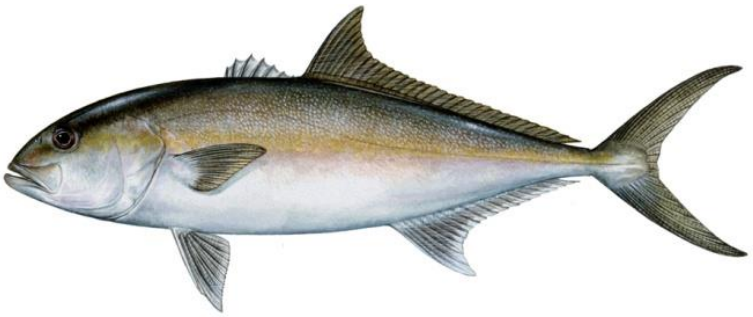
Modifications to Greater Amberjack Allowable Harvest and Rebuilding Plan Options Paper



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

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ENVIRONMENTAL ASSESSMENT COVER SHEET

Name of Action

Modifications to Greater Amberjack Allowable Harvest and Management Measures

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Type of Action

( ) Administrative
(X) Draft
( ) Legislative
( ) Final

ABBREVIATIONS USED IN THIS DOCUMENT

ABC	Acceptable biological catch
ACL	Annual catch limit
ACT	Annual catch target
AMs	Accountability measures
ALS	accumulated landings system
B_{MSY}	Stock biomass level capable of producing an equilibrium yield of MSY
Council	Gulf of Mexico Fishery Management Council
CS	consumer surplus
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential fish habitat
EIS	Environmental impact statement
ELMR	Estuarine living marine resources
ESA	Endangered Species Act
F	Fishing mortality
FL	fork length
FMSY	Fishing mortality rate corresponding to an equilibrium yield of MSY
$F_{30\% SPR}$	Fishing mortality corresponding to 30% spawning potential ratio
FMP	Fishery Management Plan
GMFMC	Gulf of Mexico Fishery Management Council
HAPC	Habitat area of particular concern
IRFA	Initial regulatory flexibility analysis
lbs	Pounds
M	Natural mortality
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	Maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
mp	million pounds
MRFSS	Marine Recreational Fisheries Survey and Statistics
MRIP	Marine Recreational Information Program
MSST	Minimum stock size threshold
MSY	Maximum sustainable yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	Same as NMFS
NOR	net operating revenues
NOS	National Ocean Service
NS1	National Standard 1 guidelines
OFL	Overfishing level
OY	Optimum yield
PS	Producer surplus
PW	Product Weight
RIR	Regulatory impact review

SAV	Submerged aquatic vegetation
Secretary	Secretary of Commerce
SEDAR	Southeast Data, Assessment and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SSBR	Spawning stock biomass per recruit
SSC	Scientific and Statistical Committee
SPR	Spawning potential ratio
TAC	Total allowable catch
TPWD	Texas Parks and Wildlife Department
ww	whole weight
YPR	Yield per recruit

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CHAPTER 1. INTRODUCTION

1.1 Background

Secretarial Amendment 2 (GMFMC 2003) to the Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico (Reef Fish FMP) established a rebuilding plan for greater amberjack based on a stock assessment conducted in 2000 (Turner et al. 2000). That assessment determined that the greater amberjack stock was overfished and undergoing overfishing as of 1998. Management measures to reduce the recreational bag limit from three to one fish were implemented in January 1997 and the commercial season closure from March through May was implemented in January 1998; however, this closure was not incorporated into the 2000 assessment. The projected effects of these management measures were expected to eliminate overfishing; therefore, no new management measures to further restrict effort were implemented.

In 2006, a Southeast Data, Assessment, and Review (SEDAR) updated 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 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 2008). The minimum reduction required to rebuild the stock by 2012 was 40% of current fishing mortality. The total allowable catch (TAC) implemented in Amendment 30A was 1,871,000 pounds (lbs) whole weight for 2008 through 2010 (GMFMC 2008). Amendment 30A also established quotas for the recreational and commercial sectors equal to 1,368,000 lbs and 503,000 lbs, 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 will close that sector for the remainder of the year. Additionally, if a sector's landings exceed that sector's share of the TAC, the Regional Administrator will 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 2010, the greater amberjack update stock assessment was completed reviewed by the SSC at their March 2011 meeting. The SSC determined that the update assessment for greater amberjack (SEDAR 9 Update 2010) was the best scientific information available; however, they did not accept it as adequate for management. Yield projections from the update assessment were unreliable because they showed large sensitivity to small changes in initial conditions, fishing mortality rates, and catch. Therefore, the SSC decided to use Tier 3b from the ABC control rule, in which the ABC is based on the most recent year's landings, for setting the greater amberjack overfishing limit (OFL) and ABC. The Regulatory Amendment implemented in June 2011, specified the greater amberjack recreational closed season from June 1 – July 31.

