review
RQ	regional quotient
Secretary	Secretary of Commerce
SEDAR	Southeast Data, Assessment and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SPR	Spawning potential ratio
SRD	Science and Research Director
SRHS	Southeast Region Headboat Survey
SSB	spawning stock biomass
SSBR	Spawning stock biomass per recruit
SSC	Scientific and Statistical Committee
TAC	Total allowable catch
TL	total length
TPWD	Texas Parks and Wildlife Department
UCL	upper confidence limits
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compounds
ww	whole weight

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CHAPTER 1. INTRODUCTION

1.1 Background

Secretarial Amendment 2 (GMFMC 2002) to the Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico (Reef Fish FMP) established a rebuilding plan for Gulf of Mexico (Gulf) greater amberjack (*Seriola dumerili*) based on a stock assessment conducted in 2000 (Turner et al. 2000). The Turner et al. (2000) assessment determined the greater amberjack stock to be overfished and undergoing overfishing as of 1998. Management measures were implemented in January 1997 to reduce the recreational bag limit from three fish to one fish per person per day. In January 1998, a March through May commercial season closure was implemented; however, this closure was not incorporated into the 2000 stock assessment. The projected effects of these management measures were expected to eliminate overfishing; therefore, no new management measures to further restrict effort were implemented. This rebuilding plan was implemented in 2002, and the management measures were expected to rebuild the greater amberjack stock within 7 years (by 2009), well within the maximum time frame of 10 years (by 2012) as specified by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

In 2006, a Southeast Data, Assessment, and Review (SEDAR) update stock assessment was completed that determined the greater amberjack stock was not recovering at the rate previously projected. The stock continued to be overfished and was experiencing overfishing (SEDAR 9 2006). The Gulf of Mexico Fishery Management Council (Council) and National Marine Fisheries Service (NMFS) developed and implemented Amendment 30A in 2008 in response to the stock assessment results and the requirement to end overfishing and rebuild the stock by 2012 (GMFMC 2008a). The minimum reduction required to rebuild the stock by 2012 was 40% of current fishing mortality. The total allowable catch (TAC) implemented by the final rule for Amendment 30A was 1,871,000 lbs whole weight (ww) for 2008 through 2010 (GMFMC 2008a). Amendment 30A also established quotas for the recreational and commercial sectors equal to 1,368,000 and 503,000 lbs ww, respectively. Amendment 30A also required sector-specific accountability measures (AMs) such that if either sector exceeded its allocated portion of the TAC, the Regional Administrator (RA) would close that sector for the remainder of the year. Additionally, if a sector's landings exceed that sector's share of the TAC, the RA would reduce the fishing season by the amount of time necessary to account for the overage in the following fishing year.

A 2010 update stock assessment also determined that the stock remained overfished and was continuing to experience overfishing. In December 2012, Amendment 35 (GMFMC 2012) set the annual catch limits (ACLs) equal to the acceptable biological catch (ABC) and reduced the commercial ACLs, (previously called the TAC), to 1,780,000 lbs ww in an effort to end overfishing and rebuild the stock. The recreational ACL was set at 1,299,000 lbs ww, and a commercial ACL was set at 481,000 lbs ww, based on the sector allocation (73% recreational, 27% commercial) established in Amendment 30A (GMFMC 2008a). Annual catch targets

(ACTs) (equivalent to quotas for greater amberjack) were established at 1,130,000 lbs ww for the recreational sector and 409,000 lbs ww for the commercial sector.

A greater amberjack stock assessment (SEDAR 33 2014) was completed and reviewed by the Council's Scientific and Statistical Committee (SSC) at its June 2014 meeting. The SSC used the ABC Control Rule to recommend the following ABCs for a time period of four years, beginning in 2015, equivalent to 75% of maximum fishing mortality threshold (MFMT), to end overfishing and rebuild the stock:

Year	ABC
2015	1,720,000 lbs ww
2016	2,230,000 lbs ww
2017	2,490,000 lbs ww
2018	2,620,000 lbs ww

In 2015, the Council developed a framework action to reduce the ACL from 1,780,000 lbs ww to the SSC's ABC recommendation of 1,720,000 lbs ww, from 2015 through 2018. These new catch levels were implemented in a final rule that was effective on January 4, 2016. However, the most recent ABC recommendation from the SSC exceeds the current overfishing limit (OFL) established in the 2016 framework actions and requires modification to end overfishing and rebuild the stock.

In 2016, the greater amberjack stock assessment update to SEDAR 33 was completed and reviewed by the SSC at its March 2017 meeting. The SSC accepted the greater amberjack update assessment as the best scientific information available and concluded that greater amberjack was still overfished and undergoing overfishing (Table 1.1.1), and the stock would not be rebuilt by 2019 as previously projected. The SSC provided new annual (OFLs) (Table 1.1.2) and ABCs (Table 1.1.3) for a period of three years, beginning in 2018, equivalent to yield at 75% of the MFMT, based on the results of the update assessment. The results also indicated that Gulf greater amberjack had been overfished in all years since 1987 and has been undergoing overfishing since 1985. These results are generally consistent with the SEDAR 33 benchmark assessment. However, the update assessment produced lower estimates of spawning stock biomass and higher estimates of fishing mortality in the most recent years.

Table 1.1.1. Greater amberjack management advice table from the SEDAR 33 update assessment (2016) and the SEDAR 33 (2014) benchmark assessment.

Criteria	Definitions	SEDAR 33 Update	SEDAR 33
M		0.28	0.28
Steepness		0.85	0.85
Virgin Recruitment	1,000s	2,761	2,827
SSB Unfished		18,779	17,356
	Mortality rate criteria		
F_{MSY} or proxy	$F_{SPR30\%}$	0.20	0.22
MFMT	$F_{SPR30\%}$	0.20	0.22
$F_{CURRENT}$	Geometric mean (F(nyr-3)-nyr)	0.33	0.26
$F_{CURRENT}$/MFMT		1.69	1.15
	Biomass criteria		
SSB_{MSY} or proxy	$SSB_{SPR30\%}$	5,686	4,646
MSST (Mtons)	(1-M)* $SSB_{SPR30\%}$	4,094	3,345
$SSB_{CURRENT}$ (Mtons)	SSB2015	1,640	2,188
$SSB_{CURRENT}/SSB_{SPR30\%}$	SSB2015	0.288	0.47
$SSB_{CURRENT}$/MSST	SSB2015	0.400	0.65
OFL	**Annual yield at MFMT (mp ww) = $F_{SPR30\%}$**		
	OFL 2017	1.243	2.906
	OFL 2018	1.500	2.986
	OFL 2019	1.836	3.068
	OFL 2020	2.167	3.170
	OFL 2021	2.438	3.266
	OFL 2022	2.666	3.344
ABC	**Annual yield at FOY (mp ww) = 75%$F_{SPR30\%}$**		
	ABC 2017	0.936	2.489
	ABC 2018	1.182	2.616
	ABC 2019	1.489	2.730
	ABC2020	1.794	2.852
	ABC 2021	2.057	2.964
	ABC 2022	2.287	3.058
Alternative ABC	**Annual yield (mp ww) = $F_{SPR40\%}$**		
	2017	0.927	2.379
	2018	1.172	2.514
	2019	1.477	2.633
	2020	1.781	2.758
	2021	2.043	2.872
	2022	2.273	2.968

Table 1.1.2. The annual OFLs (mp ww) recommended by the SSC at their March 2017 meeting after review of the SEDAR 33 update assessment (2016). The corresponding OFLs from the previous SEDAR 33 benchmark assessment (2014) are also provided for reference.

OFL (Annual yield at MFMT (mp ww) = $F_{SPR30\%)}$		
Year	SEDAR 33 update	SEDAR 33
2018	1.500	2.986
2019	1.836	3.068
2020	2.167	3.170

Table 1.1.3. The annual ABCs (mp ww) recommended by the SSC at their March 2017 meeting after review of the SEDAR 33 update stock assessment (2016). The corresponding ABCs from the previous SEDAR 33 (2014) benchmark assessment are also provided for reference.

ABC (Annual yield at FOY (mp ww) = 75%$F_{SPR30\%}$		
Year	SEDAR 33 Update	SEDAR 33
2018	1.182	2.616
2019	1.489	2.730
2020	1.794	2.852

This document includes a range of alternatives for adjusting the rebuilding time period and the ABC, to end overfishing and rebuild the stock.

Landings Data

Total annual landings of greater amberjack have ranged from 1.248 mp ww in 1999 to 4.873 mp ww in 1992 (Table 1.1.4). From 2006 through 2016, landings have averaged 1.840 mp ww without trend over this time period (Figure 1.1.1). A summary of landings relative to management targets and season closure dates is in Table 1.1.5 (commercial) and Table 1.1.6 (recreational). The AMs implemented in Amendment 30A (GMFMC 2008a) required that any annual harvest exceeding either the recreational or commercial ACL be deducted from the applicable sector ACL and ACT in the subsequent calendar year. Also, these overage adjustments are made on preliminary landings as final landings are not completed by the beginning of the subsequent calendar year. This may result in minor deviations from the final overage (if any) and the overage deduction.

Table 1.1.4. Commercial and recreational landings of greater amberjack (lbs ww) from 1992 through 2016.

Year	Charter	Headboat	Private	Rec Total	Commercial	Total
1992	1,728,416	312,152	1,941,970	3,982,538	890,553	4,873,091
1993	1,431,707	225,868	766,990	2,424,565	1,042,369	3,466,934
1994	1,160,886	213,119	427,551	1,801,556	851,160	2,652,716
1995	149,963	143,994	458,692	752,649	709,513	1,462,162
1996	643,207	139,588	577,927	1,360,722	830,136	2,190,858
1997	603,131	125,349	354,634	1,083,114	742,136	1,825,250
1998	303,981	88,595	505,851	898,427	496,962	1,395,389
1999	407,926	73,508	360,189	841,623	406,714	1,248,337
2000	570,974	100,732	385,410	1,057,116	785,679	1,842,795
2001	512,556	89,436	791,315	1,393,307	605,285	1,998,592
2002	1,114,754	160,636	857,969	2,133,359	703,303	2,836,662
2003	1,072,018	199,347	1,630,455	2,901,820	857,125	3,758,945
2004	1,068,814	108,769	1,214,647	2,392,230	870,953	3,263,183
2005	365,893	61,281	1,089,981	1,517,155	662,285	2,179,440
2006	1,030,943	79,892	589,351	1,700,186	566,384	2,266,570
2007	516,253	59,436	291,797	867,486	589,235	1,456,721
2008	478,614	54,544	785,504	1,318,662	440,936	1,759,598
2009	653,160	103,191	723,964	1,480,315	601,446	2,081,761
2010	460,740	53,203	711,282	1,225,225	534,095	1,759,320
2011	583,813	62,835	303,351	949,999	508,871	1,458,870
2012	546,086	99,680	592,952	1,238,718	308,334	1,547,052
2013	605,860	73,246	941,655	1,620,761	457,879	2,078,640
2014	333,485	46,435	710,128	1,090,048	486,679	1,576,727
2015	757,327	58,513	591,711	1,407,551	458,693	1,866,244
2016	531,898	20,210	1,410,452	1,962,560	432,573	2,395,133

Source: Southeast Fisheries Science Center recreational (6/7/2017) and commercial (5/2/2017) ACL datasets. Recreational landings exclude Monroe County, Florida.

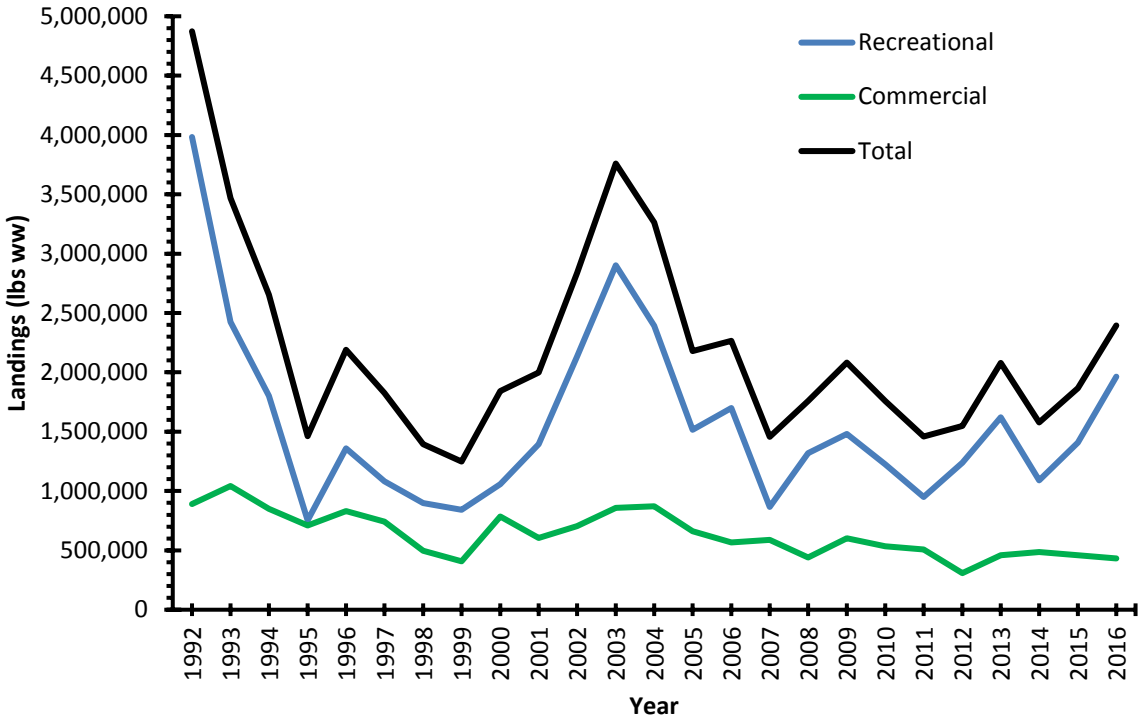

Figure 1.1.1. Recreational, commercial, and total landings (lbs ww) of greater amberjack from 2002 through 2016. Recreational landings were estimates from the Marine Recreational Information Program, Texas Parks and Wildlife Department, LA Creel, and Southeast Region Headboat Surveys.
Source: SEFSC recreational (6/7/2017) and commercial (5/2/2017) ACL datasets.

Table 1.1.5. Summary of recent annual commercial landings relative to management targets (lbs ww).

Commercial						
Year	Landings	ACT	Adjusted ACT	ACL	Adjusted ACL	Closure Date
2008	440,936	503,000				
2009	601,446	503,000				11/7/2009
2010	534,095	503,000	373,072			10/28/2010
2011	508,871	503,000	342,091			6/18/2011
2012	308,334	409,000	237,438	481,000	237,438	3/1/2012
2013	457,879	409,000	338,157	481,000	410,157	7/1/2013
2014	486,679	409,000		481,000		8/25/2014
2015	458,693	409,000		481,000		7/19/2015
2016	432,573	394,740		464,400		7/17/2016

Source: Southeast Fisheries Science Center recreational (6/7/2017) and commercial (5/2/2017) ACL datasets. Recreational landings exclude Monroe County, Florida.

Table 1.1.6. Summary of recent annual recreational landings relative to management targets (lbs ww).

Recreational						
Year	Landings	ACT	Adjusted ACT	ACL	Adjusted ACL	Closure Date
2008	1,318,662			1,368,000		
2009	1,480,315			1,368,000		10/24/2009
2010	1,225,225			1,368,000	1,243,184	
2011	949,999			1,368,000	1,315,224	
2012	1,238,718	1,130,000		1,299,000		
2013	1,620,761	1,130,000		1,299,000		
2014	1,090,048	1,130,000	895,438	1,299,000	1,063,538	8/25/2015
2015	1,407,551	1,130,000		1,299,000		9/28/2015
2016	1,962,560	1,092,372	933,731	1,255,600	1,101,959	6/1/2016

Source: Southeast Fisheries Science Center recreational (6/7/2017) and commercial (5/2/2017) ACL datasets. Recreational landings exclude Monroe County, Florida.

1.2 Purpose and Need

The purpose of this amendment is to adjust the greater amberjack stock rebuilding time period, ACLs and ACTs, and to incorporate updated stock status information from the 2016 SEDAR 33 update assessment. The 2016 SEDAR 33 update assessment determined that greater amberjack continues to be overfished and undergoing overfishing. The need for this amendment is to end overfishing and rebuild the greater amberjack stock in the Gulf.

1.3 History of Management

The **Reef Fish FMP** (with environmental impact statement [EIS]) was implemented in November 1984. The original list of species included in the management unit consisted of snappers, groupers, and sea basses. Gray triggerfish and *Seriola* species, including greater amberjack, were in a second list of species included in the fishery, but not in the management unit. The species in this list were not considered to be target species because they were generally taken incidentally to the directed fishery for species in the management unit. Their inclusion in the Reef Fish FMP was for purposes of data collection, and their take was not regulated.

Amendment 1 (with environmental assessment [EA]) implemented in 1990, added greater amberjack and lesser amberjack to the list of species in the management unit. It set a greater amberjack recreational minimum size limit of 28 inches fork length (FL), a 3-fish recreational bag limit, and a commercial minimum size limit of 36 inches FL. This amendment's objective was to stabilize the long-term population levels of all reef fish species. A framework procedure for specification of TAC was created to allow for annual management changes. This amendment also established a commercial vessel reef fish permit as a requirement for harvest in excess of the bag limit and for the sale of reef fish.

Amendment 4 (with EA), implemented in 1992, added banded rudderfish and almaco jack to the management unit, and established a moratorium on the issuance of new commercial reef fish vessel permits for a maximum period of 3 years.

Amendment 5 (with supplemental EIS), implemented in 1994, required that all finfish, except for oceanic migratory species, be landed with head and fins attached, and closed the region of Riley's Hump (near Dry Tortugas, Florida) to all fishing during May and June to protect mutton snapper spawning aggregations

Amendment 12 (with EA), submitted in 1995 and implemented in 1997, reduced the greater amberjack bag limit from three fish to one fish per person, and created an aggregate bag limit of 20 reef fish for all reef fish species not having a bag limit (including lesser amberjack, banded rudderfish, almaco jack and gray triggerfish). NMFS disapproved proposed provisions to include lesser amberjack and banded rudderfish along with greater amberjack in an aggregate one-fish bag limit and to establish a 28-inch FL minimum size limit for those species.

Amendment 15 (with EA), implemented in 1998, closed the commercial sector for greater amberjack in the Gulf during the months of March, April, and May.

A Regulatory Amendment (with EA), implemented in 1999, closed two areas (i.e., created two marine reserves), 115 and 104 square nautical miles respectively, year-round to all fishing under the jurisdiction of the Council with a 4-year sunset clause.

Generic Sustainable Fisheries Act Amendment (with EA), partially approved and implemented in 1999, set the MFMT for greater amberjack at the fishing mortality necessary to achieve 30% of the unfished spawning potential F30% SPR. Estimates of maximum sustainable yield (MSY), minimum stock size threshold (MSST), and optimum yield (OY) were disapproved because they were based on spawning potential ratio (SPR) proxies rather than biomass-based estimates.

Secretarial Amendment 2 (with EIS), implemented in 2003, specified MSY for greater amberjack as the yield associated with $F_{30\% SPR}$ (proxy for F_{MSY}) when the stock is at equilibrium, OY as the yield associated with an $F_{40\% SPR}$ when the stock is at equilibrium, MFMT equal to $F_{30\%SPR}$, and MSST equal to (1-M)*B_{MSY} (where M = natural mortality) or 75% of B_{MSY}. It also set a rebuilding plan limiting the harvest to 2,900,000 lbs for 2003-2005, 5,200,000 lbs for 2006-2008, 7,000,000 lbs for 2009-2011, and for 7,900,000 lbs for 2012. This was expected to rebuild the stock in 7 years. Regulations implemented in 1997 and 1998 (Amendments 12 and 15 to the Reef Fish FMP) were deemed sufficient to comply with the rebuilding plan so no new regulations were implemented.

Amendment 30A (with EIS), implemented in 2008, was developed to stop overfishing of gray triggerfish and greater amberjack. The amendment established ACLs and AMs for greater amberjack and gray triggerfish. For greater amberjack, the rebuilding plan was modified, increasing the recreational minimum size limit to 30 inches FL, implementing a zero bag limit for captain and crew of for-hire vessels, and setting commercial and recreational ACTs (quotas). **Amendment 30A** also established an allocation for greater amberjack harvest of 73% recreational and 27% commercial, which would be in effect until such time that the Council, through the recommendations of an Ad Hoc Allocation Committee, could implement a separate amendment that fairly and equitably allocated Reef Fish FMP resources between recreational and commercial sectors.

A Regulatory Amendment (with EA), implemented in 2011, specified the greater amberjack recreational closed season from June 1 – July 31. The intended effect of this final rule was to mitigate the social and economic impacts associated with implementing in-season closures.

Amendment 35 (with EA), implemented in 2012 in response to a 2010 update stock assessment, established a new ACL equal to the ABC at 1,780,000 lbs, which was less than the current ACL of 1,830,000 lbs. Reducing the ABC by 18% was expected to end overfishing. The rule also established a commercial trip limit of 2,000 lbs ww throughout the fishing year. The Council also considered bag limits and closed season management measures for the recreational sector but did not alter any recreational management measures.

2015 Framework Amendment (with EA), implemented in 2016 decreased the total ACL from 1,780,000 lbs to 1,720,000 lbs, set the commercial ACL at 464,400 lbs and the commercial ACT

(quota) at 394,740 lbs, set the recreational ACL at 1,255,600 lbs and the recreational ACT (quota) at 1,092,372 lbs, reduced the commercial trip limit from 2,000 lbs to 1,500 lbs, and increased the recreational minimum size limit from 30 inches FL to 34 inches FL.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 – Modify the Greater Amberjack Rebuilding Time Period, Annual Catch Limits, and Annual Catch Targets

Note: Commercially harvested greater amberjack are typically landed gutted rather than whole. However, the management alternatives in this action are stated in pounds whole weight (ww) consistent with current federal regulations and sector allocations. The National Marine Fisheries Service (NMFS) published a reminder July 29, 2014 (FB14-55) clarifying that one pound gutted weight of greater amberjack is equivalent to 1.04 lbs ww using the standard conversion.

The current allocation for greater amberjack is 73% to the recreational sector and 27% to the commercial sector (GMFMC 2008a).

Alternative 1: No Action – Maintain the current ACLs and ACTs (quotas). The stock is not projected to rebuild with these ACLs.

		Recreational		Commercial	
Year	ABC	ACL	ACT	ACL	ACT
2015 +	1,720,000	1,255,600	1,092,372	464,400	394,740

Preferred Alternative 2: Set the combined ACLs equal to the ABC recommended by the Scientific and Statistical Committee (SSC) from 2018 through 2020+, based upon the Southeast Data, Assessment, and Review (SEDAR) 33 Update Assessment (2016). This alternative is projected to rebuild the stock by 2027.

Preferred Option a. Apply the ACL/ACT Control Rule (landings from 2013 through 2016) to establish a 13% buffer to the commercial sector and a 17% buffer to the recreational sector.

		Recreational		Commercial	
Year	ABC	ACL	ACT	ACL	ACT
2018	1,182,000	862,860	716,173	319,140	277,651
2019	1,489,000	1,086,970	902,185	402,030	349,766
2020+	1,794,000	1,309,620	1,086,985	484,380	421,411

Option b. Do not use the ACL/ACT Control Rule to set ACTs. The quotas will be equal to the ACLs.

		Recreational		Commercial	
Year	ABC	ACL	ACT	ACL	ACT
2018	1,182,000	862,860		319,140	
2019	1,489,000	1,086,970		402,030	
2020+	1,794,000	1,309,620		484,380	

Alternative 3: Set the combined ACLs equal to the lowest ABC level recommended by the SSC for 2018+. This alternative is projected to rebuild the stock by 2024.

Option a. Retain the ACL/ACT Control Rule (landings from 2013 through 2016) to establish a 13% buffer to the commercial sector and 17% buffer to the recreational sector.

		Recreational		Commercial	
Year	ABC	ACL	ACT	ACL	ACT
2018 +	1,182,000	862,860	716,173	319,140	277,651

Option b. Do not use the ACL/ACT Control Rule to set ACTs. The quotas will be equal to the ACLs.

		Recreational		Commercial	
Year	ABC	ACL	ACT	ACL	ACT
2018 +	1,182,000	862,860		319,140	

Alternative 4: Set the combined ACLs at zero (i.e., no allowable harvest). This alternative is projected to rebuild the stock by 2022.

Discussion

The SSC reviewed the SEDAR 33 Update Assessment (2016) and determined that the greater amberjack stock remains overfished and is experiencing overfishing as of 2015, the terminal year of data in the assessment. Action 1 includes alternatives to adjust the rebuilding time period by modifying the overfishing limit (OFL), acceptable biological catch (ABC), ACLs, and ACTs for greater amberjack based on the SEDAR 33 Update Assessment (2016) and subsequent SSC review. The 2015 Framework Action (GMFMC 2015) established an ABC of 1,720,000 lbs, which exceeds the current SSC recommendation for ABC of 1,182,000 lbs for 2018. The 2015 framework action also established a four-year rebuilding time period.

Greater amberjack are currently managed toward harvesting the ACT (quota) for both the recreational and commercial sectors. This strategy provides a management buffer between the ACT and ACL, ultimately reducing the likelihood of exceeding the ACL and triggering accountability measures (AMs). The Gulf of Mexico Fishery Management Council (Council)

established an ACL/ACT Control Rule in the Generic ACL/AM Amendment (GMFMC 2011) to objectively and efficiently assign catch limits and targets that take management uncertainty into account. The rule uses different levels of information about catch levels, sector overages, stock management practices, and data quality to assign levels of reduction for either sector ACLs or ACTs.

Alternative 1 (No Action) would retain the current rebuilding time period, as well as the current ABC and ACL, which are equal to the SSC's ABC recommendation for 2015. The ABC was set at the lowest level recommended by the SSC at its June 2014 meeting for 2015 through 2018. The ACL/ACT Control Rule was applied, resulting in a commercial buffer of 15% and a recreational buffer of 13%. This alternative was projected to rebuild the stock by 2019. However, the most recent stock assessment (SEDAR 33 Update 2016) indicates that the stock remains overfished and undergoing overfishing and will not rebuild by 2019.