In December 2012, Amendment 35 (GMFMC 2012) reduced the stock's annual catch limit (ACL), (previously called the TAC), to 1,780,000 lbs in an effort to end overfishing and rebuild the stock. The harvest levels were based on the SSC recommendation of ABC based on the 2010 update stock assessment. The commercial ACL was set at 481,000 lbs, and a recreational ACL

was set at 1,299,000 lbs, based on the interim sector allocation established in Amendment 30A (GMFMC 2008). Annual catch targets (ACTs) (equivalent to quotas) were established at 409,000 lbs for the commercial sector and 1,130,000 lbs for the recreational sector.

A greater amberjack benchmark stock assessment (SEDAR 33) was completed and reviewed by the Scientific and Statistical Committee (SSC) at their June 2014 meeting. The SSC used the acceptable biological catch (ABC) control rule to recommend the following and ABCs for a time period of four years beginning in 2015 equivalent to 75% of MFMT to end overfishing and rebuild the stock.

The greater amberjack stock assessment update to SEDAR 33 was completed in March 2017 and reviewed by the Scientific and Statistical Committee (SSC) at their March 2017 meeting. The SSC accepted the greater amberjack stock assessment as the best scientific information available and concluded that greater amberjack was overfished and undergoing overfishing, and would not be rebuilt by 2019 as previously projected. The SSC provided a new OFL and ABC for a period of three years beginning in 2018 equivalent to yield at 75% of $F_{30\%SPR}$ based on the results of the most recent stock assessment. Table 1.1 below lists the recommended OFLs from the SEDAR 33 Update and SEDAR 33 (2015).

Table 1.1 The annual OFLs (million pounds whole weight) recommended by the scientific and statistical committee at their March 2017 meeting after review of the SEDAR 33 Gulf of Mexico greater amberjack update stock assessment. The corresponding OFLs from the previous SEDAR 33 benchmark assessment are also provided for reference.

OFL (Annual yield at MFMT (MP, ww) = FSPR30%)		
Year	SEDAR 33 update	SEDAR 33
2018	1.500	2.986
2019	1.836	3.068
2020	2.167	3.170

Table 1.2 The annual ABCs (million pounds whole weight) recommended by the scientific and statistical committee at their March 2017 meeting after review of the SEDAR 33 Gulf of Mexico greater amberjack update stock assessment. The corresponding ABCs from the previous SEDAR 33 benchmark assessment are also provided for reference.

ABC (Annual yield at FOY (MP,ww) = 75%FSPR30%		
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 stock ACL, to end overfishing and rebuild the stock.

Landings Data

Table 1.3 Commercial and recreational landings of greater amberjack (pounds whole weight) from 2002 to 2016.

Year	Headboat	Charter	Private	Recreational Total	Commercial	Grand Total
2002	160,636	1,114,754	857,969	1,972,723	703,303	2,676,026
2003	199,347	1,072,018	1,630,455	2,702,473	857,125	3,559,598
2004	108,769	1,068,814	1,214,647	2,283,461	870,953	3,154,414
2005	61,281	365,893	1,089,981	1,455,874	662,285	2,118,159
2006	79,892	1,030,943	589,351	1,620,294	566,384	2,186,678
2007	59,436	516,253	291,797	808,050	589,235	1,397,285
2008	54,544	478,614	785,504	1,264,118	440,936	1,705,054
2009	103,191	653,160	723,964	1,377,124	601,446	1,978,570
2010	53,203	460,740	711,282	1,172,022	534,095	1,706,117
2011	62,835	583,813	303,351	887,164	508,871	1,396,035
2012	99,680	546,086	592,952	1,139,038	308,334	1,447,372
2013	73,246	605,860	941,655	1,547,515	457,879	2,005,394
2014	46,435	333,485	710,128	1,043,613	486,679	1,530,292
2015	58,513	759,017	591,711	1,350,728	458,693	1,809,421
***2016**	20,063	540,507	1,393,732	1,934,239	440,297	2,374,536