Preferred Alternative 2 would set the combined recreational and commercial ACLs equal to the ABC most recently recommended by the SSC, for 2018 through 2020+, and is projected to rebuild the stock by 2027. **Preferred Alternative 2** would also establish a new ABC of 1,182,000 lbs for 2018. This would be 538,000 lbs less than the current ABC (1,720,000 lbs). Under **Preferred Alternative 2**, the ABC would increase to 1,489,000 lbs in 2019, and 1,794,000 lbs in 2020 and remain at the 2020 level thereafter, until a new ABC is provided by the SSC. Based on the allocation (73% recreational and 27% commercial), the sector ACLs for 2018 would be 862,860 lbs for the recreational sector and 319,140 lbs for the commercial sector. Additionally, **Preferred Option a** uses the updated ACL/ACT Control Rule, with landings from 2013 through 2016, to establish the sector ACTs, and results in a 13% commercial buffer and a 17% recreational buffer. **Option b** would remove the sector ACTs as management targets and establish the sector ACLs as the quotas. **Preferred Alternative 2** is projected to rebuild the stock by 2027. **Preferred Alternative 2** would reduce the allowable harvest, as compared to **Alternative 1,** and would allow the same harvest as **Alternative 3** in 2018. In 2019 and beyond, the allowable harvest under **Preferred Alternative 2** would exceed **Alternative 3,** however, the time to rebuild the stock would be increased by 3 years as compared to **Alternative 3**. While **Preferred Alternative 2** would lengthen the rebuilding time period in comparison to **Alternative 3** by 3 years, and **Alternative 4** by 5 years, this would allow an increased allowable harvest as the stock biomass increases throughout the rebuilding, and may allow consistent access that could otherwise be reduced if catch rates and/or mean size increase during rebuilding.

Alternative 3 would set a constant catch ABC at 1,182,000 lbs, which was the lowest level recommended by the SSC at their March 2017 meeting for the years 2018-2020, based upon the SEDAR 33 Update Assessment (2016). **Option a** would apply the ACL/ACT Control Rule buffer resulting in a 13% commercial buffer and a 17% recreational buffer = 17%. Under **Option a,** the recreational ACL for 2018+ equals 862,860 lbs (ACT = 716,173 lbs), and the commercial ACL equals 319,140 lbs (ACT = 277,651 lbs). **Option b** would remove the ACT as a management target, establish a recreational ACL equal to 862,860 lbs ww, and a commercial ACL equal to 319,140 lbs. **Alternative 3** is projected to rebuild the stock by 2024.

Alternative 4 would set the commercial and recreational ACLs and ACTs at zero and is projected to rebuild the stock by 2022. A new stock assessment is to be completed in 2022 or later, and the SSC would determine if the stock has rebuilt and provide recommendations for a revised overfishing limit (OFL) and ABC based on this assessment. However, the absence of landings from a directed fishery would make it difficult to conduct a traditional stock assessment, since fishery-dependent data would not be available. A fishery-independent sampling program would be desirable during the closed period to provide the information needed to be able to conduct a future assessment. In addition, a prohibition of harvest would be extremely disruptive to the reef fish fishery, and a sampling of discards from other target fisheries would be required to estimate discard mortality.

2.2 Action 2 – Modify the Recreational Closed Season for Greater Amberjack

Alternative 1: No Action – Do not modify the current June 1 - July 31 recreational closed season.

Alternative 2: Modify the recreational closed season to be March 1 – May 31.

Alternative 3: Modify the recreational closed season to be March 1 – June 30.

Preferred Alternative 4: Modify the recreational closed season to be January 1 – June 30.

Alternative 5: Modify the recreational closed season to be January 1 – July 31.

Discussion

At its August 2017 meeting, the Council discussed the alternatives in Action 2 that would modify the recreational closed season, with the goal of balancing access to greater amberjack, and achieving the harvest reductions necessary to end overfishing and rebuild the stock. The Council determined that further deliberation is necessary to determine the most appropriate recreational closed season but did not want to delay implementation of the harvest reductions. Thus, the Council selected **Preferred Alternative 4,** which would prevent the recreational season from opening on January 1, 2018, and allow additional time to consider the most appropriate recreational closed season. The Council intends to develop a subsequent management action that may modify the January 1 – June 30 closed season selected under **Preferred Alternative 4**.

Alternative 1 would maintain the current June 1 – July 31 fixed closed season. This fixed recreational closed season was originally put in place to reduce the likelihood of an in-season quota closure and to allow greater amberjack to be harvested when recreational red snapper harvest was prohibited. Both red snapper and greater amberjack are a frequently targeted and prized species, thus, anglers want the opportunity to harvest one of these species. Because the recreational fishing season for red snapper begins on June 1, a June 1 fixed season closure date for greater amberjack would mean that the red snapper fishing season would open when the greater amberjack fishing season closed. Thus, anglers would have the opportunity to harvest one of these targeted species during the summer months. However, this has become more complex, since the red snapper recreational sector is now composed of private angling and for-hire components, with separate fishing seasons for each component. For 2017, the for-hire component's red snapper season was 49 days (June 1 – July 19). The private angling season was initially established as a 3-day season (June 1 – June 3). On June 14, 2017, the private angling recreational red snapper season re-opened for 39 weekend days and holidays in 2017. In addition, although **Alternative 1** retains a greater amberjack fixed recreational closed season during the months with the greatest fishing effort historically, it is not expected to eliminate an in-season quota closure.

Alternative 2 would establish a March 1 through May 31 recreational fixed closed season. **Alternative 2** would be consistent with the commercial closed season and would reduce fishing mortality during greater amberjack peak spawning months, which occurs throughout most of the Gulf of Mexico (Gulf) during March and April (Wells and Rooker 2002; Murie and Parkyn 2008; SEDAR 33 2014), but was found to occur around the Florida Keys during April and May (Harris et al. 2007). However, the June 1 re-opening coincides with the red snapper season, opening when effort and harvest is estimated to be highest. Further, the greater amberjack recreational season would likely have to be closed prior to year-end when the ACT is projected to be reached. Season length is, in part, determined by the ABC, sector ACLs, and sector ACTs selected in **Action 1**.

Alternative 3 would establish a recreational fixed closed season from March 1 through June 30. This alternative would encompass the commercial fixed closed season (March - May) but includes an additional month (June) to prevent harvest of greater amberjack during a period of historically high effort. **Alternative 3** would establish a longer fixed season closure than **Alternative 1** or **Alternative 2** but could provide more total fishing days each year than **Alternative 1** or **Alternative 2,** since the season would occur during periods of lower historical effort.

Preferred Alternative 4 would establish a recreational fixed closed season from January 1 through June 30. This would establish a longer fixed closed season than **Alternatives 1**, **2**, and **3**. Similar to **Alternatives 2** and **3**, **Preferred Alternative 4** would reduce fishing mortality during the peak spawning season around the Gulf, including the Florida Keys, and is estimated to extend the fishing season later in the year, in comparison to **Alternatives 1-3**. While allowing for a longer end of year season and protecting the stock during peak spawning, **Preferred Alternative 4** would eliminate a spring season.

Alternative 5 would establish a recreational fixed closed season from January 1 through July 31, the longest fixed closed season of the alternatives considered. Similar to **Alternatives 2-3**, and **Preferred Alternative 4**, **Alternative 5** would reduce fishing mortality during the peak spawning season and is estimated to extend the fishing season later in the year, compared to **Alternatives 1-3** and **Preferred Alternative 4**. As with **Preferred Alternative 4**, **Alternative 5** would also prohibit harvest during the spring, but recreational anglers would not be expected to harvest the entire recreational ACL or ACT, based on the alternatives in Action 1.

A decision support tool was developed to evaluate the alternatives in Actions 1 and 2 relative to the expected length (days) of the recreational fishing season (Table 2.2.1). Each alternative in Action 1 is compared to the potential fixed closed seasons in Action 2. While the season lengths for Alternative 1 in Action 1 are provided for reference, the ACL in Alternative 1 exceeds the current SSC recommendation and is not a viable alternative. Season lengths for Action 1 Alternative 4 are also provided for reference, although that alternative would prohibit harvest, making seasonal closure choices irrelevant. For Action 1, Preferred Alternative 2, Option a and Alternative 3, Option a would retain the ACT as the management target, while Alternatives 2 Option b and Alternative 3 Option b would remove the ACT as the management target, and establish the ACL as the management targets. In Action 1, both Alternatives 2 and 3, Option b

would have a longer recreational season than Option a for each closed season alternative in Action 2. In terms of season length, the longest predicted season in fishing days would be achieved with a March 1 - June 30 closed season (Action 2, **Alternative 3**), with the selection of Alternative 1 in Action 1 (244 days). An ACT closure is also not predicted under these Alternative selections. However, the selection of Alternative 1 in Action 1, and any Action 2 alternative combination would not allow the greater amberjack stock to rebuild by 2019, as originally expected. Action 2 **Alternatives 2**, **3**, **5**, and **Preferred Alternative 4** would prevent harvest during the peak spawning season and should extend the season until early October under Action 1, Alternative 2, Option a (Preferred) and Alternative 3, Option a; or late November under Action 1, Alternatives 2 and 3, Option b, with the selection of Action 2, **Preferred Alternative 4**. **Preferred Alternative 4** would still require a season closure before the end of the year (Option a - Oct. 2; Option b - Nov. 24) to constrain harvest to the management target. **Alternative 5** would allow the season to remain open for the remainder of the fishing year. However, the expected season length would not be long enough to harvest the ACT or ACL established under the alternatives in Action 1. All alternatives, except for Action 2 **Alternative 1,** prohibit harvest of greater amberjack during peak spawning in the Gulf (Sedberry et al. 2006; Harris et al. 2007).

Table 2.2.1. Combined effects of ACL/ACT alternatives (Action 1) and recreational season closure alternatives (Action 2).

Action 1: ACL/ACT	Action 2: Seasonal Closure	Predicted Quota Closure	Estimated Season Length (days)
Alternative 1	Alt 1: June 1-July 31	9-Aug	160
	Alt 2: March 1-May 31	29-Sep	181
	Alt 3: March 1-June 30	NONE	244
	Preferred Alt 4: Jan. 1-June 30	NONE	184
	Alt 5: Jan. 1-July 31	NONE	153
Preferred Alternative 2 Option a	Alt 1: June 1-July 31	29-Apr	119
	Alt 2: March 1-May 31	4-Aug	125
	Alt 3: March 1-June 30	6-Sep	128
	Preferred Alt 4: Jan. 1-June 30	2-Oct	94
	Alt 5: Jan. 1-July 31	NONE	153
Alternative2 Option b	Alt 1: June 1-July 31	15-May	135
	Alt 2: March 1-May 31	19-Aug	140
	Alt 3: March 1-June 30	10-Oct	162
	Preferred Alt 4: Jan. 1-June 30	24-Nov	147
	Alt 5: Jan. 1-July 31	NONE	153
Alternative 3 Option a	Alt 1: June 1-July 31	29-Apr	119
	Alt 2: March 1-May 31	4-Aug	125
	Alt 3: March 1-June 30	6-Sep	128
	Preferred Alt 4: Jan. 1-June 30	2-Oct	94
	Alt 5: Jan. 1-July 31	NONE	153
Alternative 3 Option b	Alt 1: June 1-July 31	15-May	135
	Alt 2: March 1-May 31	19-Aug	140
	Alt 3: March 1-June 30	10-Oct	162
	Preferred Alt 4: Jan. 1-June 30	24-Nov	147
	Alt 5: Jan. 1-July 31	NONE	153
Alternative 4	Alt 1: June 1-July 31	N/A	0
	Alt 2: March 1-May 31	N/A	0
	Alt 3: March 1-June 30	N/A	0
	Preferred Alt 4: Jan. 1-June 30	N/A	0
	Alt 5: Jan. 1-July 31	N/A	0

Source: NMFS-SERO. Gulf_GAJ_rec_decision_Tool_May2017_v8.xlsm

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 Description of the Fishery

3.1.1 Commercial Sector

Commercial landings from the reef fish fishery account for approximately 6% of all finfish and shellfish landings in the Gulf of Mexico (Gulf). From 2010 to 2015, 531 to 577 vessels had landings from the fishery annually. Commercial fishing vessels that harvest reef fish from the Gulf exclusive economic zone (EEZ) must possess a federal Gulf reef fish commercial permit, which is a limited access permit. As of July 10, 2017, a total of 839 vessels possess a reef fish commercial permit (788 valid and 51 renewable). Approximately 98% of the permits list a mailing recipient in a Gulf state (Table 3.1.1).

Table 3.1.1.1. Number and percentage of vessels with Gulf reef fish permit by state as of July 10, 2017.

State	Gulf Reef Fish Permits	
	Number	Percent
Alabama	36	4.3%
Florida	667	79.5%
Louisiana	38	4.5%
Mississippi	7	0.8%
Texas	75	8.9%
Subtotal	**823**	**98.1%**
Other	16	1.9%
Total	**839**	**100.0%**

Source: NMFS SERO Permits website

Greater amberjack management measures for fish harvested commercially include a 36 inch fork length (FL) minimum size limit, a trip limit of 1,500 lbs gutted weight, a fixed season closure from March 1-May 31, and accountability measures. These accountability measures state that if commercial landings reach, or are projected to reach the annual catch target (ACT) (commercial quota), the commercial sector will close for the remainder of the fishing year. In addition, if commercial landings exceed the commercial annual catch limit (ACL), the commercial ACT (quota) and the commercial ACL will be reduced for the following fishing year by the amount of the overage in the prior fishing year.

Hook-and-line has been the predominant gear in the commercial harvest of greater amberjack, accounting for approximately 75% of total landings from 1992 through 2016; longlines accounted for approximately 7%; and other gear types (e.g., diving, nets) accounted for the rest (SEFSC Commercial ACL Data Set July 2017). While commercial landings records have been required since 1984 (GMFMC 1981), regular and more complete logbook reporting did not begin until the early 1990s. Greater amberjack historically has been a relatively minor component of

total reef fish commercial landings in the Gulf. Landings were less than 300,000 lbs until 1983, but since then have increased annually with a peak of 1,730,386 million pounds (mp) in 1992 and declined overall thereafter. Greater amberjack landings declined from 1998-1999, which can in part be attributed to an annual Gulf-wide closure that was implemented for the commercial sector during the months of March, April, and May in 1998. Recent records show landings at half of what they once were historically (Figure 3.1.1). Landings have stayed within a 200,000-lb variance since 2007 except for a sharp decline seen in 2012, which can be partially attributed to a reduction in the ACL in 2012. From 2010-2016, the majority of greater amberjack, 49.6%, were commercially harvested in waters adjacent to Florida. The commercial season for greater amberjack has not been open for the full fishing year since 2008. Commercial harvest reached its quota before the end of the 2009 season and in all seasons since. Paybacks for overages and subsequent in-season closures occurring earlier in the year have occurred from 2010 to present.

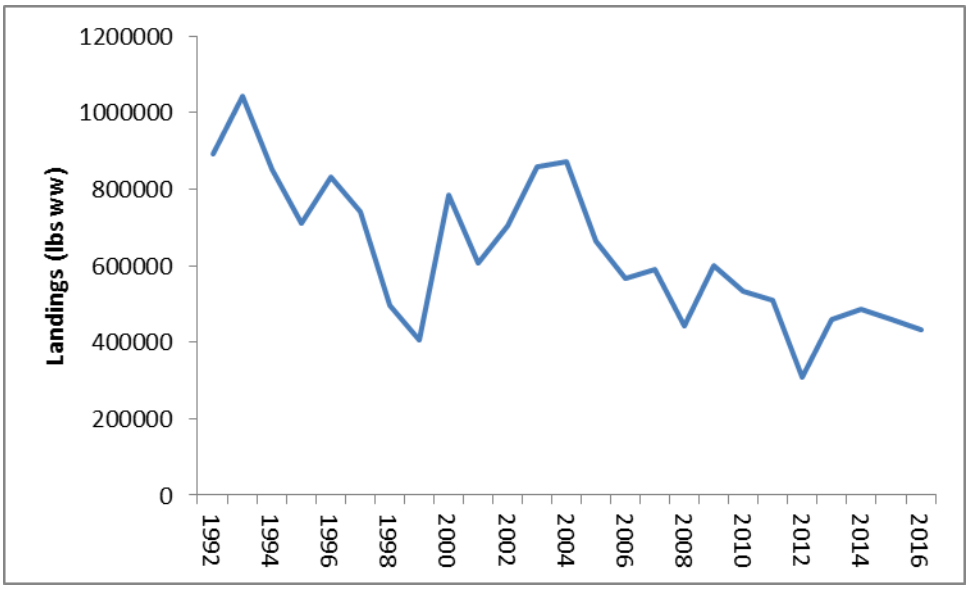

Figure 3.1.1.1. Commercial landings (lbs ww) of greater amberjack from 1992 through 2016.
Source: SEFSC recreational (6/7/2017) ACL datasets.

3.1.2 Recreational Sector

Recreational anglers fish through a variety of fishing modes which are classified generally as shore, private/rental, charter vessels, and headboats (party boats). The latter two comprise the for-hire component of the recreational sector. Although charter vessels tend to be smaller, on average, than headboats, the main distinction between the two types of operations is that charter vessels charge by the trip, regardless of how many passengers are carried, whereas headboats charge per individual angler.

The National Marine Fisheries (NMFS) does not require a recreational permit for private angling of reef fish in federal waters of the Gulf, although states each require their own recreational fishing license while in their respective state waters. However, a federal charter vessel/headboat

permit for reef fish (for-hire permit) has been required to take paying passengers fishing in federal waters since 1996. The component currently operates under a limited access system (GMFMC 2005b). The for-hire permit does not distinguish between charter vessels and headboats, though information on the primary method of operation is collected on the permit application form. Some vessels may operate as both a charter vessel and a headboat, depending on the season or purpose of a trip. On July 10, 2017, there were 1,311 vessels with a valid (non-expired) or renewable Gulf for-hire permit for reef fish (including historical captain permits). A permit in renewable status is an expired limited access permit that may not be actively fished, but is renewable for up to one year after expiration. Additionally, 126 of these vessels had a Gulf commercial reef fish permit and are referred to as dual-permitted vessels.

Greater amberjack management measures for fish harvested recreationally include a 34-inch FL minimum size limit, a bag limit of one fish per person per day, a fixed seasonal closure from June 1-July 31, a zero bag limit for captain and crew of for-hire vessels, and accountability measures. These accountability measures require an in-season closure of further harvest for the remainder of the calendar year, if recreational landings reach, or are projected to reach the ACT. In addition, if recreational landings exceed the recreational ACL, the recreational ACT and the recreational ACL will be reduced for the following fishing year by the amount of any recreational ACL overage in the prior fishing year.

The primary gear used in the recreational sector is handlines with the occasional electric reel. Some harvest is conducted by spear, although it is only a small percentage. Private recreational landings of greater amberjack began being reported in 1979 with the Marine Recreational Fisheries Statistics Survey (MRFSS), although landings in 1979 and 1980 have been considered unreliable. In later years, recreational landings have been provided by the Marine Recreational Information Program (MRIP), the Southeast Region Headboat Survey (SRHS), the Texas Parks and Wildlife Department (TPWD), and the Louisiana Creel Survey. Landings peaked in 1986 at approximately 7.5 mp, but have been well below this level in subsequent years. Recreational landings from 1992 through 2016 averaged approximately 1.5 mp (Figure 3.1.2.1). Private landings have generally had a stable increasing and decreasing pattern with sharp increases seen around every ten years. Sharp declines can be seen in 2011, which are likely attributed to the 2010 *Deepwater Horizon MC252* oil spill, and in 2014, which can be attributed to a new ACT being set, and accountability measures requiring a closure when that recreational quota is met or projected to be met.

While accountability measures require the closure of the fishing season when the recreational quota is met or projected to be met, the time estimation of when this will occur is not always easily predicted. Projected closures and subsequent payback of the ACL overage in the following fishing years have led to a cycle of the ACL being exceeded in 2015 and 2016. The 2017 recreational fishing season was shorter than expected due to the large quota overage in 2016. Landings data for 2017 are still preliminary so it is still unknown if the ACL was exceeded for this fishing year. For the years 1992-2016, the private angler fishing mode has been the dominant fishing mode, accounting for approximately 48% of total recreational landings of greater amberjack, followed by charterboats (45%) and headboats (7%). From 2010-2016, the majority of greater amberjack, 88.8%, were recreationally harvested in waters adjacent

to Florida and Alabama. The recreational season for greater amberjack has not been open for the full fishing year since 2013. Fishing seasons have gotten shorter by earlier closures since 2014. There was a payback in 2014, and recreational harvest was projected to reach its ACT, and therefore closed, before the end of the 2014 season. While there was not a payback in 2015, harvest was projected to reach its ACT before the end of the fishing year and was closed early. An overage of the ACL occurred and a payback was required on the 2016 fishing year, which also closed early. Even with a June closure in 2016, a large overage of the ACL occurred. This resulted in the shortest recreational season to date in 2017. The season closed in March 2017.

Figure 3.1.2.1. Recreational private and for-hire landings (lbs ww) of greater amberjack from 1992 through 2016. Recreational landings were estimates from the Marine Recreational Information Program, Texas Parks and Wildlife Department, Louisiana Creel, and Southeast Region Headboat Surveys.
Source: SEFSC recreational (6/7/2017) ACL datasets.
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3.2 Description of the Physical Environment

The Gulf has a total area of approximately 600,000 square miles (1.5 million km^2), including state waters (Gore 1992). It is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel (Figure 3.2.1). Oceanographic conditions are affected by the Loop Current, discharge of freshwater into the northern Gulf, and a semi-permanent, anti-cyclonic gyre in the western Gulf. The Gulf includes both temperate and tropical waters (McEachran and Fechhelm 2005). Mean annual sea surface temperatures ranged from 73 through 83º F (23-28º C) including bays and bayous (Figure 3.2.1) 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.

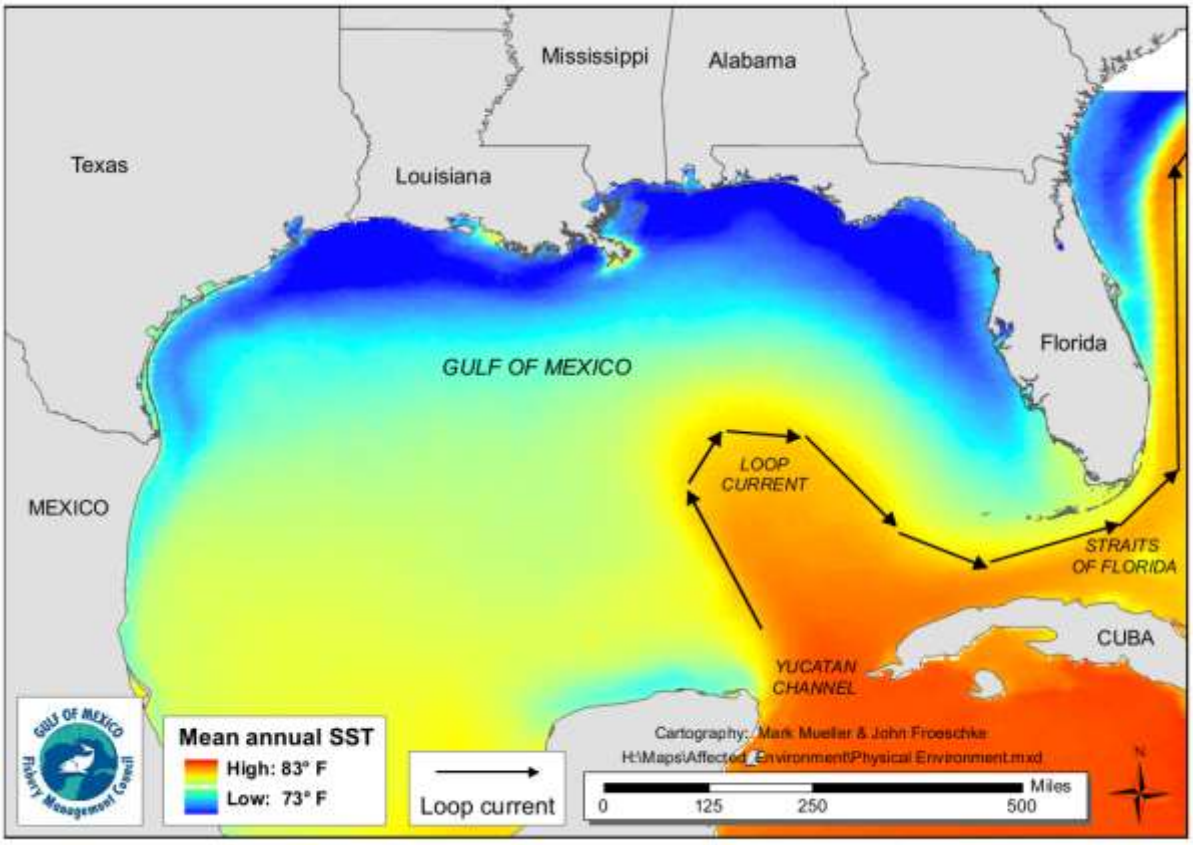

Figure 3.2.1. Mean annual sea surface temperature derived from the Advanced Very High Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (http://pathfinder.nodc.noaa.gov).

The physical environment for Gulf reef fish is detailed in the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004) and the Generic ACL/Accountability Measure (AM) Amendment (GMFMC 2011), which are hereby incorporated by reference.

Habitat Areas of Particular Concern (HAPC)

Generic Amendment 3 (GMFMC 2005a) for addressing EFH, HAPC, and adverse effects of fishing in the following fishery management plans, including the Gulf Reef Fish Resources, Red Drum, and Coastal Migratory Pelagics, and is hereby incorporated by reference.

Environmental Sites of Special Interest Relevant to Reef Fish, Red Drum, Coastal Migratory Pelagics, and Red Drum. (Figure 3.2.2)

Longline/Buoy Gear Area Closure – Permanent closure to use of these gears for reef fish harvest inshore of 118 feet (36.6 meters) off the Florida shelf and inshore of 293 feet (91.4 meters) for the remainder of the Gulf, and encompasses 72,300 square nautical miles (nm^2) or 133,344 km^2 (GMFMC 1989). Bottom longline gear is prohibited inshore of 35 fathoms (54.3 meters) during

the months of June through August in the eastern Gulf (GMFMC 2009), but is not depicted in Figure 3.2.2.

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

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

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

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

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

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

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

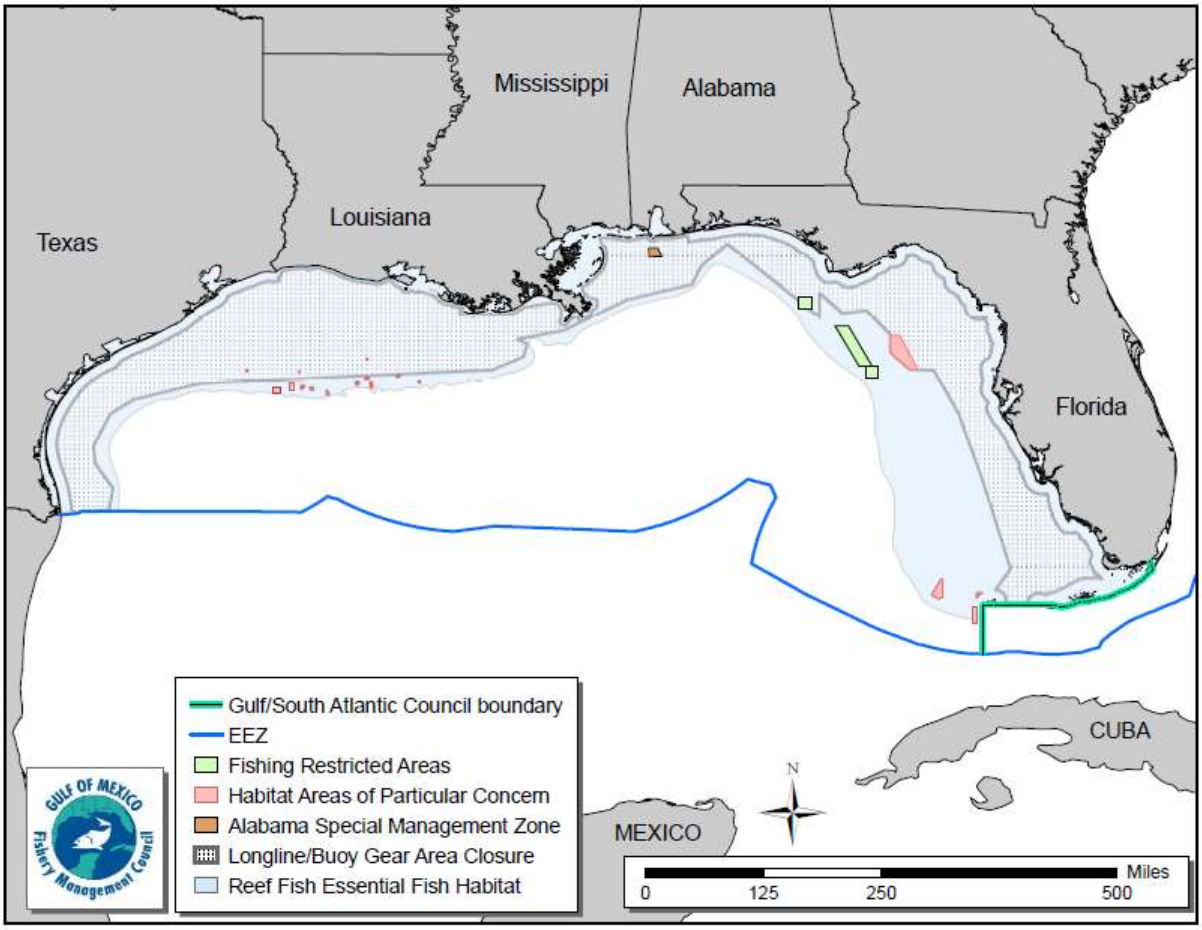

Figure 3.2.2. Map of most fishery management closed areas in the Gulf of Mexico.

Deepwater Horizon MC252

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

Surface or submerged oil during the *Deepwater Horizon MC252* event could have restricted the normal processes of atmospheric oxygen mixing into and replenishing oxygen concentrations in the water column, thus affecting the long-standing hypoxic zone located west of the Mississippi River on the Louisiana continental shelf. In addition, microbes in the water that break down oil and dispersant also consume oxygen, which could lead to further oxygen depletion. Zooplankton

that feed on algae could also be negatively impacted, thus allowing more of the hypoxia-fueling algae to grow.

3.3 Description of the Biological/Ecological Environment

Greater Amberjack Life History and Biology

Seasonal aspects of reproduction

Recent studies conducted in the South Atlantic have estimated that greater amberjack peak spawning occurs in April and May (Sedberry et al. 2006; Harris et al. 2007); whereas, studies conducted in the Gulf have estimated that peak spawning occurs a month earlier during March and April (Wells and Rooker 2002; Murie and Parkyn 2008). There is also evidence for separate and limited connectivity of the greater amberjack population structure within the Gulf, where the northern Gulf population does not appear to mix often with the Florida Keys population (Gold and Richardson 1998, Murie et al. 2011).

Sedberry et al. (2006) documented greater amberjack spawning in the south Atlantic on both the middle and outer shelf as well as on upper-slope reefs from 49 - 709 ft (15 - 216 m) depth, but spawning females were found at deeper depths from 148 - 400 ft (45 - 122 m). They collected spawning females from January to June, and estimated peak spawning occurred in April and May. Harris et al. (2007) provided information on reproduction in the southeastern U.S. Atlantic using fishery-dependent and fishery-independent samples from 2000 - 2004. Greater amberjack in spawning condition were captured from North Carolina to the Florida Keys; however, spawning was concentrated in areas off south Florida and the Florida Keys. Harris et al. (2007) documented evidence of spawning from January - June with peak spawning during April and May.

Early studies on greater amberjack conducted in south Florida indicated that maximum gonad development occurred in the spring months (Burch 1979), although larvae and small juveniles were reported year round in the entire Gulf (Aprieto 1974). Wells and Rooker (2002) conducted studies in the northwestern Gulf on larval and juvenile fish associated with floating *Sargassum*. Based on the size and season when larvae and juvenile greater amberjack were captured, they suggested peak spawning season occurred in March and April, although they did find that peak spawning began as early as February off Texas. Murie and Parkyn (2008) provided updated information on reproduction of greater amberjack throughout the Gulf using fishery-dependent as well as fishery-independent data from 1989-2008. (It is important to note that fishery-dependent sampling has not been year round). They reported peak spawning occurring during March and April, and by May, they documented low gonad weights indicating spawning was ending.

Size aspects of reproduction

Female greater amberjack were significantly larger than males (Harris 2004; Harris et al. 2007). For males, the size at which 50% of individuals were mature was 25 inches fork length (FL) and

for females was 29 inches FL. They estimated a spawning season of approximately 73 days off south Florida, with a spawning period of 5 days, and that an individual female could spawn as frequently as 14 times during the season. Female fecundity increased with size but was essentially constant throughout the spawning season. Greater amberjack are extremely fecund, releasing 18 to 59 million eggs per female in a single spawning season (Harris et al. 2007). Murie and Parkyn (2008) documented that, for Gulf females, 50% of individuals were mature at 35 inches FL (900 mm FL), larger than what Harris et al. (2007) documented off south Florida.

Harris et al. (2007) suggested that there are known spawning aggregations of greater amberjack targeted by fishers in the South Atlantic, however, no direct evidence of this was presented. Observations by SCUBA divers in Belize documented greater amberjack in pair courtship when they were in a school of approximately 120 fish (Graham and Castellanos 2005). However, no aggregation or indication of spawning aggregations was discussed by the Murie and Parkyn (2008) Gulf study or in any other earlier Gulf studies.

After spawning, eggs and larvae of greater amberjack are pelagic. Smaller juvenile greater amberjack less than 1 inch standard length (20 mm) were found associated with pelagic *Sargassum* mats (Aprieto 1974; Bortone et al. 1977; Wells and Rooker 2004). Juveniles then shift to demersal habitats (5 - 6 months), where they congregate around reefs, rocky outcrops, and wrecks (GMFMC 2004). Greater amberjack are only seasonally abundant in certain parts of their range, thus they likely utilize a variety of habitats and/or areas each year throughout their range. Greater amberjack have been documented on artificial structures as well as natural reefs (Ingram and Patterson 2001). Greater amberjack in the Gulf have been reported to live as long as 15 years and commonly reach sizes greater than 40 inches FL (1,016 mm FL) (Manooch and Potts 1997).

Status of the Greater Amberjack Stock

See Chapter 1.1 Background.

Protected Species

The Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) provide special protections to some species that occur in the Gulf. A very brief summary of these two laws and more information is available on NMFS Office of Protected Resources website (http://www.nmfs.noaa.gov/pr/laws/). All 22 marine mammals in the Gulf are protected under the MMPA. Two marine mammals (sperm whales and manatees) are also protected under the ESA. Other species protected under the ESA include sea turtle species (Kemp's ridley, loggerhead (Northwest Atlantic Ocean distinct population segment distinct population segment [DPS]), green (South Atlantic and North Atlantic DPSs), leatherback, and hawksbill), three fish species (Gulf sturgeon, smalltooth sawfish, and Nassau grouper), and six coral species (elkhorn, staghorn, lobed star, mountainous star, pillar, and boulder star). Critical habitat designated under the ESA for smalltooth sawfish, Gulf sturgeon, and the Northwest Atlantic Ocean DPS of loggerhead sea turtles also occur in the Gulf, though only loggerhead critical habitat occurs in federal waters.

The most recent biological opinion (opinion) on the Reef Fish Fishery Management Plan (FMP) was completed on September 30, 2011 (NMFS 2011). The opinion determined the continued authorization of the Gulf reef fish fishery managed under the Reef Fish FMP is not likely to affect ESA-listed marine mammals or corals, and is not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback), or smalltooth sawfish. An incidental take statement was provided. 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 are not likely to adversely affect critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle DPS or four species of corals (*Mycetophyllia ferox*, *Orbicella annularis*, *O. faveolata*, and *O. franksi*).

On April 6, 2016, NMFS and the U.S. Fish and Wildlife Service published a final rule (81 FR 20057) removing the range-wide and breeding population ESA-listings of the green sea turtle and listing eight DPSs as threatened and three DPSs as endangered, effective May 6, 2016. Two of the green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, occur in the Gulf and are listed as threatened. In addition, on June 29, 2016, NMFS published a final rule (81 FR 42268) listing Nassau grouper as threatened under the ESA. NMFS has reinitiated consultation on the Reef Fish FMP to address these listings and in a memorandum dated September 29, 2016, NMFS determined that allowing fishing under the Reef Fish FMP to continue during the reinitiation period is not likely to jeopardize the continued existence of the North Atlantic and South Atlantic DPSs of green sea turtles or Nassau grouper. 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)..

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 to the running average over the past five years of 5,543 square miles of the Gulf (see http://www.gulfhypoxia.net/). 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).

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] http://www.ipcc.ch/). 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; alter 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 Portal[1] predicts the average sea surface temperature in the Gulf will increase by 1.2-1.4ºC for 2006-2055 compared to the average over the years 1956-2005. 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 has been affected.

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 (http://www.ipcc.ch/) has indicated greenhouse gas emissions are one of the most important drivers of recent changes in climate. Wilson et al. (2014) 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 3.3.1, 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 (1.43% and 0.59%, respectively).

[1] source:

https://www.esrl.noaa.gov/psd/ipcc/

Table 3.3.1. Total Gulf greenhouse gas emissions estimates (tons per year) 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	Greenhouse Gas CO_2	CH_4	N_2O	Total CO_{2e}**
Oil platform	11,882,029	271,355	167	17,632,106
Non-platform	22,703,695	2,029	2,698	23,582,684
Total	34,585,724	273,384	2,865	41,214,790
Commercial fishing	585,204	2	17	590,516
Percent commercial fishing	1.69	> 0.01	0.59	1.43

*Compiled from Tables 7.9 and 7.10 in Wilson et al. (2014).
**The CO_2 equivalent (CO_2e) emission estimates represent the number of tons of CO_2 emissions with the same global warming potential as one ton of another greenhouse gas (e.g., CH_4 and N_2O). Conversion factors to CO_{2e} are 21 for CH_4 and 310 for N_2O.

Deepwater Horizon MC252 Oil Spill

General Impacts on Fishery Resources

The presence of polyaromatic hydrocarbons (PAH) in marine environments, which are highly toxic chemicals that tend to persist in the environment for long periods of time, 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 (TL)) 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 3.3.1). 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.[2]

[2] Source: http://sero.nmfs.noaa.gov/deepwater_horizon/documents/pdfs/fact_sheets/oil_characteristics.pdf

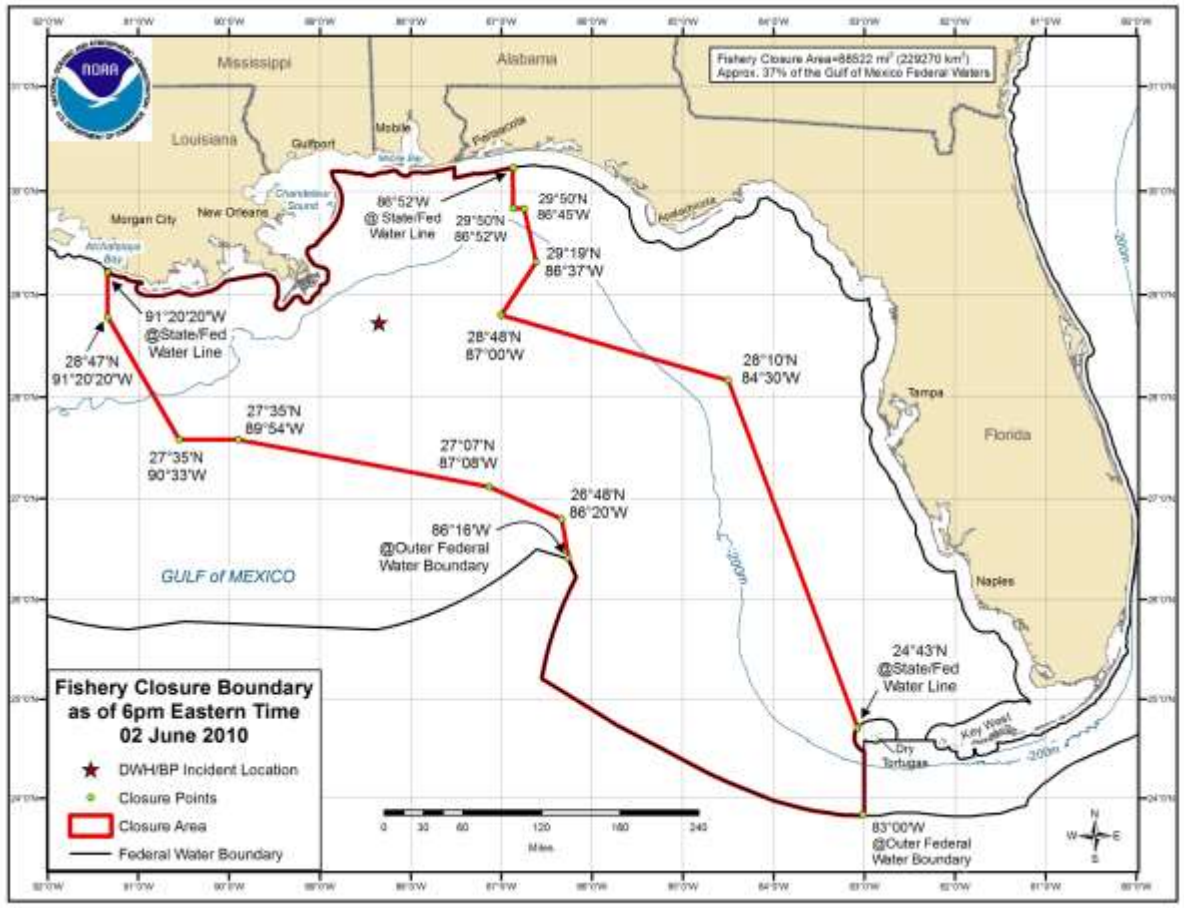

Figure 3.3.1. Fishery closure at the height of the Deepwater Horizon MC252 oil spill

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). For additional information on the Deepwater Horizon MC252 oil spill and associated closures, see: http://sero.nmfs.noaa.gov/deepwater_horizon_oil_spill.htm.

3.4 Description of the Economic Environment

3.4.1 Commercial Sector

Vessel Activity

Tables 3.4.1.1 and 3.4.1.2 contain information on vessel performance for commercial vessels that harvested greater amberjack in the Gulf in 2011-2015. The tables contain vessel counts from the NMFS Southeast Fisheries Science Center (SEFSC) logbook (logbook) data (vessel count, trips, and landings). Dockside values were generated using landings information from logbook data and price information from the NMFS SEFSC Accumulated Landings System (ALS) data. The data in Tables 3.4.1.1-3.4.1.2 cover all vessels that harvested greater amberjack anywhere in the Gulf, regardless of trip length or species target intent.

Landings shown in Tables 3.4.1.1-3.4.1.2 are based on logbook information for landings and NMFS ALS for prices (SEFSC-SSRG Economic Panel Data). Thus, these landings would not exactly match with greater amberjack landings shown in Table 1.1.4, which are based on SEFSC ACL databases. In addition, the landings are presented in gutted weight rather than whole weight. Landings for all species in the SEFSC-SSRG Economic Panel Data are expressed in gutted weight to provide one unit for all species, because data summarizations as done in Tables 3.4.1.1-3.4.1.2 involve a multitude of species. Federally permitted vessels required to submit logbooks generally report their harvest of most species, regardless of whether the fish were caught in state or federal waters.

On average, 185 vessels per year landed greater amberjack in the Gulf (Table 3.4.1.1). These vessels, combined, averaged 522 trips per year in the Gulf on which greater amberjack was landed and 2,935 other trips (Table 3.4.1.1). The average annual total dockside revenue (2015 dollars) was approximately $0.54 million from greater amberjack, approximately $4.44 million from other species co-harvested with greater amberjack (on the same trips), and approximately $26.75 million from other trips by these vessels on trips in the Gulf on which no greater amberjack were harvested or occurred in the South Atlantic (Table 3.3.1.2). Total average annual revenue from all species harvested by vessels harvesting greater amberjack in the Gulf was approximately $31.74 million, or approximately $171,971 per vessel (Table 3.3.1.2).

Table 3.4.1.1. Summary of vessel counts, trips, and logbook landings (pounds gutted weight (lbs gw)) for vessels landing at least one pound of greater amberjack, 2011-2015.

Year	Number of Vessels	Number of Gulf Trips that Caught Greater Amberjack	Greater Amberjack Landings (lbs gw)	"Other Species" Landings Jointly Caught with Greater Amberjack (lbs gw)	Number of Other Trips*	Landings on Other Trips (lbs gw)
2011	191	525	445,027	1,155,980	3,029	1,155,980
2012	142	314	270,223	692,299	2,458	692,299
2013	184	501	359,316	1,160,832	2,707	1,160,832
2014	221	718	427,543	1,794,266	3,460	1,794,266
2015	185	554	400,548	1,364,588	3,021	1,364,588
Average	185	522	380,531	1,233,593	2,935	1,233,593

Source: NMFS SEFSC Economic Query System, March 7, 2017.
*Includes Gulf trips on which greater amberjack were not harvested as well as trips in the South Atlantic regardless of what species were harvested, including greater amberjack

Table 3.4.1.2. Summary of vessel counts and revenue (2015 dollars) for vessels landing at least one pound of greater amberjack, 2011-2015.

Year	Number of Vessels	Dockside Revenue from Gulf Greater Amberjack	Dockside Revenue from "Other Species" Jointly Caught with Greater Amberjack	Dockside Revenue on Other Trips	Total Dockside Revenue	Average Total Dockside Revenue per Vessel
2011	191	$574,642	$3,691,100	$21,421,501	$25,687,243	$134,488
2012	142	$349,631	$2,201,463	$18,560,180	$21,111,275	$148,671
2013	184	$539,020	$4,283,046	$26,481,149	$31,303,214	$170,126
2014	221	$645,813	$6,693,805	$33,598,026	$40,937,644	$185,238
2015	185	$607,976	$5,368,653	$33,713,214	$39,689,843	$214,540
Average	185	$543,416	$4,447,614	$26,754,814	$31,745,844	$171,971

Source: NMFS SEFSC Economic Query System, March 7, 2017.

Ex-vessel Prices

The dockside or ex-vessel price is the price the vessel receives at the first sale of harvest. Over the period 2011-2015, the average annual ex-vessel price per pound for greater amberjack harvested in the Gulf was $1.43 (2015 dollars), and ranged from $1.29 in 2011 to $1.52 in 2015.

Commercial Sector Business Activity

Estimates of the business activity (economic impacts) in the U.S. associated with the Gulf greater amberjack commercial harvests were derived using the model developed for and applied in NMFS (2015) and are provided in Table 3.3.1.3. Business activity for the commercial sector is characterized in the form of full-time equivalent (FTE) jobs, output (sales) impacts (gross business sales), income impacts (wages, salaries, and self-employed income), and value added impacts (difference between the sales price of a good and the cost of the goods and services needed to produce it). Income impacts should not be added to output (sales) impacts because this would result in double counting. The estimates of economic activity include the direct effects (effects in the sector where an expenditure is actually made), indirect effects (effects in sectors providing goods and services to directly affected sectors), and induced effects (effects induced by the personal consumption expenditures of employees in the direct and indirectly affected sectors).

Table 3.4.1.3. Average annual business activity (thousand 2015 dollars) associated with the harvests of vessels that harvested greater amberjack in the Gulf, 2011-2015.

Species	Average Annual Dockside Revenue	Jobs	Output (Sales) Impacts	Income Impacts	Value Added Impacts
Greater Amberjack	$543	74	$5,389	$1,979	$2,796
All species*	$31,746	4,303	$314,818	$115,612	$163,346

*Includes dockside revenues and economic activity associated with the average annual harvest of all species, including greater amberjack, harvested by vessels that harvested greater amberjack in the Gulf.
Source: Revenue data from NMFS SEFSC Logbook and ALS data, economic impact results calculated by NMFS SERO using the model developed for NMFS (personal communication, M. Larkin, 2016).

In addition to the business activities generated by commercial vessel landings of greater amberjack, business activities associated with commercial vessel landings of all other species landed by commercial vessels are also presented in the tables above. Vessels that harvested greater amberjack also harvested other species on trips where greater amberjack were harvested, and some took other trips in the Gulf on which no greater amberjack were harvested, as well as trips in the South Atlantic. All revenues from all species harvested on all of these trips contributed towards making these vessels economically viable and contribute to the economic activity associated with these vessels.

Dealers

Commercial vessels landing greater amberjack can only sell their catch to seafood dealers with valid Gulf and South Atlantic Dealer (GSAD) permit. On March 3, 2017, there were 412 dealers with a valid GSAD permit. There are no income or sales requirements to acquire a GSAD permit. As a result, the total number of dealers can vary over the course of the year and from year to year.

Imports

Information on the imports of reef fish species, either fresh or frozen, are available at: http://www.st.nmfs.noaa.gov/st1/trade/cumulative_data/TradeDataProduct.html. Information on the imports of individual snapper or grouper species, including greater amberjack, is not available. In 2016, imports of all snapper and grouper species (fresh and frozen) were approximately 57.20 million pounds valued at approximately $176.86 million (2016 dollars). These amounts are contrasted with the harvest of all snapper in the Gulf in 2016 of approximately 14.59 mp valued at approximately $54.94 million (2016 dollars; data available at: http://www.st.nmfs.noaa.gov/commercial-fisheries/publications/index). Although the levels of domestic production and imports are not totally comparable for several reasons, including considerations of different product form such as fresh versus frozen, and possible product mislabeling, the difference in the magnitude of imports relative to the amount of domestic harvest is indicative of the dominance of imports in the domestic market. Final comparable data for more recent years are not currently available.

3.4.2 Recreational Sector

Angler Effort

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

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

Other measures of effort are possible, such as directed trips (the number of individual angler trips that either targeted or caught a particular species). Estimates of the number of greater amberjack target trips and catch trips for the shore, charter, and private/rental boat modes in the Gulf for 2011-2016 are provided in Table 3.3.2.1. Data for 2016 are preliminary. None of the states

recorded greater amberjack target trips for the shore mode. Over the period examined, greater amberjack were most commonly targeted by private/rental anglers, and average greater amberjack target effort totaled approximately 63,000 trips per year across all modes (Table 3.3.2.1). As shown in Table 3.3.2.1, considerably more trips caught greater amberjack, approximately 155,000 trips from all modes, than targeted greater amberjack, but the private/rental mode remains the dominant mode. Florida is the dominant state in both target and catch effort for each mode.

Table 3.4.2.1. Average number of greater amberjack recreational target and catch trips, by mode, by state, 2011-2016*.

	Shore Mode	Charter Mode	Private/Rental Mode	All Modes
Target Trips				
Alabama	nr	1,787	9,626	11,414
Florida	nr	9,196	36,364	45,560
Mississippi	nr	756	2,861	3,617
Louisiana	nr	nr	3,255	3,255
Total	nr	11,739	52,106	63,845
Catch Trips				
Alabama	2,964	8,008	12,243	23,215
Florida	1,177	45,961	74,931	122,069
Mississippi	nr	3,278	5,072	8,350
Louisiana	nr	nr	2,043	2,043
Total	4,141	57,248	94,288	155,677

*"nr" = none recorded. Averages based on positive entries; "nr" entries are not assumed equivalent to "0" trips; 2016 data are preliminary; Texas is not covered in the MRFSS/MRIP, so no target or catch trips are available for the state. Louisiana from 2014 to present are collected through LA Creel and not available in the MRIP database. Source: MRIP database, NMFS, SERO.

Similar analysis of recreational effort is not possible for the headboat mode because headboat data are not collected at the angler level. Estimates of effort by the headboat mode are provided in terms of angler days, or the number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. The stationary "fishing for demersal (bottom-dwelling) species" nature of headboat fishing, as opposed to trolling, suggests that most, if not all, headboat trips, and hence, angler days, are demersal or reef fish trips by intent. Estimates of headboat effort (angler days) are provided in Table 3.3.2.3. Headboat data are collected by the NMFS SRHS.

Table 3.4.2.2. Headboat angler days and percent distribution, by state, 2011-2015.

	Angler Days				Percent Distribution			
	FLW	NWFL-AL*	MS-LA**	TX	FLW	FL-AL	MS-LA	TX
2011	79,722	77,303	3,657	47,284	38.3%	37.2%	1.8%	22.7%
2012	84,205	77,770	3,680	51,776	38.7%	35.8%	1.7%	23.8%
2013	94,752	80,048	3,406	55,749	40.5%	34.2%	1.5%	23.8%
2014	102,841	88,524	3,257	51,231	41.8%	36.0%	1.3%	20.8%
2015	107,910	86,473	3,587	55,135	42.6%	34.2%	1.4%	21.8%
Average	93,886	82,024	3,517	52,235	40.5%	35.4%	1.5%	22.5%

Source: NMFS SRHS.

*Beginning in 2013, headboat data were reported separately for NW Florida and Alabama, but has been combined here for consistency with previous years. **Headboats from MS and LA are combined for confidentiality purposes.

Permits

The for-hire sector is comprised of charter vessels and headboats (party boats). Although charter vessels tend to be smaller, on average, than headboats, the key distinction between the two types of operations is how the fee is determined. On a charter boat trip, the fee charged is for the entire vessel, regardless of how many passengers are carried, whereas the fee charged for a headboat trip is paid per individual angler.

A federal reef fish charter/headboat (for-hire) vessel permit is required for fishing in federal waters for Gulf reef fish. On March 3, 2017, there were 1,179 vessels with a valid (non-expired) or renewable Gulf for-hire reef fish permit (including historical captain permits). A renewable permit is an expired limited access permit that may not be actively fished, but is renewable for up to one year after expiration. The Gulf reef fish for-hire permits are limited access permits. Most for-hire vessels possess more than one for-hire permit.

Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel, and vessels may operate in both capacities. However, if a vessel meets certain selection criteria used by the SRHS and is selected to report by the Science Research Director (SRD) of the SEFSC, it is determined to operate primarily as a headboat and is required to submit harvest and effort information to the SRHS. As of February 2017, 73 Gulf headboats were registered in the SRHS (K. Fitzpatrick, NMFS SEFSC, pers. comm.).

Information on Gulf charter vessel and headboat operating characteristics is included in Savolainen et al. (2012) and is incorporated herein by reference. The average charter vessel operation took 46 full-day (9 hours) and 55 half-day (5 hours) trips per year, carried 4.8 and 4.6 passengers per trip type, respectively, targeted reef fish and pelagic species on 64% and 19% of all trips, respectively, and took 68% of all trips in the EEZ. The average headboat operation took 83 full-day (10 hours) and 37 half-day (6 hours) trips per year, carried 13.1 and 14.6 passengers

per trip type, respectively, targeted reef fish and pelagic species on 84% and 6% of all trips, respectively, and took 81% of all trips in the EEZ.

There are no specific federal permitting requirements for recreational anglers to fish for or harvest reef fish. Instead, anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. For the for-hire sector, customers are authorized to fish under the charter or headboat vessel license and are not required to hold their own fishing licenses. As a result, it is not possible to identify with available data how many individual anglers would be expected to be affected by this amendment.

Economic Value

Economic value can be measured in the form of consumer surplus (CS) per additional fish kept on a trip for anglers (the amount of money that 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 greater amberjack is unknown but a proxy may be used to approximate the CS per fish. Haab et al. (2012) estimated a CS for an additional snapper caught and kept of $12.09 (2015 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.).

Business Activity

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

Estimates of the business activity (economic impacts) associated with recreational angling for greater amberjack were derived using average impact coefficients for recreational angling for all species, as derived from an add-on survey to the MRFSS to collect economic expenditure information, as described and utilized in NMFS (2015). Estimates of the average expenditures by recreational anglers are also provided in NMFS (2015) and are incorporated herein by reference.

Recreational fishing generates business activity (economic impacts). Business activity for the recreational sector is characterized in the form of FTE jobs, output (sales) impacts (gross

business sales), income impacts, and value-added impacts (difference between the value of goods and the cost of materials or supplies). Estimates of the average greater amberjack target effort (2011-2016) and associated business activity (2015 dollars) are provided in Table 3.3.2.3.

The average annual target effort for greater amberjack over the period 2011-2016 supported an estimated 75 jobs in Florida and generated approximately $8.1 million in output (sales) impacts, $5.0 million in value added impacts, and $3.3 million in income impacts. The corresponding numbers for the other states are: 17 jobs, $1.5 million in output impacts, $0.8 in value added impacts, and $0.57 million in income impacts in Alabama; 1 job, $0.1 million in output impacts, $0.06 million in value added impacts, and $0.03 million in income impacts in Mississippi; 6 jobs, $0.6 million in output impacts, $0.3 million in value added impacts, and $0.2 million in income impacts in Louisiana.

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

Table 3.4.2.3. Summary of greater amberjack target trips (2011-2016 average) and associated business activity (thousand 2015 dollars). Output, value added, and income impacts are not additive.

	Impacts			
	Florida	**Alabama**	**Mississippi**	**Louisiana**
	Private/Rental Mode	**Private/Rental Mode**	**Private/Rental Mode**	**Private/Rental Mode**
Target Trips	36,364	9,626	3,255	2,861
Output Impact	$1,838	$475	$108	$205
Value Added Impact	$1,163	$274	$60	$118
Income Impact	$704	$166	$35	$64
Jobs	17	5	1	2
	Charter Mode	**Charter Mode**	**Charter Mode**	**Charter Mode**
Target Trips	9,196	1,787		756
Output Impact	$6,309	$1,033		$411
Value Added Impact	$3,837	$559		$251
Income Impact	$2,670	$404		$191
Jobs	58	12		4
	All Modes	**All Modes**	**All Modes**	**All Modes**
Target Trips	45,560	11,413	3,255	3,617
Output Impact	$8,147	$1,508	$108	$617
Value Added Impact	$5,000	$833	$60	$369
Income Impact	$3,374	$570	$35	$255
Jobs	75	17	1	6

Note: There are no recorded greater amberjack target trips for the shore mode, so there are no consequent economic activities. Source: Effort data from the MRIP, economic impact results calculated by 2016 NMFS SERO model.

3.5 Description of the Social Environment

This framework action affects commercial and recreational management of greater amberjack in the Gulf. Commercial and recreational landings by state are included to provide information on the geographic distribution of fishing involvement. Descriptions of the top communities involved in commercial greater amberjack are included, along with the top recreational fishing communities, based on recreational engagement. Community level data are presented in order to meet the requirements of National Standard 8 of the Magnuson-Stevens 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.

3.5.1 Landings by State

The majority of greater amberjack landings are from the recreational sector in the Gulf (range of 59.6% to 81.2% from 2002-2016, Table 1.1.4). Within the recreational sector, the greatest proportion of landings are from private anglers (range of 31.9% to 71.8% from 2002 to 2016, Table 1.1.4) and charter vessels (range of 24.1% to 61.5%), followed by headboats (range of 1% to 8%).

Commercial

The greatest proportion of commercial greater amberjack landings are from waters adjacent to Florida (average of 49.6% from 2010-2016), followed by Louisiana and Texas, then Alabama and Mississippi (Table 3.5.1.1).

Table 3.5.1.1. Percentage of total commercial greater amberjack landings by state for 2010-2015.

Year	FL	AL/MS	LA/TX
2010	47.3%	3.0%	49.7%
2011	51.5%	1.8%	46.7%
2012	55.9%	5.4%	38.7%
2013	54.2%	5.6%	40.2%
2014	47.4%	17.2%	35.4%
2015	45.1%	19.4%	35.5%
2016	45.9%	19.9%	34.2%

Source: SEFSC Commercial ACL Dataset, 5/2/17.

Recreational

The majority of recreational greater amberjack is harvested from waters adjacent to Florida and Alabama (average of 88.8% from 2010-2016), followed by Louisiana and Mississippi, and Texas (Table 3.5.1.2). Recreational landings for Florida and Alabama, and Louisiana and Mississippi, are aggregated together because of the manner in which headboat landings are reported.

Table 3.5.1.2. Percentage of total recreational greater amberjack landings by state for 2010-2016.

Year	AL/FL	LA/MS	TX
2010	91.6%	6.6%	1.8%
2011	96.2%	1.8%	2.0%
2012	84.6%	13.1%	2.3%
2013	85.8%	12.3%	1.9%
2014	91.0%	6.2%	2.8%
2015	88.5%	9.4%	2.1%
2016	83.8%	15.5%	0.7%

Source: SEFSC Recreational ACL Dataset, 6/7/17.

3.5.2 Fishing Communities

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

In addition to examining the RQs to understand how communities are engaged and reliant on fishing, indices were created using secondary data from permit and landings information for the commercial sector (Jepson and Colburn 2013, Jacob et al. 2013). Fishing engagement is primarily the absolute numbers of permits, landings, and value for all species. For commercial fishing, the analysis used the number of vessels designated commercial by homeport and owner address, value of landings, and total number of commercial permits for each community for all species. Fishing reliance includes the same variables as fishing engagement, divided by population, to give an indication of the per capita influence of this activity.

Using a principal component and single solution factor analysis, each community receives a factor score for each index to compare to other communities. Factor scores of both engagement and reliance were plotted for the communities with the highest RQs. Two thresholds of one and one-half standard deviation above the mean are plotted to help determine a threshold for significance. The factor scores are standardized; therefore, a score above a value of 1 is also above one standard deviation. A score above one-half standard deviation is considered engaged or reliant, with anything above one standard deviation to be very engaged or reliant.
The reliance index uses factor scores that are normalized. The factor score is similar to a z-score, in that the mean is always zero. Positive scores are above the mean, and negative scores are below the mean. Comparisons between scores are relative. However, like a z-score, the factor score puts the community on a point in the distribution. Objectively, that community will have a score related to the percent of communities with similar attributes. For example, a score of 2.0 means the community is two standard deviations above the mean and is among the 2.27% most vulnerable places in the study (normal distribution curve). Reliance score comparisons between communities are relative. However, if the community scores greater than two standard deviations above the mean, this indicates that the community is dependent on fishing.
Examining the component variables on the reliance index, and how they are weighted by factor score, provides a measurement of commercial reliance. The reliance index provides a way to gauge change over time in these communities, and also provides a comparison of one community with another.

Landings for the recreational sector are not available by species at the community level; therefore, it is not possible, with the available information, to identify communities as dependent on recreational fishing for greater amberjack. 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. Figure 3.5.2.3 identifies the top communities that are engaged and reliant upon recreational fishing in general.

Commercial Fishing Communities

The top greater amberjack communities are located in Florida, Alabama, and Louisiana (Figure 3.5.2.1). About 41% of greater amberjack is landed in the top three communities (Key Largo, Florida; Bayou La Batre, Alabama; and Destin, Florida), representing about 40% of the Gulf-wide ex-vessel value for the species (Figure 3.5.2.1). Several Florida Keys communities (Key Largo, Islamorada, and Sugarloaf Key) are included in the top communities.

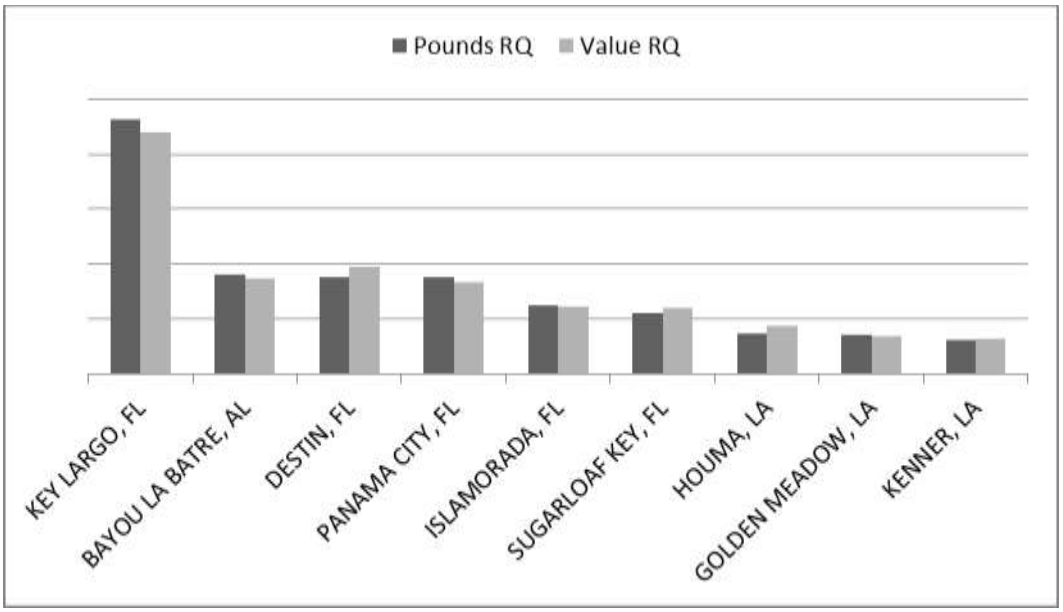

Figure 3.5.2.1. Top ten Gulf communities ranked by pounds and value RQ of greater amberjack. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2014.

The details of how these indices are generated are explained at the beginning of the Fishing Communities section. The primary communities that demonstrate high levels of commercial engagement and reliance include Bayou La Batre, Alabama; Destin and Islamorada, Florida; and Golden Meadow, Louisiana (Figure 3.5.2.2).

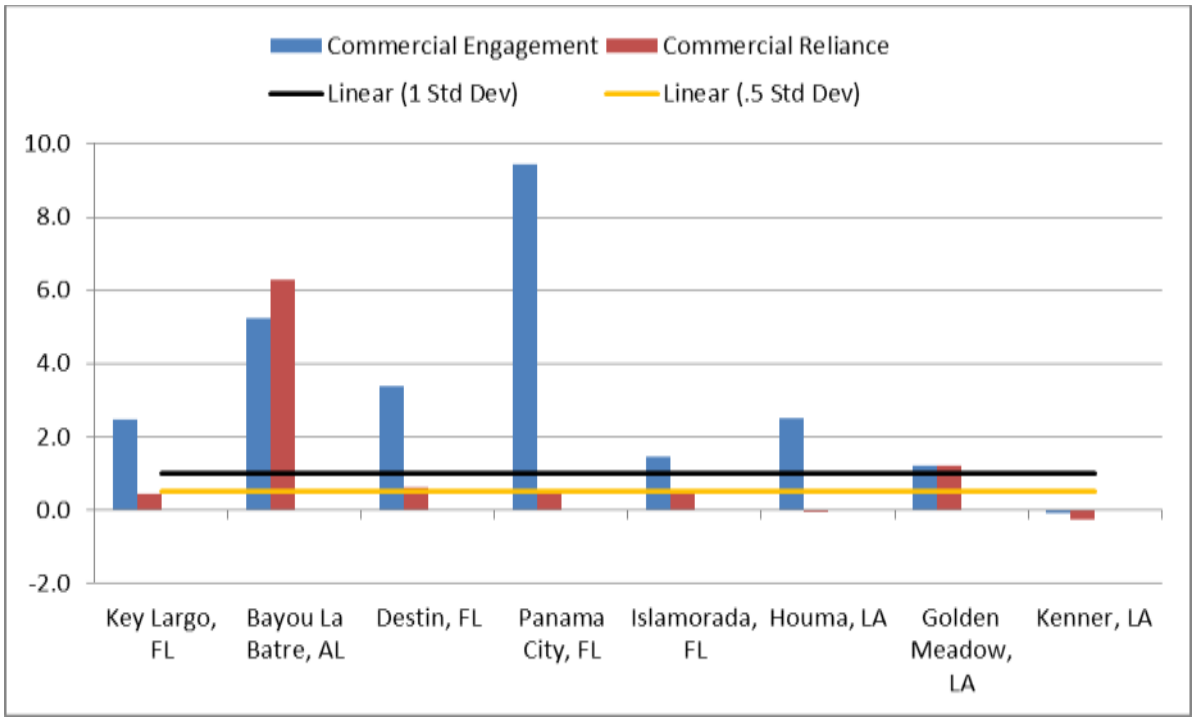

Figure 3.5.2.2. Top Gulf greater amberjack communities' commercial engagement and reliance.
Source: SERO, Social indicators database (2012).

Recreational Fishing Communities

The details of how these indices are generated are explained at the beginning of the Fishing Communities section. Figure 3.5.2.3 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 greater amberjack. 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.

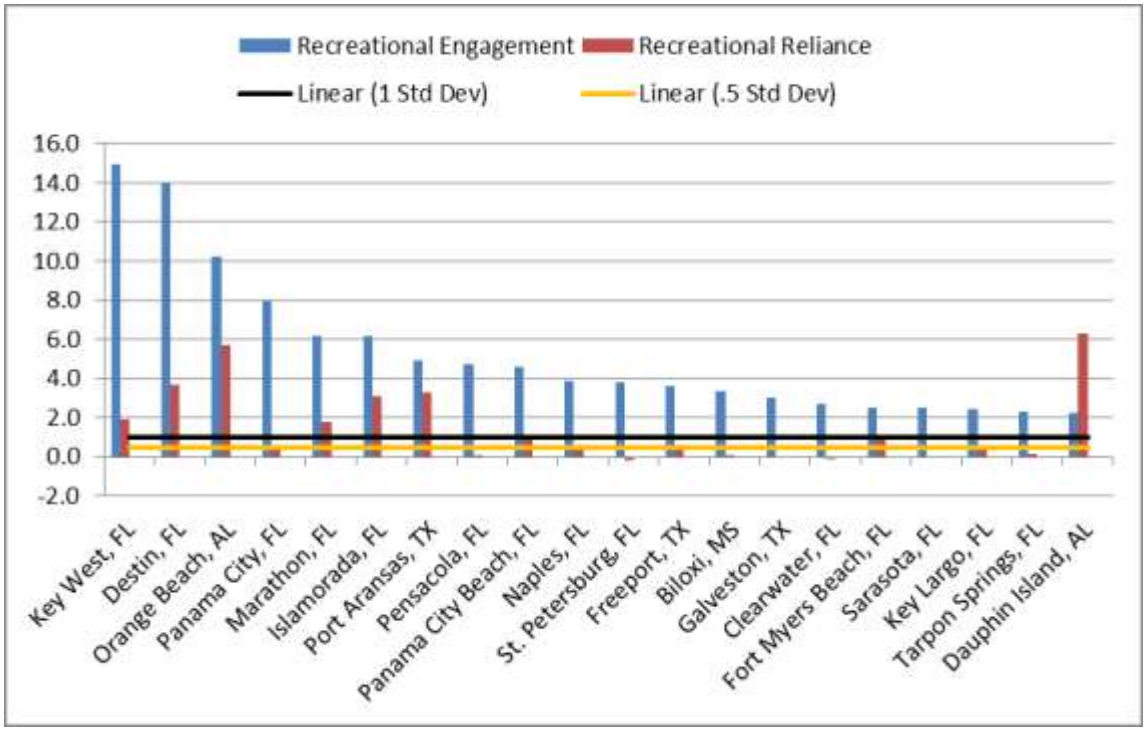

Figure 3.5.2.3. Top 20 recreational fishing communities' engagement and reliance.
Source: SERO, Social indicators database (2012).

3.5.3 Environmental Justice

Executive Order (E.O.) 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 E.O. 12898 is to consider "the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" This executive order is generally referred to as environmental justice (EJ).

Commercial and recreational fishermen and associated industries could be impacted by the proposed actions. However, information on the race and income status for groups at the different participation levels is not available. Although information is available concerning communities overall status with regard to minorities and poverty (e.g., census data), such information is not available specific to fishermen and those involved in the industries and activities, themselves. To help assess whether any environmental justice concerns arise from the actions in this amendment, a suite of indices were created to examine the social vulnerability of coastal communities. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as

being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and households with children under the age of five, disruptions such as higher separation rates, higher crime rates, and unemployment, all are signs of populations experiencing vulnerabilities. Again, for those communities that exceed the threshold, vulnerabilities to sudden changes or social disruption that might accrue from regulatory change would be expected.

Figure 3.5.3.1 provides the social vulnerability of the top commercial and recreational communities. One community exceeds the threshold of one standard deviation above the mean for all three indices (Bayou La Batre, Alabama). Several other communities exceed the threshold of one standard deviation above the mean for any of the indices (Biloxi, Mississippi; Dauphin Island, Alabama; Freeport, Texas; Galveston, Texas; and Golden Meadow, Louisiana). Several communities exceed the threshold of one-half standard deviation above the mean for three of the indices (Bayou La Batre, Alabama; Freeport, Texas; and Galveston, Texas). These communities would be the most likely to exhibit vulnerabilities to social or economic disruption due to regulatory change.

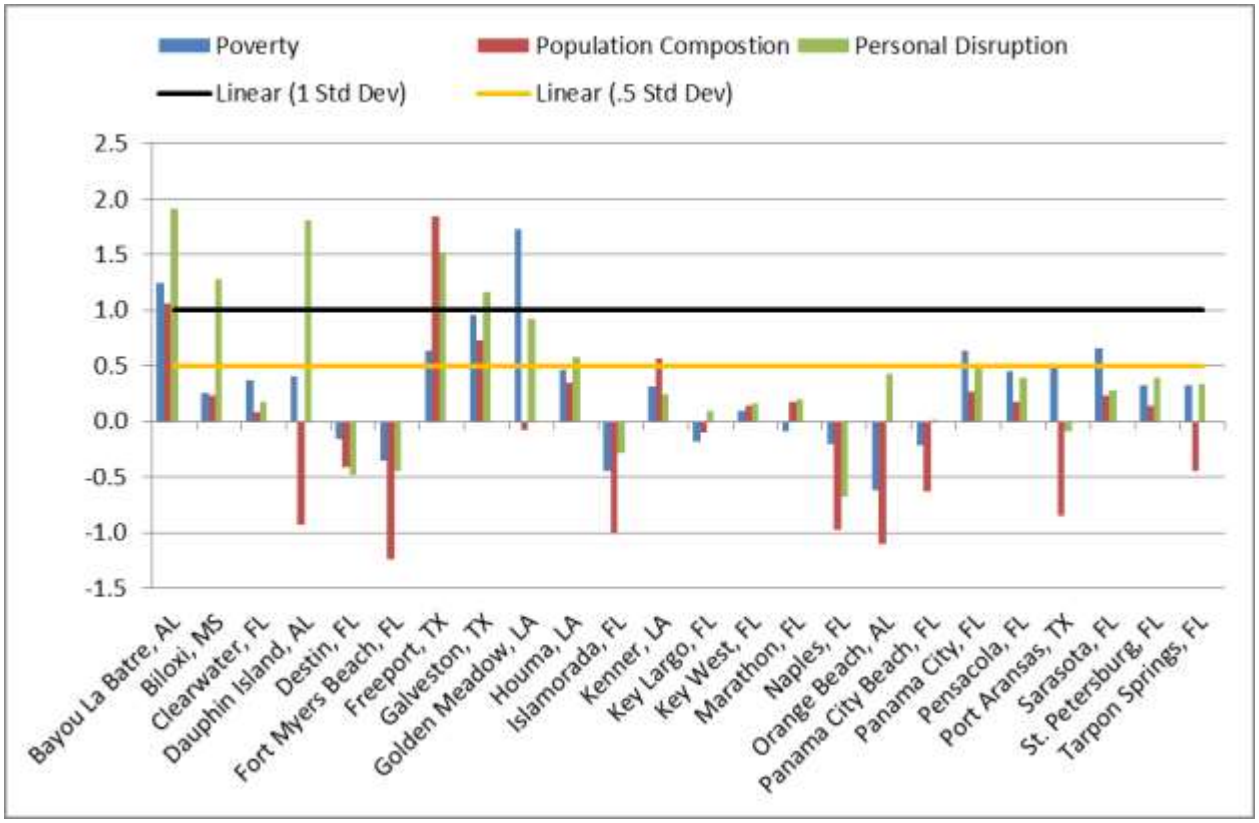

Figure 3.5.3.1. Social vulnerability indices for top commercial and recreational fishing communities.
Source: SERO Social indicators database (2012).

People in these communities may be affected by fishing regulations in two ways: participation and employment. Although these communities may have the greatest potential for EJ concerns, no data are available on the race and income status for those involved in the local fishing industry (employment), or for their dependence on greater amberjack specifically (participation). However, the implementation of the proposed actions of this amendment would not discriminate against any group based on their race, ethnicity, or income status because the proposed actions would be applied to all participants in the fishery. Further, there is no known subsistence fishing for greater amberjack. Thus, the actions of this amendment are not expected to result in adverse or disproportionate environmental or public health impacts to EJ populations. Although no EJ issues have been identified, the absence of potential EJ concerns cannot be assumed.

3.6 Description of the Administrative Environment

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

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

The Council is responsible for fishery resources in federal waters of the Gulf. These waters extend to 200 nautical miles offshore from the seaward boundaries of Alabama, Florida, Louisiana, Mississippi, and Texas, as those boundaries have been defined by law. The length of the Gulf coastline is approximately 1,631 miles. Florida has the longest coastline extending 770 miles along its Gulf coast, followed by Louisiana (397 miles), Texas (361 miles), Alabama (53 miles), and Mississippi (44 miles).

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

rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

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

3.6.2 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 exercise legislative and regulatory authority over their states' natural resources through discrete administrative units. Although each agency is the primary administrative body with respect to the states' natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources. A more detailed description of each state's primary regulatory agency for marine resources is provided on their respective web pages (Table 3.6.2.1).

Table 3.6.2.1. 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/

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CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action 1 - Modifications to the Greater Amberjack Annual Catch Limits (ACL) and Annual Catch Targets (ACT)

4.1.1 Direct and Indirect Effects on the Physical Environment

Impacts of these alternatives on the physical environment depend on the resulting reduction in the level of fishing effort by the commercial and recreational sectors. The commercial sector is currently allocated 27% of the acceptable biological catch (ABC) and the recreational sector is currently allocated 73% of the ABC. Using commercial greater amberjack landings history from 1992 - 2016, longlines landed 7% of the greater amberjack and vertical lines (i.e., electric reel, bandit rig, hook and line, and trolling) landed 75% of the greater amberjack, while 18% of the landings were from other gear types (diving, nets) (SEFSC Commercial ACL Data Set July 2017). Landings by trolling and diving with a spear were low and infrequent compared to hand and electric vertical lines in the commercial sector. The recreational sector (headboat, charter, and private modes) primarily uses hand lines and sometimes electric reels to fish for reef fish, including greater amberjack. Recreational fishers also harvest greater amberjack with spear and powerhead gear. When recreational fishers are targeting greater amberjack, they often use large live baits and the attached weights and hooks may or may not touch the bottom, depending on the structure type and fisher experience level.

Longlines

Longline gear is deployed over hard bottom habitats using weights to keep the gear in direct contact with the bottom. The potential for this gear to adversely impact the bottom depends on the type of habitat it is set on, the presence or absence of currents and the behavior of fish after being hooked. In addition, upon retrieval, this gear can abrade, snag, and dislodge smaller rocks, corals, and sessile invertebrates (Hamilton 2000; Barnette 2001). Direct underwater observations of longline gear in the Pacific halibut fishery by High (1998) noted that the gear could sweep across the bottom. A study that directly observed deployed longline gear (Atlantic tilefish fishery) found there was no evidence that the gear shifted significantly, even when set in currents. Lack of gear shifting, even in strong currents, was attributed to setting anchors at either end of the longline to prevent movement (Grimes et al. 1982). Based on the direct observations, it is logical to assume that bottom longline gear would have a minor impact on sandy or muddy habitat areas. However, due to the vertical relief that hardbottom and coral reef habitats provide, entanglement of bottom longline gear is possible, resulting in potential negative impacts to habitat, including Essential Fish Habitat (EFH) (Barnette 2001).

Vertical lines

Concentrations of many managed reef fish species are higher on hard bottom areas than on sand or mud bottoms, thus, vertical line gear fishing generally occurs over hard bottom areas (GMFMC 2004). Vertical lines include multi-hook lines known as bandit gear, handlines, and

rod-and-reels. Vertical-line gear is less likely to contact the bottom than longlines, but still has the potential to snag and entangle bottom structures and cause attached organisms, such as soft corals and sponges, to tear off or be abraded (Barnette 2001). In using bandit gear, a weighted line is lowered to the bottom, and then the lead is raised slightly off the bottom (Siebenaler and Brady 1952). The gear is in direct contact with the bottom for only a short period of time. Barnette (2001) suggests that physical impacts may include entanglement and minor degradation of benthic species from line abrasion and the use of weights (sinkers).

Anchor damage is also associated with vertical-line fishing vessels, particularly by the recreational sector where fishermen may repeatedly visit well marked or known fishing locations. Hamilton (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 and EFH where fishing for greater amberjack and other reef fish occurs. The for-hire sector and commercial sector that uses vertical line gear are typically known to anchor more frequently over the reef sites.

Spear and Powerhead

Spear guns are used by both the recreational and commercial sector to harvest greater amberjack, but represent a relatively minor component of both. Barnette (2001) summarizes a previous study that concluded spearfishing on reef habitat may result in some coral breakage. In addition, there could be some impacts from divers touching coral with hands or from re-suspension of sediment by fins (Barnette 2001).

Alternative 1 maintains the current ACLs and ACTs and would not be expected to alter the execution of the reef fish fishery, and therefore would not be expected to have any substantial change or effects to the physical environment or EFH. **Preferred Alternative 2** would reduce the ACL by 33% in 2018, and 14% in 2019, and increase it by 2% in 2020 relative to **Alternative 1**. **Alternative 3** would set the ABC at the lowest level recommended by the Science and Statistical Committee (SSC) at their March 2017 meeting for 2018+ based upon the SEDAR Update Assessment (2016), and either **Option a**, apply the new ACL/ACT Control Rule Buffer: Commercial Buffer = 13% and Recreational Buffer = 17% or **Option b**, do not use the ACL/ACT Control Rule Buffer. The ACL for **Alternative 3** would be 46% reduction from **Alternative 1**. **Alternative 4** would restrict all harvest representing the greatest change (magnitude) from status quo. **Preferred Alternative 2** and **Alternative 3** reduce directed harvest, as compared to **Alternative 1,** and would be beneficial to the physical environment. However, these positive effects are expected to be minimal as this reduction in the harvest of greater amberjack is not expected to alter the execution of the reef fish fishery as a whole because those vessels that currently harvest greater amberjack are expected to continue to fish for other reef fish species. While **Alternative 4** restricts all harvest, this reduction in the harvest of greater amberjack is also not expected to alter the execution of the reef fish fishery as a whole. Therefore, any positive effects are expected to be minimal.

4.1.2 Direct and Indirect Effects on the Biological Environment

Management actions can directly impact the biological and ecological environment, including fishing mortality and the resulting population size, life history characteristics, and the role of the species within its habitat. Removal of fish from the population through fishing reduces the overall population size and reproductive potential. **Preferred Alternative 2** and **Alternatives 3,** and **4** reduce directed harvest as compared to **Alternative 1. Alternative 3** would set a constant ABC at the lowest level recommended by the SSC at their March 2017 meeting for 2018 and beyond, and **Alternative 4** would restrict all harvest. **Preferred Alternative 2** would reduce harvest as compared to **Alternative 1** in 2018 and 2019, but would increase harvest by 2% in 2020. **Preferred Alternative 2** and **Alternatives 3** and **4** would be expected to be beneficial to greater amberjack, as they would allow the stock to rebuild due to decreased harvest levels. **Preferred Alternative 2** is expected to end overfishing and rebuild the stock by 2027, **Alternative 3** by 2024, and **Alternative 4** by 2022. However, none of the alternatives are expected to result in any significant impacts on the biological environment because they are not expected to alter the execution of the reef fishery as a whole. Vessels that target greater amberjack are expected to continue to fish for other reef fish species.

4.1.3 Direct and Indirect Effects on the Economic Environment

Modifications to greater amberjack ABCs and associated sector specific ACLs and ACTs (commercial and recreational) considered in this framework action would be expected to result in short- and long-term economic effects. In general, although smaller ACLs and associated ACTs are expected to result in diminished economic benefits in the short run, they would be expected to result in faster rebuilding of the greater amberjack stock, thereby resulting in greater economic benefits in the longer term. Conversely, larger ACLs and associated ACTs would be expected to result in increased economic benefits in the short run but could result in smaller long-term economic benefits due to slower rebuilding of the stock.

Given current available data, economic effects on the commercial sector are expressed in terms of changes in ex-vessel revenues and those on the recreational sector as changes in consumer surplus (CS) to recreational anglers. The economic effects on the for-hire vessel segment of the recreational sector may be generally expressed in terms of changes in producer surplus (PS) as proxied by net operating revenues (NOR). A critical component in assessing the changes in NOR is the expected change in for-hire vessel trips. There is a good possibility that changes in ACL/ACT, and seasonal as well as quota closures, would result in changes in for-hire vessel trips. The magnitude of these possible changes, however, cannot be determined, thus the economic effects on for-hire vessels cannot be estimated. At any rate, the NOR value per angler trip has been estimated at $155 (2015 dollars) for charter vessels $54 (2015 dollars) for headboats.

Alternative 1 (No Action), would maintain the current greater amberjack ABC and associated commercial and recreational ACLs and ACTs. **Alternative 1** is not expected to affect recreational or commercial fishing for greater amberjack and would therefore not be expected to result in effects to the economic environment. The fact that this alternative would provide for an

ABC that exceeds the current SSC recommendation renders it a non-viable alternative. The rest of the alternatives would set the ABC equal to or less than those recommended by the SSC. Because the current sector specific ACTs are used for management purposes, they are considered as baselines for evaluating the economic effects of the various alternatives on the commercial and recreational sectors.

The effects on the commercial sector are summarized in Tables 4.1.3.1-4.1.3.3 and those for the recreational sector, in Tables 4.1.3.4-4.1.3.6. **Preferred Alternative 2a** refers to **Preferred Alternative 2**, **Preferred Option a**, and **Alternative 2b** refers to **Alternative 2**, **Option b**; similar references apply to **Alternatives 3a** and **3b**. In generating these tables, it is assumed that the ACL/ACT under any of the alternatives would be fully taken and the ex-vessel price per pound does not vary from month to month or from year to year. For the current purpose, an average price per pound of $1.38 (2015 dollars) is used. This is the average price per pound of greater amberjack for the years 2011 through 2015.

Table 4.1.3.1 shows the commercial ACT under **Alternative 1** and the differences of the various proposed ACL/ACT alternatives from the ACT under **Alternative 1**. All the differences are negative in the first year but would become positive in 2020 and beyond for **Preferred Alternative 2a** and 2019 and beyond for **Alternative 2b**. The rest of the alternatives show negative differences for all years. **Preferred Alternative 2a** and **3a** would have the same landings reductions in 2018 but vary thereafter; a similar case holds for **Alternatives 2b** and **3b**. As discussed in Chapter 2, the ACLs for **Alternatives 3a** and **3b** would remain fixed throughout the rebuilding period.

The changes in ex-vessel revenues for the first three years of the rebuilding period are shown in Table 4.1.3.2. For the first three years of the rebuilding period, **Alternative 2b** would provide the largest positive economic effects. On the other end, **Alternative 4** would result in the largest reduction in ex-vessel revenues. On average (2018-2020), **Alternative 2b** would result in a revenue increase of approximately $9,000 per year while **Alternative 4** would result in ex-vessel revenue reduction of approximately $544,000 per year. The positive effects of **Alternative 2b** in 2019 and 2020 would outweigh its negative effects in 2018, but the positive effects of **Alternative 2a** in 2020 would be too small to outweigh its negative effects in the earlier years.

The ACL/ACT alternatives would rebuild the greater amberjack stock at different times in the future. **Preferred Alternative 2a** and **Alternative 2b** are projected to rebuild the stock by 2027; **Alternatives 3a** and **3b** by 2024; and, **Alternative 4** by 2022. Due to these varying dates and the lack of specifics on future management after the stock is rebuilt, including the ACL/ACT levels, the alternatives may not be properly compared. Given this caveat, some insights into the cost/benefit of each alternative in rebuilding the stock are presented in Table 4.1.3.3. Total effects of each alternative are the sum of annual effects from 2018 through the year (2027, 2024, or 2022) the stock is rebuilt. The net present values (NPV) are also presented to express future values in terms of present dollars. The positive effects in **Preferred Alternative 2a** and **Alternative 2b** represent the sum of annual ex-vessel revenue changes over the rebuilding period (2018 through 2027). In this sense comparing **Preferred Alternative 2a** with **Alternative 2b** may be appropriate. The negative effects in **Alternatives 3a, 3b, and 4** may be seen as the cost (in terms of ex-vessel revenues) of rebuilding the stock. To an extent, these ex-vessel revenue

reductions may be seen as the minimum amounts that would have to be recouped after the stock is rebuilt, for example, through ACL/ACT increases. Because **Alternatives 3a and 3b** have the same rebuilding period, the two alternatives may be comparable with each other but not with the other alternatives.

For the first three years of the rebuilding period (2018-2020) and relative to the no action alternative, the alternatives may be ranked (descending order) in terms of economic benefits as follows: **Alternative 2b**, **Alternative 2a**, **Alternative 3b**, **Alternative 3a**, and **Alternative 4**. Ranking of alternatives beyond the first three years cannot be adequately determined mainly because of the different timeframe for rebuilding the stock. While **Alternative 2b** may still be considered better than **Alternative 2a**, it is not possible to make the same assertion with respect to the other alternatives.

Table 4.1.3.1. Commercial sector changes (lb ww) in ACT/ACL from Alternative 1. The ACT for **Alternative 1** is used for reference only.

	Alternative 1	**Preferred Alternative 2a**	**Alternative 2b**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**
2018	394,740	(117,089)	(75,600)	(117,089)	(75,600)	(394,740)
2019	394,740	(44,974)	7,290	(117,089)	(75,600)	(394,740)
2020 +	394,740	26,671	89,640	(117,089)	(75,600)	(394,740)

Note: negative numbers are enclosed in parentheses.

Table 4.1.3.2. Commercial sector changes in ex-vessel revenues from **Alternative 1**.

	Preferred Alternative 2a	**Alternative 2b**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**
2018	($161,583)	($104,328)	($161,583)	($104,328)	($544,741)
2019	($62,064)	$10,060	($161,583)	($104,328)	($544,741)
2020	$36,806	$123,703	($161,583)	($104,328)	($544,741)
Total	($186,841)	$29,435	($484,748)	($312,984)	($1,634,224)
Average	($62,280)	$9,812	($161,583)	($104,328)	($544,741)

Note: negative numbers are enclosed in parentheses and no discounting is applied.

Table 4.1.3.3. Total commercial sector changes in ex-vessel revenues from Alternative 1 for the entire rebuilding period assuming the 2020 ACL/ACT is maintained throughout the remaining rebuilding years inclusive of the year the stock is rebuilt.

	Preferred Alternative 2a	**Alternative 2b**	**Alternative 3a**	**Alternative 3b**	**Alternative 4**
Rebuilt Year	2027	2027	2024	2024	2022
Total Nominal	$70,801	$895,358	($1,131,080)	($730,296)	($2,723,706)
NPV*	($13,257)	$556,466	($870,817)	($562,254)	($2,233,546)

*NPV is net present value using a 7% discount rate.
Note: negative numbers are enclosed in parentheses.

The three tables for the recreational sector present similar information as those for the commercial sector, only this time, the changes are in number of fish and angler CS, instead of pounds of fish and ex-vessel revenues. Table 4.1.3.4 shows the changes in number of fish under each ACL/ACT alternatives relative to **Alternative 1**. The number of fish for **Alternative 1** is presented for reference purposes only. The ACLs/ACTs provided in Chapter 2 are in pounds whole weight (ww). For the current purpose, these were converted into number of fish using the average weight for greater amberjack of 23.81 pounds per fish. Unlike the case with the commercial sector, there is only one positive number shown in Table 4.1.3.4 and is associated with **Alternative 2b** in 2020 and thereafter.

Changes in CS for the period 2018 through 2020 are shown in Table 4.1.3.5. The positive effects of **Alternative 2b** in 2020 would not be enough to outweigh the CS reductions in the first two years, resulting in CS reductions for the three-year period. Thus, no alternative would result in positive CS effects for the period 2018-2020. Among the alternatives, **Alternative 2b** would result in the smallest CS reduction while **Alternative 4**, the largest CS reduction.

The same caveat noted earlier for the commercial sector (Table 4.1.3.3) holds for Table 4.1.3.6. Based only on the total effects over the rebuilding period, **Preferred Alternative 2a** and **Alternative 2b** may be comparable with each other but not with the other alternatives. In a similar vein, **Alternatives 3a and 3b** may be comparable with each other but not with the other alternatives. **Alternative 2b** would result in the largest CS increases over the rebuilding period (2018-2027) and may be considered better than **Preferred Alternative 2a**. It cannot be determined if **Alternative 2b** is better than **Alternatives 3a, 3b,** or **4** because of the uncertainty of the management regime under these latter alternatives after the stock is rebuilt in a timeframe that is shorter than that in **Alternative 2b**. The negative effects of **Preferred Alternative Alternatives 2a, Alternative 3a, Alternative 3b,** and **Alternative 4** may be considered the minimum amount to be recouped under these alternatives after the stock is rebuilt.

The ranking of alternatives for the recreational sector is similar to that for the commercial sector. For the first three years of the rebuilding period (2018-2020) and relative to the no action alternative, the alternatives may be ranked (descending order) in terms of economic benefits as follows: **Alternative 2b**, **Preferred Alternative 2a**, **Alternative 3b**, **Alternative 3a**, and **Alternative 4**. Ranking of alternatives beyond the first three years cannot be adequately determined mainly because of the different timeframe for rebuilding the stock. While **Alternative 2b** may still be considered better than **Alternative 2a**, it is not possible to make the same assertion with respect to the other alternatives.

Table 4.1.3.4. Recreational sector changes (number of fish) in ACT/ACL from Alternative 1. The ACT for **Alternative 1** is used for reference only. The pound to fish conversion rate is the average weight of 23.81 lb ww per fish.

	Alternative 1	Preferred Alternative 2a	Alternative 2b	Alternative 3a	Alternative 3b	Alternative 4
2018	45,879	(15,800)	(9,639)	(15,800)	(9,639)	(45,879)
2019	45,879	(7,988)	(227)	(15,800)	(9,639)	(45,879)
2020 +	45,879	(226)	9,124	(15,800)	(9,639)	(45,879)

Note: negative numbers are enclosed in parentheses.

Table 4.1.3.5. Recreational sector changes in angler CS from **Alternative 1.**

	Preferred Alternative 2a	Alternative 2b	Alternative 3a	Alternative 3b	Alternative 4
2018	($191,023)	($116,539)	($191,023)	($116,539)	($554,674)
2019	($96,571)	($2,743)	($191,023)	($116,539)	($554,674)
2020	($2,735)	$110,312	($191,023)	($116,539)	($554,674)
Total	($290,329)	($8,970)	($573,068)	($349,618)	($1,664,021)
Average	($96,776)	($2,990)	($191,023)	($116,539)	($554,674)

Note: negative numbers are enclosed in parentheses.

Table 4.1.3.6. Total recreational sector changes in angler CS from Alternative 1 for the entire rebuilding period assuming the 2020 ACL/ACT is maintained throughout the remaining rebuilding years inclusive of the year the stock is rebuilt.

	Preferred Alternative 2a	Alternative 2b	Alternative 3a	Alternative 3b	Alternative 4
Rebuilt Year	2027	2027	2024	2024	2022
Total Nominal	($309,477)	$763,214	($1,337,158)	($815,775)	($2,773,368)
NPV*	($277,141)	$464,028	($1,029,476)	($628,064)	($2,274,271)

*NPV is net present value using a 7% discount rate.
Note: negative numbers are enclosed in parentheses.

4.1.4 Direct and Indirect Effects on the Social Environment

Greater amberjack has been overfished in all years since 1987 and has been undergoing overfishing since 1985. Following the 2014 stock assessment (SEDAR 33 2014), the rebuilding plan was revised (GMFMC 2015), reducing the ACL by 60,000 lbs whole weight (ww) and setting the sector ACTs at a 15% commercial buffer and 13% recreational buffer. Additional actions modified sector specific harvest restrictions (see Section 4.2.4). Nevertheless, a 2016 update assessment found that the stock is still overfished and undergoing overfishing (SEDAR

33 Update 2016). Thus, the current ABC of 1.72 million pounds (mp) ww (**Alternative 1**) is not projected to rebuild the stock and must be modified.

Alternative 4 would reduce the ACL to zero, essentially prohibiting all harvest of greater amberjack by both the recreational and commercial sectors. **Alternative 4** would result in the greatest negative short-term effects as fishermen would continue to encounter greater amberjack while fishing, but be required to release them. Throwing fish back is considered wasteful by fishermen, especially when the fish appears unlikely to survive. At the same time, the complete prohibition on harvest would allow the stock to rebuild in the shortest time period, by 2022 under **Alternative 4**, resulting in positive effects. However, the long-term benefits of a rebuilt stock would not likely mitigate the negative short-term impacts from a complete multi-year prohibition on harvest, as fishermen have expressed frustration in public testimony about the complete closure on harvest currently in place for the remainder of 2017.

Both **Preferred Alternative 2** and **Alternative 3** propose the same reduced ACL for 2018, resulting in similar effects for that year. While **Alternative 3** would retain the reduced 2018 ACL in subsequent years, the ACL under **Preferred Alternative 2** would increase in 2019 and again in 2020. Under **Preferred Alternative 2**, the ABC would be 74,000 lbs ww greater in 2020 than the current ACL (**Alternative 1**). Thus, the short-term impacts would be least under **Preferred Alternative 2** in 2020 among the alternatives. For all years, the short-term impacts would be greater under both **Preferred Alternative 2** and **Alternative 3** compared to **Alterative 1**, but less than the short-term impacts under **Alternative 4**.

Greater short-term negative effects from a lower ACL would be expected to be offset by the long-term benefits from a rebuilt stock, which would be expected to allow for a higher harvest level. Under **Preferred Alternative 2**, the stock is projected to be rebuilt by 2027, while under **Alternative 3**, it would be rebuilt by 2024. Thus, the long-term benefits of a rebuilt stock would be realized sooner under **Alternative 3** compared to **Preferred Alternative 2**. Under **Preferred Alternative 2**, the ACL would be reduced for only 2 years compared to **Alternatives 1** and **3**, but is projected to take 3 years longer to rebuild than **Alternative 3**. Thus, **Preferred Alternative 2** represents the best balance between negative short-term impacts and positive long-term benefits among the alternatives.

In the event the ACL is exceeded, a sector-specific post-season AM would be triggered that reduces the ACL in the following year by the amount of a sector's overage. The options under **Preferred Alternative 2** and **Alternative 3** propose to use an ACT for management (**Preferred Option 2a** and **Option 3a**) or not to use an ACT for management (**Options b**). By using an ACT, it would be less likely for the ACL to be exceeded, triggering the post-season AM. Although projecting the fishing season based on the ACL (**Options b**) could allow for a longer season in the short-term, negative effects would be expected the following year from an ACL overage, both due to a lower ACL and the likelihood of the stock not rebuilding as expected. Thus, the use of the ACT (**Preferred Option 2a** and **Option 3a**) would be more likely to avoid a post-season overage adjustment and ensure that the stock rebuilds.

4.1.5 Direct and Indirect Effects on the Administrative Environment

Alternative 1 maintains the current commercial and recreational ACLs and ACTs and thus is not expected to alter the administrative burden. **Preferred Alternative 2** would set the commercial and recreational ACLs based on the new ABC and either **Preferred Option a**, apply the new ACL/ACT Control Rule Buffer for 2018+ or **Option b**, do not use the ACL/ACT Control Rule Buffer. The administrative burden for **Preferred Option a** is expected to be similar to **Alternative 1** for both **Preferred Alternative 2** and **Alternative 3,** as it would retain the ACT as a management target. **Option b** in **Preferred Alternative 2** and **Alternative 3** would remove the ACT and eliminate the buffer between the management target and the ACL. In the recent past, overages have occurred for both the recreational and commercial sectors, and this would become more likely if the ACT was removed as a management target under **Option b**. Under **Preferred Alternative 2 Option a** or **Alternative 3, Option a** would likely have a reduced administrative burden relative to **Option b,** since it would likely require more frequent adjustments to the ACL because of overages in the previous year. **Alternative 4** would set the ABC at zero and would be expected to have less administrative burden than **Alternative 1, Preferred Alternative 2,** or **Alternative 3,** since there would be no harvest of greater amberjack. In-season monitoring would not be required.

4.2 Action 2 – Modify Recreational Season for Greater Amberjack

4.2.1 Direct and Indirect Effects on the Physical Environment

It is unknown how many recreational anglers leave the dock intending to target greater amberjack, or how fishing behavior would change based on the various alternatives for closed seasons. The following comparison of alternatives is based on the number of available fishing days under each alternative. This comparison does not take into account fishing during the closed season or effort shifting outside of the closed season. The impacts to the physical environment may be underestimated in this analysis if there is increased effort shifting outside the closed season. Physical impacts to the environment could occur when gear such as weights, hooks, and anchors hit and damage the substrate and surrounding habitat. Recreational fishers typically use rod and reel or spears to harvest greater amberjack; see Section 4.1.1 for a comparison of gear types and impacts to the physical environment.

The effects of the five alternatives considered under Action 2 to modify the recreational closed season depend on the ACL that is selected in Action 1. **Alternative 5** has proposed closure dates of January 1 through July 31. If a closed recreational season for greater amberjack deters fishermen from making a fishing trip, then **Alternative 5** would likely have the greatest positive impacts on the physical environment because it has the longest fixed closed season of the alternatives considered. However, it is expected effort would shift to another species. The ACL the Council selected in Action 1 may change which alternative would likely have the greatest positive impacts on the physical environment. **Alternative 1** (No Action) would result in a 119-159 day fishing season depending upon the ACT selected, **Alternative 2** would result in a 124-180 day fishing season, **Alternative 3** would result in a 128-244 day fishing season and **Preferred Alternative 4** would result in a 94-184 day fishing season. The comparison of the various closed seasons and their associated fishing days can be found in Table 2.2.1. The alternatives in Action 2 are not expected to alter the overall execution of the reef fish fishery and therefore are not expected to have any substantial change in effects to the physical environment.

4.2.2 Direct and Indirect Effects on the Biological Environment

Alternative 1, the status quo, would not constrain harvest enough to prevent an in-season recreational fishing closure. The recreational season has been closed prior to year-end each of the past 4 years as the ACT was harvested before the end of the calendar year. **Alternatives 2** and **3** and **Preferred Alternative 4** also may not constrain harvest enough to prevent an in-season recreational fishing closure, but are estimated to allow for more total fishing days, resulting in an extended season over **Alternative 1**. **Alternative 5** would be the only alternative that is expected to constrain harvest enough to prevent an in-season closure, as the ACL and ACT (if selected) preferred under Action 1. **Preferred Alternatives 4** and **Alternative 5** would also entirely remove a spring recreational season for greater amberjack, which some stakeholders have requested. Based on the spawning season for greater amberjack **Alternatives 2, 3, 5,** and **Preferred Alternative 4** may provide greater benefits to the resource and biological environment when compared to the status quo. These alternatives would close the recreational fishing season during peak spawning (March - April) (Murie and Parkyn 2008). **Alternative 2**,

closing recreational fishing during the months of March – May, would be consistent with the current commercial fixed closed season. However, little information exists to suggest that closing the greater amberjack recreational sector during the spawning period would provide greater biological benefits to the stock compared to closing them during months including the majority of peak recreational fishing effort (May - August, **Alternative 5**), which reduces fishing days to a greater extent than a March – May closure (**Alternative 3**). Similarly, it is unknown if greater amberjack are more susceptible to fishing mortality during the spawning season. A study by Harris et al. (2007) suggested spawning aggregations of greater amberjack were targeted by fishers in the South Atlantic, but no evidence of this was presented. Diver observations in Belize documented greater amberjack in pair courtship while in schools of 120 fish (Graham and Castellanos 2005). It is unknown if fishers target these schools or aggregations of greater amberjack more heavily during spawning than at other times of the year; therefore, **Alternatives 2, 3, 5** and **Preferred Alternative 4**, are expected to provide positive benefits to the resource by protecting greater amberjack during spawning. Closing the season during spawning is expected to provide a higher percentage of reproductively mature individuals to the spawning pool. The alternatives in Action 2 are not expected to alter the overall execution of the reef fish fishery and therefore are not expected to have any significant effects to the biological environment.

4.2.3 Direct and Indirect Effects on the Economic Environment

Estimates of expected economic effects provided in this section are based on a decision tool developed and updated by National Marine Fisheries Service (NMFS). The assumptions, data and methods used to derive these estimates are detailed in Appendix D. Using this decision tool, the combined economic effects of Action 1 and Action 2 are estimated. Because Action 2 deals only with the recreational sector, the combined effects analysis focuses solely on this sector. In addition, only the economic effects on private anglers are estimated. The economic effects on for-hire vessels cannot be estimated due to issues related to estimating the number of for-hire vessel trips affected by this amendment. Due to data and model limitations, the decision tool only provides estimated economic effects for 2018.

Table 4.2.3.1 presents the alternatives for ACL/ACT and seasonal closures, with resulting quota closure (NONE if there is no quota closure), length of the season or the number of days the fishing season is open, and economic effects in terms of changes in CS. For the current analysis, the recreational ACT is considered a quota for closure purposes. Although **Alternative 1** for ACL/ACT is not a viable alternative, it is nonetheless presented for comparison purposes. As a no action alternative, **Alternative 1** for each action, would retain the current recreational ACT and the June 1-July 31 seasonal closure. As expected, this alternative would have no economic effects as shown in the table with zero CS effects. The fishing season would be expected to last 160 days, with a quota closure occurring on August 9. If the current ACT is maintained, all the other alternatives for seasonal closure would result in longer open season, except the January 1-July 31 seasonal closure (**Alternative 5**), which is the longest seasonal closure. The March 1-May 31 seasonal closure (**Alternative 2**) would add more than a month to the open season and would result in slightly positive CS effects. The rest of the season closure alternatives would result in negative CS effects, mainly because the full ACT would not be taken, given the seasonal distribution of landings.

Alternative 2a and **Alternative 3a** for the ACL/ACT would provide for the same recreational ACL for 2018. Thus, they would be expected to have identical results under any of the seasonal closure alternatives. Their effects would differ only for the subsequent years. For these two ACL/ACT alternatives, the lowest negative CS effects would be approximately -$188,000 for the March 1-May 31 seasonal closure (**Alternative 2**) and the highest would be approximately -$241,000 for the January 1-July 31 seasonal closure (**Alternative 5**). For the same reason, **Alternative 2b** and **Alternative 3b** for ACL/ACT would have identical results. This time, however, the lowest negative CS effects of approximately -$113,000 would be associated with the January 1-June 30 seasonal closure (**Preferred Alternative 4**) and the highest of approximately -$241,000 would come from the January 1-July 31 seasonal closure (**Alternative 5**). As may be expected, a total closure of the fishery as in **Preferred Alternative 4** for ACL/ACT would be expected to have the largest negative CS effects.

Combining both the ACL/ACT and seasonal closure alternatives, the least negative CS effects would be associated with **Alternative 2** (or **Alternative 3**) for ACL/ACT and a January 1-June 30 seasonal closure (**Preferred Alternative 4**). It is important to note that these alternatives would not have the longest open season. As already mentioned, this result is appropriate only for 2018.

Table 4.2.3.1. Combined economic effects of ACL/ACT alternatives (Action 1) and seasonal closure alternatives (Action 2). The predicted quota closure is in addition to the fixed closed season.

Action 1: ACL/ACT	Action 2: Seasonal Closure	Predicted Quota (ACT) Closure	Estimated Season Length	Economic Effects (CS)
Alternative 1	Alt 1: June 1-July 31	9-Aug	160	$0
	Alt 2: March 1-May 31	29-Sep	181	$2,156
	Alt 3: March 1-June 30	NONE	244	($38,406)
	Preferred Alt 4: Jan. 1-June 30	NONE	184	($95,860)
	Alt 5: Jan. 1-July 31	NONE	153	($241,688)
Preferred Alternative 2a	Alt 1: June 1-July 31	29-Apr	119	($193,044)
	Alt 2: March 1-May 31	4-Aug	125	($188,732)
	Alt 3: March 1-June 30	6-Sep	128	($189,408)
	Preferred Alt 4: Jan. 1-June 30	2-Oct	94	($189,594)
	Alt 5: Jan. 1-July 31	NONE	153	($241,688)
Alternative2b	Alt 1: June 1-July 31	15-May	135	($117,486)
	Alt 2: March 1-May 31	19-Aug	140	($118,170)
	Alt 3: March 1-June 30	10-Oct	162	($114,519)
	Preferred Alt 4: Jan. 1-June 30	24-Nov	147	($113,970)
	Alt 5: Jan. 1-July 31	NONE	153	($241,688)
Alternative 3a	Alt 1: June 1-July 31	29-Apr	119	($193,044)
	Alt 2: March 1-May 31	4-Aug	125	($188,732)
	Alt 3: March 1-June 30	6-Sep	128	($189,408)
	Preferred Alt 4: Jan. 1-June 30	2-Oct	94	($189,594)
	Alt 5: Jan. 1-July 31	NONE	153	($241,688)
Alternative 3b	Alt 1: June 1-July 31	15-May	135	($117,486)
	Alt 2: March 1-May 31	19-Aug	140	($118,170)
	Alt 3: March 1-June 30	10-Oct	162	($114,519)
	Preferred Alt 4: Jan. 1-June 30	24-Nov	147	($113,970)
	Alt 5: Jan. 1-July 31	NONE	153	($241,688)
Alternative 4	Alt 1: June 1-July 31	N/A	0	($551,735)
	Alt 2: March 1-May 31	N/A	0	($551,735)
	Alt 3: March 1-June 30	N/A	0	($551,735)
	Preferred Alt 4: Jan. 1-June 30	N/A	0	($551,735)
	Alt 5: Jan. 1-July 31	N/A	0	($551,735)

4.2.4 Direct and Indirect Effects on the Social Environment

Following the 2014 stock assessment (SEDAR 33 2014), the rebuilding plan was further revised (GMFMC 2015) by increasing the recreational minimum size limit and reducing the commercial trip limit. Although the Council considered modifying the recreational fixed closed season at that time, the Council ultimately took no action. Despite increasing the recreational minimum size limit in 2016, the rate of harvest was not reduced sufficiently, and the recreational season was not reopened following the fixed closed season from June 1 through July 31 (**Alternative 1**) as the recreational sector ACL was determined to have been exceeded. Due to the ACL overage, the recreational sector ACL was reduced in the following year. The season was estimated based on the ACT, lowered from the ACL by the established buffer, and the recreational harvest of greater amberjack closed on March 24, 2017 for the remainder of the year. In public testimony, fishermen have objected to further increasing the minimum size limit beyond 34 inches fork length and the bag limit is one fish per person per day. Thus, modifying the fixed closed season from June 1 through July 31 (**Alternative 1**) is needed to constrain the recreational harvest and delay an in-season closure.

Predicted annual landings under the current fixed closed season of June 1 through July 31 (**Alternative 1**) would exceed the recreational sector ACLs under all Action 1 alternatives. The predicted annual landings for the fixed closed seasons proposed under **Alternatives 2 – 3,** and **Preferred Alternative 4** would exceed the recreational sector ACLs in 2018 under Preferred Alternative 2 and Alternatives 3 and 4 in Action 1. Thus, none of these alternatives would be expected to constrain landings to the proposed recreational sector ACLs in Action 1 without triggering an in-season closure before the end of the year. However, selecting **Preferred Alternative 4** would not allow the fishing season to open on January 1, thereby allowing the Council time to determine the appropriate fixed closed season that best avoids an in-season closure through a subsequent framework action.

Modifying the fixed closed season to be January through July (**Alternative 5**) would establish the longest fixed closed season among the alternatives, but would be the only alternative that may be reasonably expected to avoid an in-season closure before the end of the year. Thus, the negative effects from a long fixed season closure may be offset by avoiding an in-season closure before the end of the year. Essentially, there is a trade-off between the length of the fixed closed season and the likelihood of triggering an in-season closure.

The harvest of greater amberjack is currently closed for the duration of the year as the 2016 ACL overage reduced the 2017 ACL to less than 0.50 mp. **Alternative 5** is the only fixed closed season alternative that is predicted to constrain landings to below the 2018 ACL modifications proposed in Action 1. If recreational landings cause the ABC to be exceeded, an overage adjustment would be triggered, reducing the following year's ACL by the amount of the overage, resulting in negative effects in the following year. With a lowered ACL, it may also be more likely to exceed the ACL again, triggering another overage adjustment. With a January through July fixed season closure (**Alternative 5**), predicted landings would be 0.25 mp below the 2018 recreational sector ACLs under Action 1's Alternatives 2 and 3. This may provide a needed buffer in the event the 2017 recreational landings exceed the ACL and an overage adjustment is applied to the 2018 recreational sector ACL. Additionally, a longer fixed season closure may be

preferable to an in-season quota closure because a quota closure would tend to disrupt fishing plans and schedules.

4.2.5 Direct and Indirect Effects on the Administrative Environment

The alternatives in Action 2 are expected to create nominal differences in the direct and indirect impacts on the administrative environment. **Alternative 1** would have the least impact on the administrative environment, because the current fixed closed season June 1 - July 31 is already established for the recreational sector (GMFMC 2008). **Alternatives 2, 3, 5,** and **Preferred Alternative 4**, are expected to have similar impacts on the administrative environment because they would only result in the current seasonal closure (**Alternative 1**) being modified. **Alternatives 1, 2, 3, 5,** and **Preferred Alternative 4,** would all require landings from the recreational sector to be closely monitored for when the quota was projected to be reached so that it is not exceeded. Continued public information and broadcasts by radio and press releases may be necessary to inform stakeholders when harvest for greater amberjack is closed, because it could be a different month and day each year based on natural changes in the resource and shifts in effort.

4.3 Cumulative Effects

The cumulative effects of setting the ACLs and ACTs (quotas) in this framework action are similar to the greater amberjack rebuilding plan in Amendment 35 (GMFMC 2012), which is incorporated by reference and is further summarized below. This analysis found the effects on the biophysical and socioeconomic environments are positive in the long-term, because they would ultimately restore/maintain the stock at a level that allows the maximum benefits in yield and commercial and recreational fishing opportunities to be achieved. However, short-term negative impacts on the socioeconomic environment associated with greater amberjack fishing have occurred and are likely to continue due to the need to limit directed harvest and reduce bycatch mortality. These negative impacts can be minimized by selecting measures that would provide the least disruption to the greater amberjack component of the reef fish fishery while maintaining a ABC and sector quotas consistent with the adjusted ABC, and while also reducing the potential to exceed the ACL and end overfishing.

Analysis of modifying the recreational fixed closed season found the biophysical environmental effects would be positive in the short and long term due to recreational harvest being closed during times of greater amberjack peak spawning and at times of historical high effort. Both of these factors would contribute to greater amberjack stock recovery. While recreational socioeconomic environmental effects are thought be seen in the short term due to a longer fixed closed season, there would be less of a likelihood of an in-season quota closure. This would lead to a positive long term socioeconomic environment as fishing plans and schedules would be less likely to be disrupted. In addition, while longer, the lowest consumer surplus effects were calculated for the Council preferred selected fixed closed season.

The proposed actions are directed towards the management of naturally occurring species in the Gulf of Mexico (Gulf), so the introduction or spread of non-indigenous species should not occur. Additionally, the action does not propose any activity, such as increased ballast water discharge from foreign vessels, which is associated with the introduction or spread on non-indigenous species.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. The Environmental Protection Agency's climate change web page provides basic background information on these and other measured or anticipated effects. In addition, the Intergovernmental Panel on Climate Change has numerous reports addressing their assessments of climate change (http://www.ipcc.ch/publications_and_data/publications_and_data.shtml). Global climate changes could have significant effects on Gulf fisheries; however, the extent of these effects is not known at this time. Possible impacts include temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (Kennedy et al. 2002). Modeling of climate change in relation to the northern Gulf hypoxic zone may exacerbate attempts to reduce the area affected by these events (Justic et al. 2003). It is unclear how climate change would affect reef fishes, and likely would affect species differently. Climate change can affect factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. In addition, the distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms. Climate change may significantly impact Gulf reef fish species in the future, but the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts would occur. Actions in this amendment are not expected to significantly contribute to climate change through the increase or decrease the carbon footprint from fishing.

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. Landings data for the recreational sector in the Gulf are collected through the Marine Recreational Information Program, the Southeast Headboat Survey, and the Texas Marine Recreational Fishing Survey. In addition, the Louisiana Department of Wildlife and Fisheries and the Alabama Department of Conservation and Natural Resources have instituted programs to collect greater amberjack recreational landings information in their respective states. Commercial data are collected through trip ticket programs, port samplers, and logbook programs, as well as dealer reporting through the individual fishing quota program.

Impacts from the *Deepwater Horizon MC252* oil spill are still being examined and peer-reviewed studies are now only just being published. However, the effects of this oil on greater amberjack and other reef fish populations are incomplete and unavailable (see 40 CFR §

1502.22) at this time because studies of the effects of the oil spill are still ongoing. If the oil impacts important habitat for these species or interrupts critical life history stages, the effects could reduce these species' population sizes. The oil itself could have adversely affected adult greater amberjack and other reef fish species. In a recent study, Weisberg et al. (2014) suggested the hydrocarbons associated with *Deepwater Horizon MC252* oil spill did transit onto the Florida shelf and may be associated with the occurrences of reef fish with lesions and other deformities. However, Murawski et al. (2014) reported that the incidence of lesions on bottom dwelling fish declined between 2011 and 2012 in the northern Gulf.

CHAPTER 5. REGULATORY IMPACT REVIEW

5.1 Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; 2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and, 3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866. This RIR analyzes the impacts this action would be expected to have on the greater amberjack component of the Gulf of Mexico (Gulf) reef fish fishery.

5.2 Problems and Objectives

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

5.3 Description of Fisheries

A description of the Gulf reef fish fishery is provided in Section 3.4.

5.4 Impacts of Management Measures

5.4.1 Action 1: Modify the Greater Amberjack Rebuilding Time Period, Annual Catch Limits (ACL), and Annual Catch Targets (ACT)

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

Preferred Alternative 2 Preferred Option a (**Preferred Alternative 2a)** would set the ACL equal to the acceptable biologic catch (ABC) recommended by the Scientific Statistical Committee. **Preferred Alternative 2a** is projected to rebuild the stock by 2027. Over the rebuilding period, direct economic effects expected to result in the commercial sector are estimated at approximately $70,801. Based on an annual discount rate of 7%, the net present value of the expected effects on the commercial sector are estimated at -$13,257. For the recreational sector, economic effects expected to result from **Preferred Alternative 2a** over the rebuilding period are estimated at -$309,477 with a net present value of -$277,141.

5.4.2 Action 2: Modify the Recreational Fishing Season for Greater Amberjack

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

Preferred Alternative 4 would modify the recreational greater amberjack closed season to be January 1 through June 30. In conjunction with the preferred ACL selected in Action1, **Preferred Alternative 4** is expected to result in a 94-day recreational season in 2018. The economic effects expected to result from the combination of preferred alternatives in Actions 1 and 2, as measured by changes in consumer surplus to recreational anglers, are approximately estimated at -$189,594. Based on the Gulf of Mexico Fishery Management Council's (Council) expressed intent to establish a shorter closed season through a subsequent regulatory action, the economic effects to the recreational sector may be mitigated.

5.5 Public and Private Costs of Regulations

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

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

NMFS administrative costs of document preparation, meetings and review ….....$10,000

TOTAL ….....$45,000

5.6 Determination of Significant Regulatory Action

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

CHAPTER 6. REGULATORY FLEXIBILITY ACT ANALYSIS

6.1 Introduction

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

With certain exceptions, the RFA requires agencies to conduct a regulatory flexibility analysis for each proposed rule. The regulatory flexibility analysis is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. In addition to analyses conducted for the Regulatory Impact Review (RIR), the regulatory flexibility analysis provides: 1) A statement of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for the proposed rule; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; 5) an identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule; and, 6) a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

Additional information on the description of affected entities may be found in Chapter 3, and additional information on the expected economic effects of the proposed rule may be found in Chapter 4.

6.2 Statement of the Need for, Objective of, and Legal Basis for the Proposed Action

The purpose and need of the proposed action are presented in Chapter 1. The purpose of this action is to adjust the greater amberjack stock rebuilding time period, ACLs and ACTs, and to incorporate updated stock status information from the 2016 update stock assessment. The 2016 update stock assessment determined that greater amberjack continues to be overfished and

undergoing overfishing. The need for this amendment is to end overfishing and rebuild the greater amberjack stock in the Gulf of Mexico (Gulf).

The Magnuson-Stevens Fishery Conservation and Management Act provides the statutory basis for this proposed rule.

6.3 Description and Estimate of the Number of Small Entities to which the Proposed Action would Apply

The proposed rule would modify the greater amberjack rebuilding time period, annual catch limits (ACL), annual catch targets (ACT), and recreational fishing season. As a result, this rule would directly affect federally permitted commercial fishermen fishing for greater amberjack in the Gulf. Recreational anglers fishing for greater amberjack would also be directly affected by this rule, but anglers are not considered business entities under the RFA. For-hire vessels will also be affected by this action but only in an indirect way. For RFA purposes only, National Marine Fisheries Service (NMFS) has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR § 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including affiliates), and has combined annual receipts not in excess of $11 million for all its affiliated operations worldwide.

From 2010 through 2015, an average of 185 federally permitted commercial vessels per year landed greater amberjack in the Gulf (Table 3.4.1.1). These vessels, combined, averaged 522 trips per year in the Gulf on which greater amberjack were landed and 2,935 trips that did not land any greater amberjack or were taken in the South Atlantic. The average annual total dockside revenues were approximately $0.54 million from greater amberjack, $4.44 million from other species co-harvested with greater amberjack (on the same trips), and $26.75 million from trips in the Gulf on which no greater amberjack were harvested or occurred in the South Atlantic (Table 3.3.1.2). Total average annual revenue from all species harvested by vessels harvesting greater amberjack in the Gulf was approximately $31.74 million, or $171,971 per vessel. These vessels generated approximately 1.7 percent of their total fishing revenues from greater amberjack.

Based on the foregoing revenue information, all commercial vessels affected by the proposed rule may be considered to be small entities.

6.4 Description of the Projected Reporting, Record-keeping and Other Compliance Requirements of the Proposed Action

No duplicative, overlapping, or conflicting federal rules have been identified with this proposed rule.

6.5 Identification of All Relevant Federal Rules, which may Duplicate, Overlap or Conflict with the Proposed Action

The proposed rule would not introduce any changes to reporting and record-keeping and other compliance requirements which are currently required.

6.6 Significance of Economic Impacts on a Substantial Number of Small Entities

Substantial Number of Small Entities Criterion

All directly affected entities have been determined, for the purpose of this analysis, to be small entities. Therefore, the proposed rule would affect a substantial number of small entities.

Significant Economic Impact Criterion

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

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

All entities that are expected to be affected by this proposed rule are considered small entities, so the issue of disproportional effects on small versus large entities does not presently arise.

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

Modifying greater amberjack ACLs and ACTs starting in 2018 is projected to rebuild the stock by 2027. The ACL/ACT modification would result in ex-vessel revenue reductions of approximately $161,000 in 2018 and $62,000 in 2019. Beginning in 2020, ex-vessel revenues would increase annually by approximately $36,000. Over the entire rebuilding period (2018-2027), ex-vessel revenues would increase by approximately $70,000, or $378 per vessel. It is possible that some vessels may experience profit reductions particularly in the first two years of the rebuilding period, but on average the profit reductions would be relatively small because ex-vessel revenues from greater amberjack account for only 1.7% of total ex-vessel revenues for an average vessel. It is expected that more economic benefits, such as higher ex-vessel revenues, may be expected after the stock is rebuilt in 2027 when less stringent measures, such as higher ACLs/ACTs, would be established.

Modifying the Gulf greater amberjack seasonal closure for the recreational sector would have no effects on business entities under the RFA.

6.7 Description of the Significant Alternatives to the Proposed Action and Discussion of How the Alternatives Attempt to Minimize Economic Impacts on Small Entities

Four alternatives, including the preferred alternative as described above, were considered for modifying the ACLs/ACTs for the Gulf greater amberjack. The first alternative, the no action alternative, would maintain the current economic benefits to all participants in the greater amberjack component of the reef fish fishery. By maintaining the current ACL/ACT, this alternative would disregard the best scientific information available and would permit more fishing effort than is recommended by the Scientific and Statistical Committee based on the most recent stock assessment. This alternative would not rebuild the stock. The second alternative, which is the preferred alternative, provides for two options one of which is the preferred option. The non-preferred option would not provide for an ACT by not using the ACL/ACT control rule that would establish a 13% buffer between the ACL and ACT for the commercial sector and a 17% buffer for the recreational sector. In effect, the non-preferred option would establish the ACL as the quota. The quota under this option would be higher than that for the preferred option, thus this option would be expected to result in higher ex-vessel revenues over the rebuilding period than the preferred option. However, by not introducing a buffer between the ACL and ACT, this option would tend to raise the level of management uncertainty in rebuilding the stock by 2027. The third alternative provides for two options, one uses the ABC/ACL control rule and the other does not. The resulting quota, ACT under the first option and ACL under the second option, would be lower than that for the preferred alternative. Thus, either option of this alternative would be expected to result in larger ex-vessel revenue losses over the rebuilding period than the preferred alternative. This alternative is projected to rebuild the stock by 2024. The fourth alternative would establish a zero ACL, and thus would be expected to result in larger ex-vessel revenue losses over the rebuilding period than the preferred alternative or any of the other alternatives. This alternative is projected to rebuild the stock by 2022. The economic effects of each alternative (and option) were estimated without consideration of management measures, which are currently unknown, that would be implemented after the stock is rebuilt.

CHAPTER 7. LIST OF AGENCIES AND PERSONS CONSULTED

Name	Expertise	Responsibility	Agency
John Froeschke	Fishery Biologist	Co-Team Lead – Amendment development, introduction	GMFMC
Kelli O'Donnell	Fishery Biologist	Co-Team Lead – Amendment development, effects analysis, and cumulative effects	SERO
Rich Malinowski	Fishery Biologist	Co-Team Lead – Amendment development, effects analysis, and cumulative effects	SERO
David Records	Economist	Economic environment and Regulatory Flexibility Act analysis	SERO
Ava Lasseter	Anthropologist	Social analyses and Reviewer	GMFMC
Steven Atran	Senior Fishery Biologist	Reviewer	GMFMC
Christina Package-Ward	Anthropologist	Social analyses and Reviewer	SERO
Mara Levy	Attorney	Legal compliance and Reviewer	NOAA GC
Joelle Goodwin	Technical Writer Editor	Regulatory writer and Reviewer	SERO
Susan Gerhart	Fishery Biologist	Reviewer	SERO
Jeff Pulver	Fishery Biologist	Data analysis and Reviewer	SERO
Michael Larkin	Fishery Biologist	Data analysis	SERO
Tony Lamberte	Economist	Economic Analysis an Reviewer	SERO
Assane Diagne	Economist	Economic Analysis, Regulatory Impact Review, and Reviewer	GMFMC
Carrie Simmons	Fishery Biologist	Reviewer	GMFMC
Juan Agar	Economist	Reviewer	SEFSC
Nancie Cummings	Fishery Assessment Biologist	Reviewer	SEFSC

LIST OF AGENCIES CONSULTED

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

NOAA General Counsel
U.S. Coast Guard

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APPENDIX A. RECREATIONAL AND COMMERCIAL ACL/ACT CONTROL RULES

ACL/ACT Buffer Spreadsheet version 4.1 - April 2011 Recalculated 3/28/2017

Greater amberjack Commercial - 2017

sum of points 3
max points 6.0

Buffer between ACLand ACT (or ABC and ACL) Unweighted 22

Min. Buffer	9	min. buffer	User adjustable
Max Unw.Buff	19	max unwt. Buff	
Max Wtd Buff	23	max wtd. buffe	User adjustable

Weighted 13

Component	Element score	Element	Selection	Element result	
Stock assemblag	0	This ACL/ACT is for a single stock.	x	0	0
	1	This ACL/ACT is for a stock assemblage, or an indicator species for a stock assemblage			select
Ability to Constrain Catch	0	Catch limit has been exceeded 0 or 1 times in last 4 years		2	1
	1	Catch limit has been exceeded 2 or more times in last 4 years	x		1
		For the year with max. overage, add 0.5 pts. for every 10 percentage points (rounded up) above ACL	1.0		
		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		not applicable	select
	1	MRIP proportional standard error (PSE) <= 20			select
	2	MRIP proportional standard error (PSE) > 20			0
		Not applicable (will not be included in buffer calculation)	x		0
		Apply this component to commercial fisheries or any fishery under an IFQ program			
Precision of Landings Data Commercial	0	Landings from IFQ program		1	1
	1	Landings based on dealer reporting	x		1
	2	Landings based on other			select
		Not applicable (will not be included in buffer calculation)			select
Timeliness	0	In-season accountability measures used or fishery is under an IFQ	x	0	0
	1	In-season accountability measures not used			select

Sum 3

Weighting factor

	Element weight	Element	Selection	Weighting	
Overfished statu	0	1. Stock biomass is at or above B_{OY} (or proxy).		0.3	select
	0.1	2. Stock biomass is below B_{OY} (or proxy) but at or above B_{MSY} (or proxy).			select
	0.2	3. Stock biomass is below B_{MSY} (or proxy) but at or above minimum stock size threshold (			0.3
	0.3	4. Stock is overfished, below MSST.	x		0.3
	0.35	5. Status criterion is unknown.			select

ACL/ACT Buffer Spreadsheet version 4.1 - April 2011 - Recalculated 3/28/2016

Greater amberjack Recreational - 2017

sum of points	6			
max points	9.0		Buffer between ACLand ACT (or ABC and ACL)	Unweighted 13
Min. Buffer	9	**min. buffer**	User adjustable	Weighted 17
Max Unw.Buff	19	max unwt. Buff		
Max Wtd Buff	25	**max wtd. buffe**	User adjustable	

Component	Element score	Element	Selection	Element result
Stock assemblag	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		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	4.0	
		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 applicabl
	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	x	0
	1	In-season accountability measures not used		
			Sum	6

Weighting factor

	Element weight	Element	Selection	Weighting
Overfished statu	0	1. Stock biomass is at or above B_{OY} (or proxy).		0.3
	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 (		
	0.3	4. Stock is overfished, below MSST.	x	
	0.3	5. Status criterion is unknown.		

APPENDIX B. ACTIONS CONSIDERED BUT REJECTED

2.3 Action 3: Modify the Recreational Minimum Size Limit

Alternative 1: No Action – Do not modify the current recreational minimum size limit of 34 inches fork length (FL)

Alternative 2: Modify the minimum recreational size limit for greater amberjack to 30 inches FL

Alternative 3: Modify the minimum recreational size limit for greater amberjack to 32 inches FL

Alternative 4: Modify the minimum recreational size limit for greater amberjack to 36 inches FL

Discussion

Alternative 1 would maintain the current 34-inch FL recreational minimum size limit that was implemented in 2016 to allow a greater proportion of individuals to reach sexual maturity prior to entering the fishery. Prior to 2016, the minimum size limit was 30 inches FL. There is concern that the increase in the minimum size limit could have increased the average size and weight of harvested fish allowing ACT to be reached sooner, and shortening the recreational fishing season. In 2016, the average weights and lengths of landed greater amberjack were similar to previous years (Figures 2.3.1 and 2.3.2) suggesting there was little effect from increasing the minimum size limit on the rate the ACT was reached. The terminal year of the most recent stock assessment was 2015 thus, the increased minimum size limit (implemented in 2016) was not included.

In 2017, the recreational fishing season was closed on March 24, 2017 as the allowable harvest was achieved. This season was shorter than expected because of the large quota overage in 2016 that reduced the 2017 ACT. Preliminary Marine Recreational Information Program (MRIP) data also suggest that the average size (and weight) of landed fish was larger in 2017 than previous years. It is unknown if this is a result of variability in the data (Proportional Standard Error was 45%), increased size limit, or condition of the stock because the new regulations have only been in effect for two years.

Alternative 2 would reduce the minimum size limit for greater amberjack to 30 inches FL and **Alternative 3** would reduce the minimum size limit to 32 inches FL. **Alternative 4** would increase the minimum size limit for greater amberjack to 36 inches FL. In general, minimum size limits can be used to affect fishing mortality and the spawning potential of the stocks. Approximately 50% of greater amberjack reach sexual maturity by 32 inches FL (D. Murie, personal communication and SERO 2014). Management changes that increase the minimum size limit would be expected to increase the spawning potential of the stock however, there is

concern that the recent increase in minimum size limit or an additional increase to 36 inches FL (**Alternative 4)** would further increase the average size (weight) of animals and increase discards. Given that the minimum size limit of 34 inches FL has been in place only since 2016, it is difficult to predict the effect from a further modification to the minimum size limit on the length of the recreational season.

Table 2.2.1. Proportion of mature females at selected lengths for greater amberjack in the Gulf of Mexico. At each selected length, the proportion of mature females is estimated using logistic regression. The 95% lower (LCL) and upper (UCL) confidence limits are also provided.

Proportion of mature females			
Fork length (FL, in inches)	**Proportion mature**	**LCL**	**UCL**
30	0.11	0.00	0.23
32	0.45	0.23	0.66
34	0.85	0.69	1.00
36	0.97	0.92	1.00

Source: D. Murie, personal communication and SERO 2014.

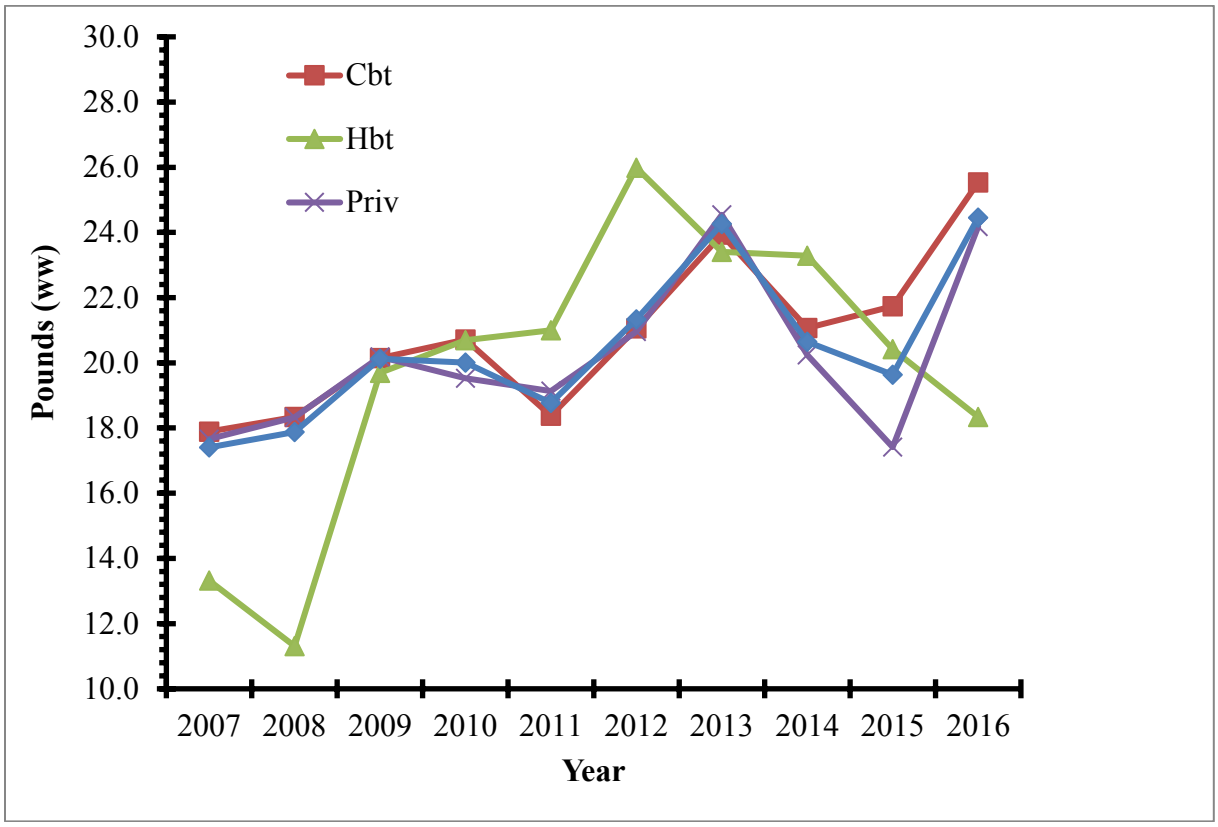

Figure 2.3.1. Average weight (lbs ww) of greater amberjack harvested in the Gulf of Mexico by year and mode.
Source: Southeast Fisheries Science Center recreational (3/20/2017) MRIP dataset.

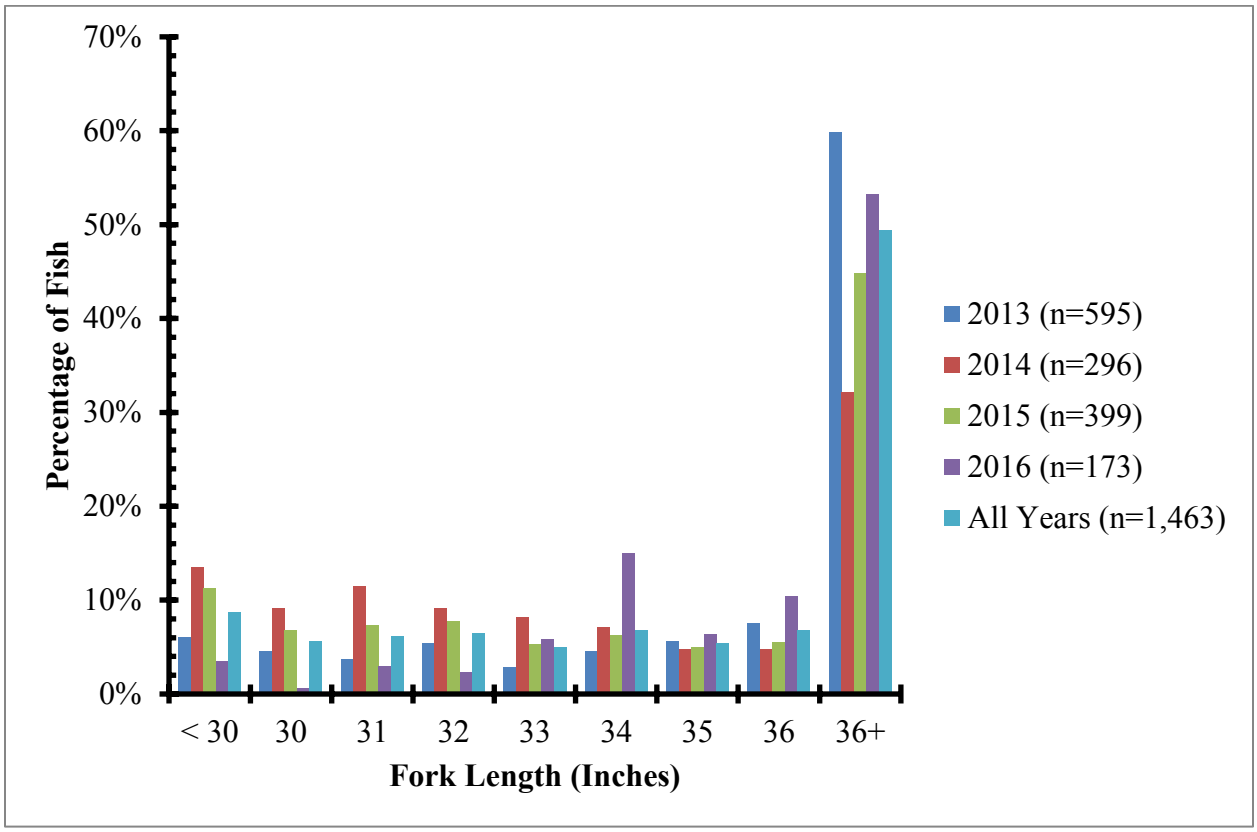

Figure 2.3.2.
Length distribution from 2013 to 2016 of recreational harvested greater amberjack generated from Marine Recreational Information Program (MRIP, n=549), Southeast Region Headboat Survey (SRHS, n=839), LA Creel (n=404), and Texas Parks and Wildlife Division (TPWD, n=67). Note: Length data for 2016 from TPWD was unavailable.

APPENDIX C. BYCATCH PRACTICABILITY

Background/Overview

The Gulf of Mexico Fishery Management Council (Council) is required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) §303(a)(11) to establish a standardized bycatch reporting methodology for federal fisheries and to identify and implement conservation and management measures that, to the extent practicable and in the following order: 1) Minimize bycatch, and 2) minimize the mortality of bycatch that cannot be avoided. The Magnuson-Stevens Act defines bycatch as "fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards. Such term does not include fish released alive under a recreational catch-and-release fishery management program" (Magnuson-Stevens Act §3(2)). Economic discards are fish that are discarded because they are undesirable to the harvester. This category of discards generally includes certain species, sizes, and/or sexes with low or no market value.

Regulatory discards are fish that are required by regulation to be discarded, but also include fish that may be retained but not sold. National Marine Fisheries Service (NMFS) outlines at 50 CFR 600.350(d)(3)(i) ten factors that should be considered in determining whether a management measure minimizes bycatch or bycatch mortality to the extent practicable.

Guidance provided at 50 CFR 600.350(d)(3) identifies ten factors to consider in determining whether a management measure minimizes bycatch or bycatch mortality to the extent practicable. These are:

1. Population effects for the bycatch species.
2. Ecological effects due to changes in the bycatch of that species (effects on other species in the ecosystem).
3. Changes in the bycatch of other species of fish and the resulting population and ecosystem effects.
4. Effects on marine mammals and birds.
5. Changes in fishing, processing, disposal, and marketing costs.
6. Changes in fishing practices and behavior of fishermen.
7. Changes in research, administration, and enforcement costs and management effectiveness.
8. Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources.
9. Changes in the distribution of benefits and costs.
10. Social effects.

The Councils are encouraged to adhere to the precautionary approach outlined in Article 6.5 of the Food and Agriculture Organization of the United Nations Code of Conduct for Responsible Fisheries when uncertain about these factors.

The harvest of greater amberjack is currently regulated with size limits, bag limits, trip limits, quotas, and seasonal closures. These measures are generally effective in limiting fishing

mortality, the size of fish landed, the number of targeted fishing trips, and/or the time fishermen spend pursuing a species. However, these management tools may have the unavoidable adverse effect of creating regulatory discards, which reduces landings. Consequently, the Council is considering in this amendment the practicability of taking additional action to further minimize greater amberjack bycatch.

Greater Amberjack Release Mortality Rates

Commercial Discard Rates

Greater amberjack discard rates were calculated for the Gulf of Mexico (Gulf) vertical line fishery and bottom longline fishery (reef fish and shark longline gears) using both self-reported data (discard coastal logbook) and observer data for the Southeast Data, Assessment and Review (SEDAR) 33 Update (2016). Calculation of discards followed the methods used in the previous SEDAR 33 (2014) assessment and are presented below.

Reef fish and shark observer program data included numbers and lengths of commercially discarded greater amberjack from fishing trips that were observed between July 2006 and December 2015. Discards of greater amberjack included all of the discards reported as greater amberjack as well as a portion of the discards reported as unclassified Seriola. The portion of unclassified Seriola discards included as discards of greater amberjack was estimated based on the proportion of identified greater amberjack less than 60 cm to all unidentified to species *Seriola spp*. less than 60 cm. These portions were derived from trips where all fish were identified to species (most fish reported as unclassified Seriola were below 60 cm). As a result, in the longline fishery, 31.6% of the unclassified Seriola less than 60 cm were assumed to be greater amberjack. For the hand line fishery, 27.1% of the unclassified Seriola less than 60 cm were assumed to be greater amberjack.

For each year from 2007 to 2015, annual discard rates were calculated using observer reported data from the commercial reef fish and shark fisheries. Discard rates were calculated by Gulf region (east and west) and fleet (hand line, reef fish longline permit, and bottom longline shark permit) according to the procedures in McCarthy (2011). A discard rate of zero was assumed for all regions and fleets prior to the implementation of the 36 inch fork length (FL) commercial size limit in 1990 due to retention of all fish harvested. From 1990 to 2006 (years assumed to have commercial discards, but prior to data collection by observers), discard rate was defined as the mean discard rate for the years 2007-2015 by fleet and region. Due to low numbers of observed longline trips per year, the annual discard rates from 2007-2015 for each longline fleet were replaced with the mean rate over the years 2007-2015 by fleet and region. Total discards for each year were calculated as: Year/fleet/region specific discard rate *yearly fleet/region total effort reported to the coastal logbook program. Effort was in hook hours for the vertical line fishery and hooks fished for the longline.

The updated commercial discard estimates were similar to the estimates from SEDAR 33 with only a few exceptions (Figure 1). Moderate deviations occurred in 2012 for the vertical line fishery. Discards for commercial vertical line fleet for the SEDAR 33 Update were lower than those of SEDAR 33 for the 2012 data year (-13.7%). The addition of three new data years (2013-2015) into the discard catch rate estimation model and data revisions were the most likely

reasons for this difference. Similarly, revisions to the longline discard observer data resulted in higher values for the SEDAR 33 Update for 2008 and 2009 (39% and 16%, respectively). The revisions mainly involved additional edits to remove duplicate observations.

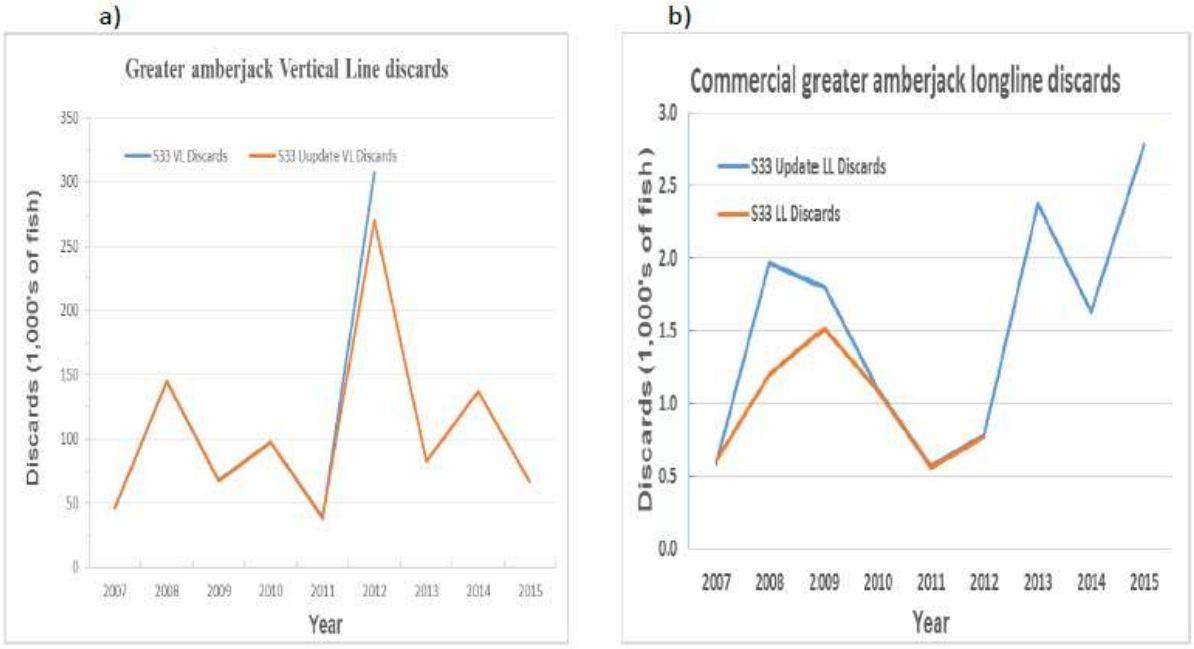

Figure 1. Comparison of commercial greater amberjack discards from: a) vertical line, and b) longline for the SEDAR 33 Update and SEDAR 33 benchmark assessment (SEDAR 33. Update 2016).

Recreational Discard Rates

The sources for the SEDAR 33 Update recreational landings and discard estimates (1981-2015) were obtained from the Marine Recreational Fisheries Statistics Survey (MRFSS) and the Marine Recreational Information Program (MRIP), the Southeast Region Headboat Survey (SRHS), the Texas Parks and Wildlife Department (TPWD), and the Louisiana Creel Survey. Differences in the hindcast headboat catch estimates in the updated assessment were due to applying the SEDAR Best Practices Panel recommendation of "hindcasting recreational catches" since these practices were not available for SEDAR 33. Methods for other recreational estimation followed those used in data workshop for SEDAR 33.

Generally, the updated discard estimates for the recreational fleet were consistently greater than the SEDAR 33 estimates. The greatest difference of 22% was in 1982 and the smallest difference of 14% was in 2002. The headboat discards have also been variable over time. The headboat discard estimates provided for the update were higher than the SEDAR 33 (2014) discards. The differences are due to application of the SEDAR Best Practices recommendations for estimating discard.

Other Bycatch

Species incidentally encountered by the directed greater amberjack fishery include sea turtles, sea birds, and reef fishes. The primary gears of the Gulf reef fish fishery (longline and handline) are classified in the List of Fisheries for 2017 (82 FR 3655) as Category III gear and are

unchanged from the 2016 list. This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to one percent 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.

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

Subsequent to the completion of the biological opinion, NMFS published final rules listing 20 new coral species (September 10, 2014), and designating critical habitat for the Northwest Atlantic Ocean distinct population segment of loggerhead sea turtles (July 10, 2014). NMFS addressed these changes in a series of consultation memoranda. In a consultation memorandum dated October 7, 2014, NMFS assessed the continued operation of the Gulf of Mexico reef fish fishery's potential impact on the newly-listed coral species occurring in the Gulf of Mexico and concluded the fishery is not likely to adversely affect any of the protected coral species. Similarly, in a consultation memorandum dated September 16, 2014, NMFS assessed the continued authorization of South Atlantic and Gulf of Mexico fisheries' potential impacts on loggerhead critical habitat and concluded the Gulf of Mexico reef fish fishery is not likely to adversely affect the newly designated critical habitat. On April 6, 2016, NMFS and the U.S. Fish and Wildlife Service published a final rule (81 FR 20057) removing the range-wide and breeding population ESA-listings of the green sea turtle and listing eight DPSs as threatened and three DPSs as endangered, effective May 6, 2016. Two of the green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, occur in the Gulf and are listed as threatened. In addition, on June 29, 2016, NMFS published a final rule (81 FR 42268) listing Nassau grouper as threatened under the ESA. NMFS has reinitiated consultation on the Reef Fish FMP to address these listings and in a memorandum dated September 29, 2016, NMFS determined that allowing fishing under the Reef Fish FMP to continue during the reinitiation period is not likely to jeopardize the continued existence of the North Atlantic and South Atlantic DPSs of green sea turtles or Nassau grouper. 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)..

Three primary orders of seabirds are represented in the Gulf, Procellariiformes (petrels, albatrosses, and shearwaters), Pelecaniformes (pelicans, gannets and boobies, cormorants, tropic birds, and frigate birds), and Charadriiformes (phalaropes, gulls, terns, noddies, and skimmers)

(Clapp et al., 1982; Harrison, 1983) and several species, including: piping plover, least tern, and roseate tern are listed by the U.S. Fish and Wildlife Service as either endangered or threatened. Note the brown pelican and bald eagle had been listed as endangered or threatened, but have subsequently been delisted. Human disturbance of nesting colonies and mortalities from birds being caught on fishhooks and subsequently entangled in monofilament line are primary factors affecting sea birds. Oil or chemical spills, erosion, plant succession, hurricanes, storms, heavy tick infestations, and unpredictable food availability are other threats. There is no evidence that the directed greater amberjack fishery is adversely affecting seabirds. However, interactions, especially with brown pelicans consuming greater amberjack discards and fish before they are landed, are known to occur (SEDAR 7 2005).

Other species of reef fish are also incidentally caught when targeting greater amberjack. In the Gulf, almaco jack and vermilion snapper and some deep-water groupers are incidentally caught as bycatch when harvesting greater amberjack. Deep-water groupers are caught both in the eastern and western Gulf primarily with longline gear (> 80%). The deep-water grouper fishery was managed with a 1.207-million pound annual catch limit. From 2004 until the implementation of the grouper/tilefish Individual Fishing Quota (IFQ) program in 2010 (SERO 2016), the fishery met their quota and closed no later than July 15 each year. Deep-water grouper closures during this time period may have resulted in some additional discards of grouper by longliners targeting greater amberjack. Since the IFQ program was implemented, deep-water grouper species are landed year-round by holders of IFQ allocation and the quota has not been exceeded. It is unknown how increases in closed season discards might have affected the status of reef fish stocks or the change to an IFQ managed sector.

Practicability of current management measures in the directed greater amberjack fishery relative to their impact on bycatch and bycatch mortality.

The harvest of commercial greater amberjack is managed with a 36-inch FL minimum size limit, March through May seasonal closure, 1,500-lb gutted weight trip limit, and gear restrictions. A 34-inch FL minimum size limit and one-fish bag limit and a June through July seasonal closure are used to manage the recreational harvest of greater amberjack. The following discusses current and proposed management measures with respect to their relative impacts on bycatch.

Size limits

Minimum size limits are estimated to be the greatest source of regulatory discards for the majority of reef fish species. In 1990, a 36-inch FL commercial minimum size limit and a 28-inch FL recreational minimum size limit were implemented for greater amberjack. The recreational size limit was increased to a 30-inch FL minimum size limit in August 2008, and subsequently increased to a 34-inch FL minimum size limit in January 2016.

Closed Seasons

The March through May commercial greater amberjack season closure was implemented in January 1998. The commercial season closure corresponds to the peak period of spawning (Burch 1979; Thompson et al. 1991; Beasley 1993; Harris et al. 2004, Wells and Rooker 2004,

Murie and Parkyn 2008). Discards are thought to be minimal during the closed season because commercial fishermen can avoid targeting schools of greater amberjack. A June through July recreational fishing closure was implemented in 2011 to prevent the quota from being exceeded. (Reef Fish Amendment 35 Appendix 12.4.1, GMFMC 2012). This Framework Action proposes multiple recreational seasonal closure alternatives based off of peak greater amberjack spawning, alignment with the commercial sector, or to provide a lengthier season in the fall. Discards are also thought to be minimal during the closed season because recreational fishermen can avoid targeting schools of greater amberjack. The main objective with changing the current seasonal closure is to allow for more fishing days and to allow the stock to spawn before being harvested.

Bag Limits

A one-fish greater amberjack recreational bag limit has been in effect since 1997. A restrictive bag limit can encourage discards from high-grading once the bag limit is met. However, the minimum size limit likely plays a more significant role in determining the overall number of recreational discards. During 2013 - 2015, approximately 27% of MRFSS trips landing greater amberjack reported catching one or more greater amberjack per angler. This large percentage of trips indicates the potential for discards after the bag limit is met. However, no changes to the bag limit are currently proposed in this regulatory amendment for the recreational harvest of greater amberjack.

Allowable Gear

Greater amberjack commercially harvested are primarily captured by vessels using vertical hook-and-line gear (bandit rigs, manual handlines). Using greater amberjack landings history from 2010- 2015, commercial vertical line gear (i.e., electric reel, bandit rig, hook and line, and trolling) accounted for 73% of the greater amberjack landings, longlines landed 5% of the greater amberjack, spearfishing landed 5% of the greater amberjack, and 17% of the landings were from unclassified gear types (SEFSC Commercial ACL Data February 2017).

The SEDAR 33 (2014) assessment assumed a constant 20% release mortality rate for all gears and fisheries. More research is needed to determine the magnitude and release mortality rates for various gears used to commercially harvest greater amberjack. For instance, commercial red grouper longlines are assumed to have a 45% release mortality rate while vertical-line gear estimates a much lower 10% release mortality rate. Differences in selectivity and discard rates between gears can have a large impact on population status if effort has shifted to one gear type.

Rod-and-reel is the primary gear used in the recreational sector. Circle hooks are used by some anglers when targeting greater amberjack. Some greater amberjack are also caught using spears, which do not affect discards or release mortality because all fish speared are likely harvested. Only undersized fish mistakenly killed while spearfishing would contribute to discard mortality.

Recreational discards are primarily due to the recreational size limits and the one-fish greater amberjack bag limit; however, allowable gears can affect release mortality rates. Amendment 27 to the Reef Fish FMP summarizes various research studies examining the effects of circle hooks, hook sizes, venting tools, and dehooking devices on survival of reef fishes after release

(GMFMC 2007). Efforts are currently underway to improve outreach on proper venting and the increased use of descender devices to reduce mortality for all reef fishes in the Gulf

Alternatives being considered to minimize bycatch

Reductions in dead discards can be accomplished by either reducing the number of greater amberjack discarded or reducing the release mortality rate of discards. To reduce the number of discards, management measures must limit fishing effort or change the selectivity of fishing gears in such a way that reduces the harvest of sub-legal fish. To reduce the discard mortality rate of greater amberjack, sources of release mortality must first be identified (e.g., depth, length, hooking location, surface interval, temperature) and management measures must be imposed to reduce discard mortality rates.

This amendment considers management measures that are expected to affect greater amberjack discard mortality. Discards are anticipated to increase due to decreases in the recreational and commercial annual catch limits and a longer recreational seasonal closure. However, with fishermen being able to avoid schools of greater amberjack, this increase in discards is expected to be minimal.

Practicability Analysis

Criterion 1: Population effects for the bycatch species

Bycatch of greater amberjack due to management measures such as fixed closed seasons, in-season closures, and minimum size limits could result in loss of yield. Changing the seasonal closure is expected to protect greater amberjack during peak spawning, thus improving the status of the stock. Any increase in bycatch of greater amberjack from the directed fishery must be accounted for in stock assessments and when setting the ACL.

Criterion 2: Ecological effects due to changes in the bycatch of greater amberjack (on other species in the ecosystem)

Relationships among species in marine ecosystems are complex and poorly understood, making the nature and magnitude of ecological effects difficult to predict. The Scientific and Statistical Committee (SSC) accepted the projections from SEDAR 33 Update (2017) for the purposes of developing management advice. Greater amberjack are opportunistic predators that feed on benthic and pelagic fishes, squid and crustaceans (GMFMC 2004). Greater amberjack eggs and larvae are pelagic and smaller juveniles (<1 inch standard length) are found associated with pelagic *Sargassum* spp. mats (Bortone et al. 1977; Wells and Rooker 2004). Juveniles then shift to demersal habitats (5 - 6 months), where they congregate around reefs, rocky outcrops, and wrecks (see Section 3.2). Reductions in bycatch and fishing mortality will allow the greater amberjack stock to increase in abundance, resulting in increased competition for prey with other predators. Consequently, it is possible that forage species and competitor species could decrease in abundance in response to an increase in greater amberjack abundance.

Criterion 3: Changes in the bycatch of other species of fish and invertebrates and the resulting population and ecosystem effects

Population and ecosystem effects resulting from changes in the bycatch of other species of fish and invertebrates are difficult to predict. Fishermen can specifically target greater amberjack while they are schooling. Snappers, groupers, and other reef fishes are commonly caught in association with greater amberjack. Those most commonly caught include: almaco jack vermilion and deep-water groupers. None of these species are currently undergoing overfishing although the overfished status of almaco jack and deep-water groupers is unknown (NMFS 2016 Summary of Stock Status for FSSI). Regulatory discards significantly contribute to fishing mortality in all of these reef fish species, especially deep-water groupers.

Criterion 4: Effects on marine mammals and birds

The effects of current management measures on marine mammals and birds are described above. Measures evaluated in this amendment are not expected to significantly affect marine mammals and birds. There is no information to indicate marine mammals and birds rely on greater amberjack for food, and they are not generally caught by fishers harvesting greater amberjack.

Criterion 5: Changes in fishing, processing, disposal, and marketing costs

Reducing the stock ACL will affect costs associated with fishing operations. To the extent that reducing the ACL for greater amberjack would reduce harvest, reductions in commercial revenue and recreational consumer surplus would occur. Commercial fishermen will incur losses in revenue due to limiting the amount of harvest per fishing year. This reduction in revenue is thought to be minimal since fishing effort will most likely shift to another species.

Criterion 6: Changes in fishing practices and behavior of fishermen

Shifts or changes in fishing locations and/or target species due to a decreased ACL or seasons will have an effect on fishing behavior and practices that may potentially affect the bycatch of other reef fish.

Criterion 7: Changes in research, administration, and enforcement costs and management effectiveness

The proposed management measures are not expected to significantly impact administrative costs. Quotas based on stock allocation measures are currently used to regulate the commercial and recreational sectors harvesting greater amberjack. The ACL reduction will require additional research to determine the magnitude and extent of impacts to bycatch and bycatch mortality. Administrative activities such as quota monitoring and enforcement should not be affected by the proposed management measures.

Criterion 8: Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources

If the ACL and ACT for the recreational harvest of greater amberjack are decreased it is expected to positively impact the stock by fostering a faster recovery rate, but may have negative social implications. The past two recreational fishing years have already resulted in closures before the seasonal closure had concluded or even started. It is expected that decreasing the ACL further will lead to an even shorter season.

The same effects of a decreased ACL and ACT are expected to be seen in the commercial sector. The past two commercial fishing seasons have resulted in a closed fishing year soon after the seasonal closure reopening. It is expected that decreasing the ACL further will lead to an even shorter season.

Criterion 9: Changes in the distribution of benefits and costs

Bycatch minimization measures that provide an overall net benefit to the stock and increase the rate of recovery will benefit both sectors in the long run. Bycatch minimization measures are intended to provide an overall net benefit to the stock, by reducing mortality associated with bycatch and increasing the rate of stock recovery.

Criterion 10: Social effects

Bycatch is considered wasteful and it reduces overall yield obtained from the fishery. Minimizing bycatch to the extent practicable will increase efficiency, reduce waste, and benefit stock recovery, thereby resulting in net social benefits.

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APPENDIX D. GULF GREATER AMBERJACK DECISION TOOL

Modeling the Seasonal Closures for the Gulf of Mexico Greater Amberjack Recreational Sector

LAPP/DM Branch
NOAA Fisheries Service
Southeast Regional Office

Introduction

Greater amberjack (*Seriola dumerili*) are one of 31 reef fish species in the Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf of Mexico. The FMP provides management for reef fish species in the federal waters of the Gulf of Mexico.
In 2016, a stock assessment was conducted for the Gulf of Mexico greater amberjack (SEDAR 33 Update). Results from the assessment showed the greater amberjack stock is overfished and experiencing overfishing. A Framework Action is currently being drafted and its purpose is to establish management measures that will rebuild the stock. The current management measures for the recreational sector are a minimum size of 34 inches fork length (FL), closed season from June 1 to July 31, and one greater amberjack per angler bag limit. The Framework Action proposes changes to the Annual Catch Limit (ACL) and Annual Catch Target (ACT). A recreational decision tool was created to allow evaluation of the efficacy of the different closed seasons.

Data Sources

Recreational landings data for Gulf of Mexico greater amberjack were obtained from the Southeast Fisheries Science Center (SEFSC) Marine Recreational Information Program (MRIP), the Texas Parks and Wildlife Department (TPWD) Creel Survey, Louisiana Creel survey (LA Creel) and the Headboat Survey (Headboat). MRIP, TPWD, and LA Creel conducted dockside intercepts to collect information on the size and number of greater amberjack caught by mode (charter, private, shore). The Headboat Survey collected number of greater amberjack through logbooks completed by vessel operators and size information through dockside intercepts.

Methods

Reductions in landings are necessary to achieve the Framework Action's proposed Annual Catch Limits (ACL) and Annual Catch Targets (ACT). The management measure of different closed seasons was explored as a tool to reduce harvest. All the calculations were done using SAS (SAS Institute, Cary, NC).

Predicted Future Landings

The Framework Action currently being drafted will be imposed on the 2018 fishing year. An estimate of the future landings are required to explore the impact of different closed seasons, and determine the predicted landings relative to the ACLs and ACTs.

Frequently future landings are determined from taking a three-year average of the three most recent years of complete data. Therefore, data from 2014 through 2016 are believed to be the best approximation of future harvest patterns. The average landings from 2014-2016 by two-month wave were calculated to be the predicted future landings from January through June. However, the landings may change because the Gulf greater amberjack stock recently had a size limit increase from 30 to 34 inches fork length effective January 2016. The percent reductions from increasing the size limit were analyzed in SERO-LAPP-2014-9 for the 2015 Framework Action and these reductions are shown in Table 1. Therefore, the 2014 and 2015 landings were modified to account for the increase in the size limit. Additionally, the stock has been closed seasonally from June 1 through July 31 every year since 2011. Landings in June were determined from calculating the daily catch rate in May then multiplying it by the number of days in June. This method assumes the daily catch rate in May is the same as the daily catch rate in June. The June landings were calculated using the average landings in May from 2014-2016. The most recent years that the stock was open in August are 2012, 2013, and 2015. These landings were modified for the size limit change then the average daily catch rate for August was determined from 2012, 2013, and 2015 landings because the fishery was open in August during these years. Then the August daily catch rate was applied to July to determine the predicted July landings. This method assumes the daily catch rate in August is the same as the daily catch rate in July. The stock has been closed in September to December every year since 2014. September to December landings were determined from taking the average landings by two-month wave from the most recent years when the recreational sector was open (2011-2013). Details of the landings used to create the predicted future landings are shown in Table 2. The predicted future landings and the landings used to generate the predicted landings are shown in Figure 2.

Table 1. Projected percent reductions of greater amberjack landings by mode for increasing the minimum size limit from 30 to 34 inches fork length. These numbers came from the size limit analysis done for the 2015 Framework Action (SERO-LAPP-2014-09).

Mode	Reduction
Headboat	15.7%
Charter	18.2%
Private	16.3%

Table 2. Details of the landings used to determine the predicted future recreational landings for greater amberjack.

	Jan/Feb	Mar/Apr	May/Jun	Jul/Aug	Sep/Oct	Nov/Dec
Details	2014 and 2015 landings were modified due to the size limit increase. Average landings by wave from 2014-2016.		Determined average daily catch rate for May from 2014-2016 landings and applied it to number of days in June. Pooled average landings from May and June.	Determined average daily catch rate for August from 2012, 2013, and 2015 landings and applied it to number of days in July. Pooled average landings from July and August.	2011-2013 landings were modified due to the size limit increase. Average landings by wave from 2011-2013.	

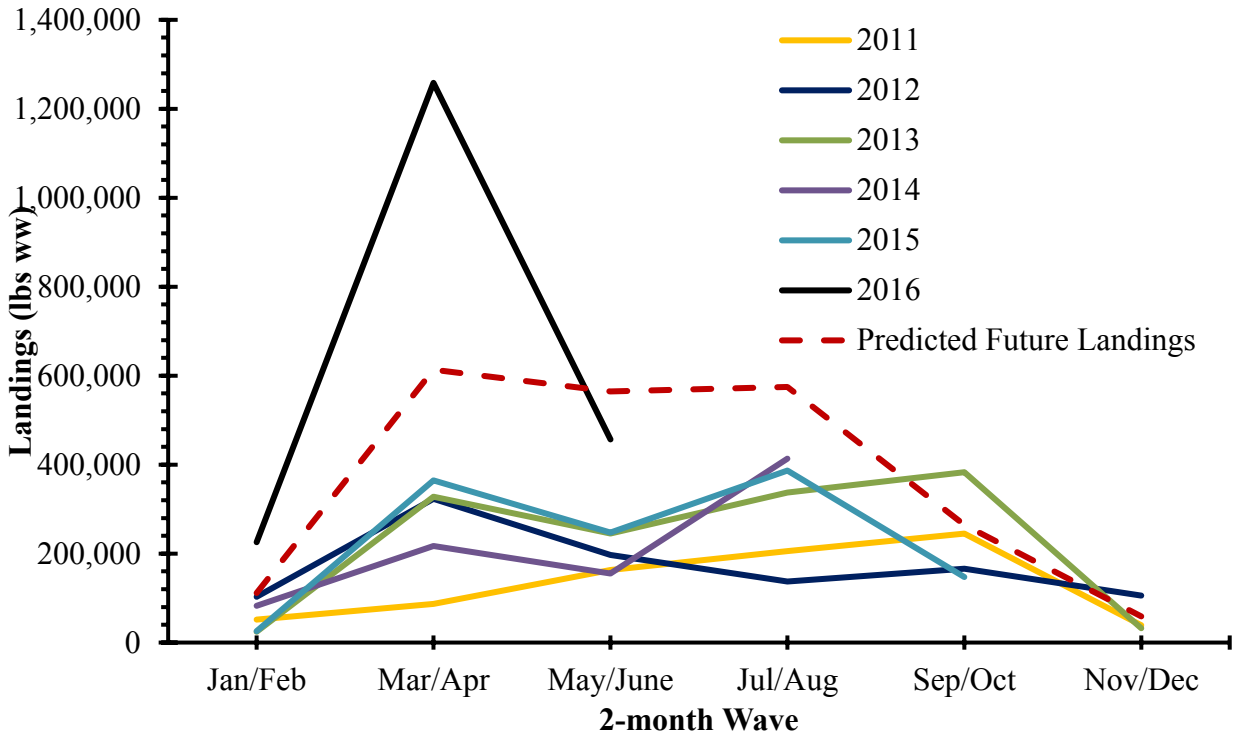

Figure 1. Gulf of Mexico greater amberjack recreational landings by wave from 2011 through 2016 and predicted future landings. All of the landings before 2016 were modified to account for the increase in the size limit implemented in January of 2016. The predicted future landings in May/June and July/August are higher than other years because they have been adjusted for the June-July closure.

Discards and Total Removals

The relative change in dead discards from exploring different regulations was calculated. A baseline of landings was established by assuming no regulation changes and the season was open all year. Then when a regulation change is implemented the reduced landings were converted to numbers of greater amberjack by dividing by the landings by the average weight. The current average weight of greater amberjack for the recreational sector was determined from the most recent assessment (SEDAR 33 Update), and was determined to be 23.81 pounds whole weight. The numbers of greater amberjack released due to a regulation change were converted to dead discards by multiplying against the discard mortality rate of 20%. This discard morality rate came from the most recent assessment (SEDAR 33 Update). Additionally, the landings in weight were converted to numbers of dead greater amberjack by multiplying the landings by the average weight. Then total removals were determined from adding both the dead discards and the greater amberjack landings in numbers of fish.

Closed Season Analyses

Landings of greater amberjack are highly seasonal in the Gulf of Mexico; thus, reductions associated with seasonal closures differ greatly depending upon the time period selected for closure (Figure 2). The Headboat landings are available by month. The MRIP, TPWD, and LA Creel landings are available by two-month wave and were separated into months by multiplying the proportion of days in each month relative to the total days in a wave. For example wave 3 consists of May/June where May has 31 days and June has 30 days (total wave landings = 61 days). Therefore, May landings are estimated by multiplying the wave 3 landings by 0.508 (31/61 = 0.508). The predicted future landings by month are shown in Figure 2.

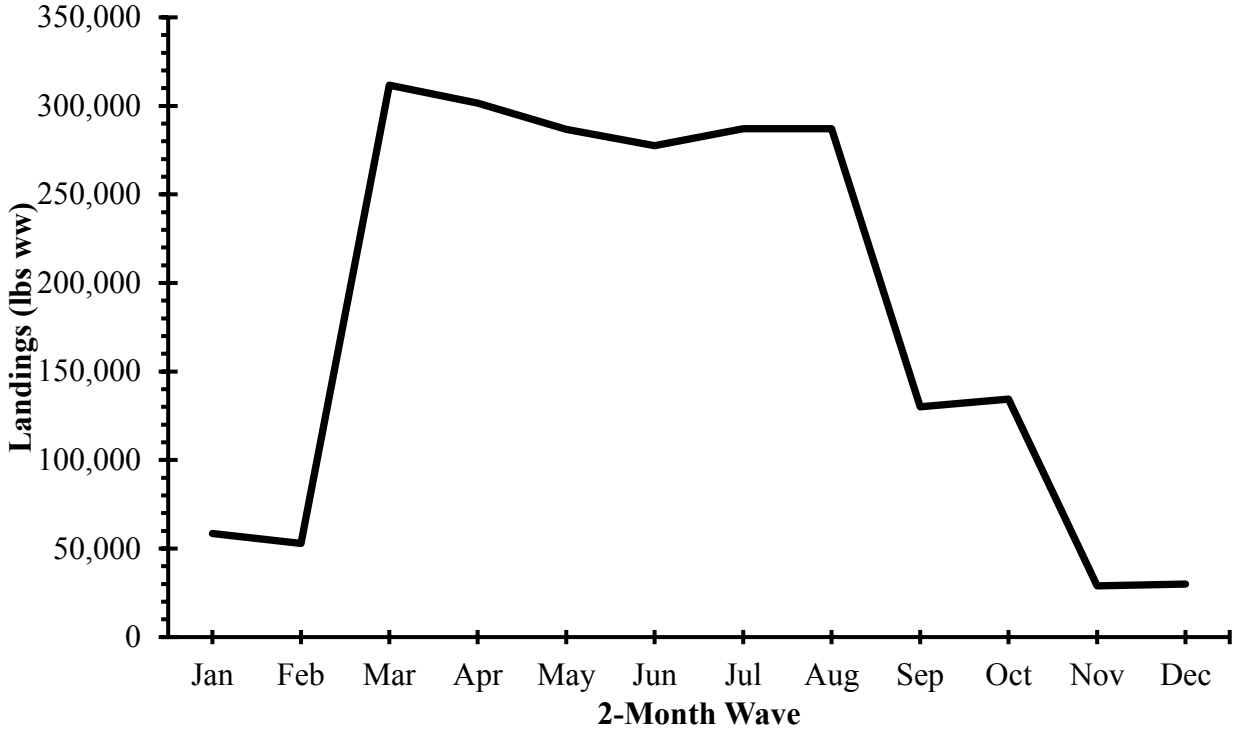

Figure 2. Distribution by month of predicted future landings for the Gulf of Mexico greater amberjack recreational landings. The predicted recreational landings include MRIP, Headboat, TPWD, and LA Creel landings.

The impact of a seasonal closure was modeled by converting the number of days closed into a percentage of days closed for a given month. The projected landings during that month were then reduced by the percentage of the month that was closed.

Decision Tool

Percent reductions calculated from changes in the closed season were applied to predicted future monthly landings to determine how much harvest would be reduced. These results were incorporated into a recreational decision tool. If month (*m*) was 100% closed, landings were set to zero pounds for all sectors. If a month was partially or fully open, the projected monthly recreational landings (RL) were computed as follows:

$$RL_{sector,m} = PRL_{sector,m} * O_m$$

where PRL is the predicted future recreational landings and O is the percent of month open to fishing.

The projected monthly recreational landings (RL) and predicted future landings (PRL), were calculated for each sector (headboat, private, and charter). The sector landings (RL_{sector}) were combined to predict the total recreational landings.

The recreational decision tool (RDT) was implemented in Microsoft Excel using drop-down menus for inputting desired management measures (Figures 3). Excel was chosen because it is widely available for constituent use.

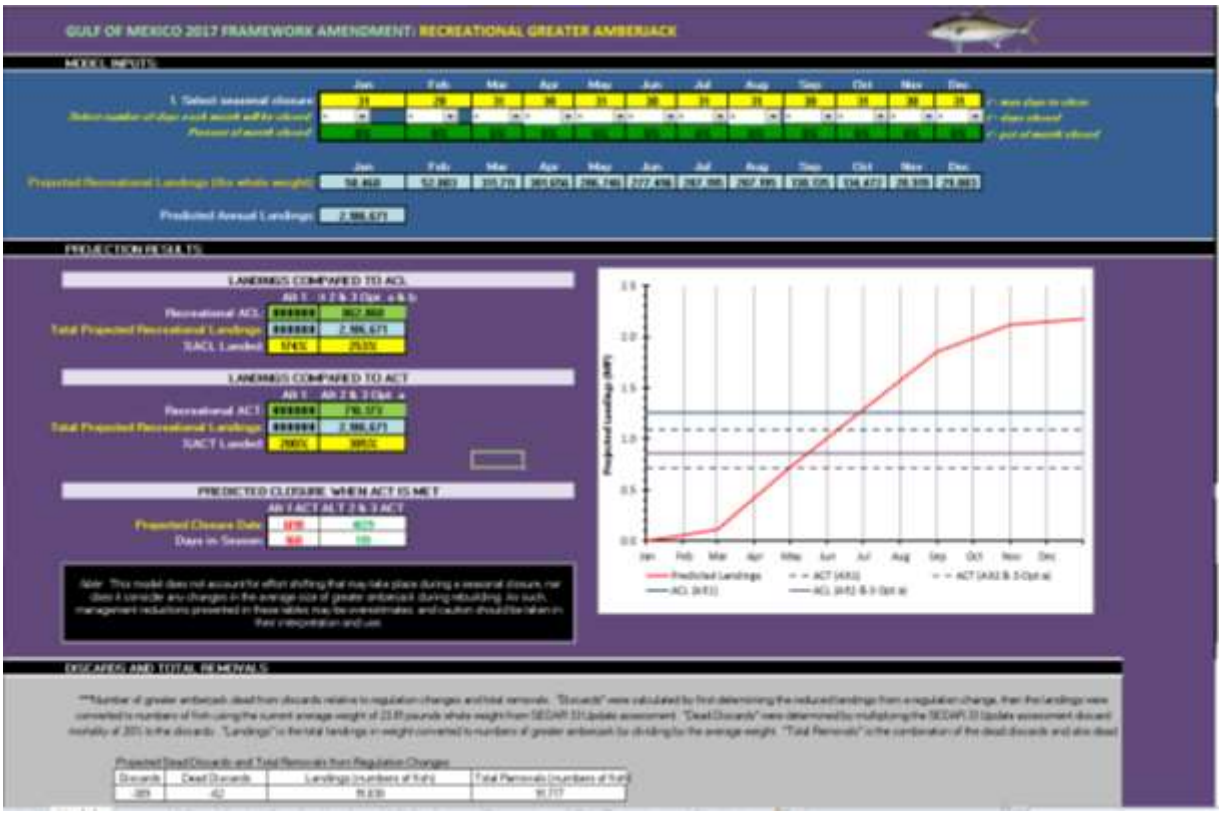

Figure 3. Screenshot for the recreational decision tool.

Results

The RDT allows a range of closed seasons and then the modified landings are compared to the proposed ACTs and ACLs in the Framework Action. Table 3 presents projected recreational annual landings and days open for the fishery from the variety of management alternatives using the current ACT (1,092,372 pounds ww). A mix of management measures can reduce the landing to prevent the ACT from being exceeded.

Table 3. Projected recreational landings (lbs ww) of Gulf of Mexico greater amberjack under a variety of proposed management measures that predict landings below the current ACT of 217,100 lbs ww. These results assume no effort shifting.

Closed Season	Days Open	Total Projected Landings (lbs ww)
Jun – Jul	160	1,621,980
Jan – Jul	184	897,800
Jan – Apr	118	1,462,042
Jul – Dec	160	1,288,872

Discussion

As with most projection models, the reliability of the RDT results are dependent upon the accuracy of their underlying data and input assumptions. We have attempted to create a realistic baseline as a foundation for comparisons, under the assumption that predicted future landings will accurately reflect actual future landings. Uncertainty exists in this projection, as economic conditions, weather events, changes in catch-per-unit effort, fisher response to management regulations, and a variety of other factors may cause departures from this assumption.

The RDT does not incorporate any changes in the average size of greater amberjack during rebuilding. As the stock rebuilds it is likely that the average size will increase. An increased average size would lead to fishermen capturing their quota more rapidly relative to previous years under similar effort levels. All of these factors would result in more pessimistic projections. As such, management reductions may be overestimates, and caution should be taken in their interpretation and use. By contrast, continued adverse economic conditions and rising fuel prices may reduce effort, which would counter these other trends.

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APPENDIX E. OTHER APPLICABLE LAWS

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 (FMP) 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 (ESA) (Section 3.3.3), E.O. 12866 (Regulatory Planning and Review, Chapter 5) and E.O. 12898 (Environmental Justice, Section 3.5). 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. Proposed and final rules will be published before implementing the actions in this amendment.

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 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 Magnuson-Stevens 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.

National Historic Preservation Act

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

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

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

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 United States Fish and Wildlife Service (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. There are no implications to coral reefs by the actions proposed in this amendment.

E.O. 13132: Federalism

The E.O. on Federalism requires agencies in formulating and implementing policies, to be guided by the fundamental Federalism principles. The E.O. serves to guarantee the division of governmental responsibilities between the national government and the states that was intended by the framers of the Constitution. Federalism is rooted in the belief that issues not national in scope or significance are most appropriately addressed by the level of government closest to the people. This E.O. is relevant to FMPs and amendments given the overlapping authorities of NMFS, the states, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate state, tribes and local entities (international too).

No Federalism issues were identified relative to the action to modify the management of the recreational harvest of greater amberjack. 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, Habitat Areas of Particular Concern, and gear-restricted areas in the eastern and northwestern Gulf. The existing areas are entirely within federal waters of the Gulf. They do not affect any areas reserved by federal, state, territorial, tribal or local jurisdictions.

References

GMFMC. 2005. Generic amendment number 3 for addressing essential fish habitat requirements, habitat areas of particular concern, and adverse effects of fishing in the following fishery management plans of the Gulf of Mexico: shrimp fishery of the Gulf of Mexico, United States waters, red drum fishery of the Gulf of Mexico, reef fish fishery of the Gulf of Mexico, coastal migratory pelagic resources (mackerels) in the Gulf of Mexico and South Atlantic, stone crab fishery of the Gulf of Mexico, spiny lobster fishery of the Gulf of Mexico and South Atlantic, coral and coral reefs of the Gulf of Mexico. Gulf of Mexico Fishery Management Council. Tampa, Florida.
http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/FINAL3_EFH_Amendment.pdf