Source: Southeast Fisheries Science Center recreational (1/5/2017) and commercial (2/7/2017) ACL datasets. Recreational landings exclude Monroe County, Florida.
*Preliminary

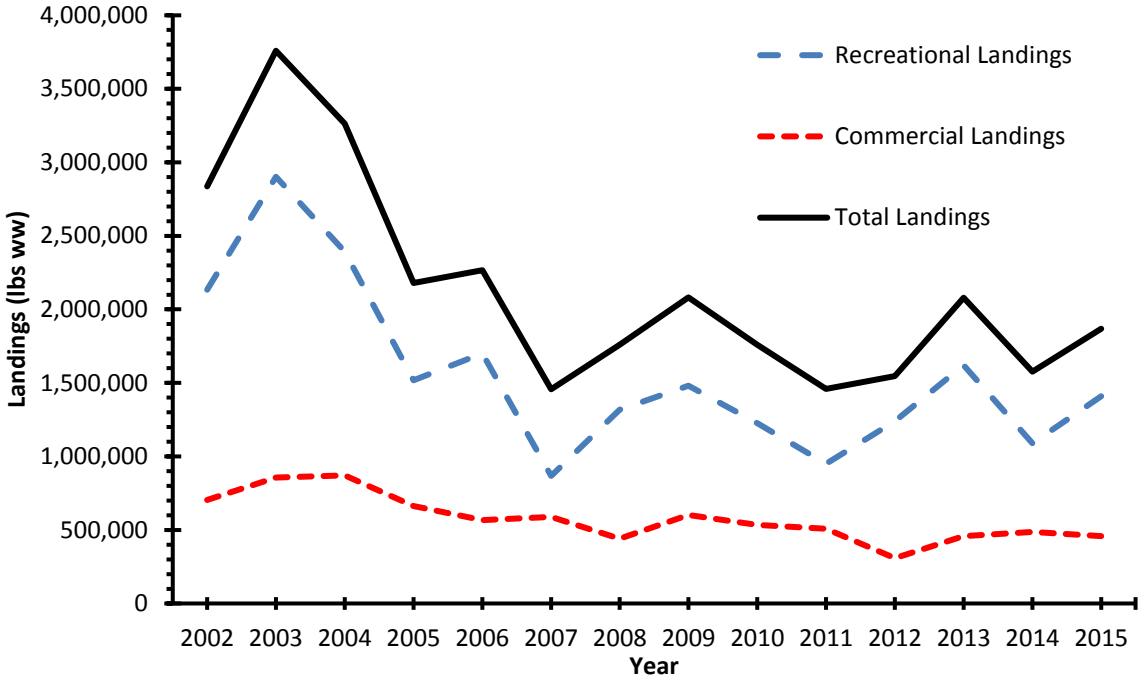

Figure 1.1 Recreational, commercial, and total landings in pounds whole weight of greater amberjack from 2002 through 2015. Recreational landings were estimated (AB1) from the Marine Recreational Information Program, Texas Parks and Wildlife Department, Louisiana Creel, and Southeast Region Headboat Surveys. Source: SEFSC recreational (1/5/2017) and commercial (2/7/2017) ACL datasets.

Table 1.4 Summary of recent annual commercial landings relative to management targets (pounds whole weight).

Commercial						
Year	Landings	ACT	Adjusted ACT	ACL	Adjusted ACL	Closure Date
2008	439,176			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	503,000	237,438	503,000	237,438	3/1/2012
2013	457,879	338,157		481,000	410,157	7/1/2013
2014	486,679	409,000		481,000		8/25/2014
2015	458,693	394,740		464,400		7/19/2015
2016	440,297	394,740		464,400		7/17/2016
2017		394,470		464,400		

Note: The AMs implemented in Amendment 30A (GMFMC 2008) required that the annual commercial harvest exceeding the commercial ACL be deducted from the commercial ACL in the subsequent calendar year. In these cases, the adjusted commercial ACL values are indicated in parentheses. 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 1.5 Summary of recent annual recreational landings relative to management targets (pounds whole weight).

Recreational						
Year	Landings	ACT	Adjusted ACT	ACL	Adjusted ACL	Closure Date
2008	1,264,118			1,368,000		
2009	1,377,124			1,368,000		10/24/2009
2010	1,172,022			1,368,000	1,243,184	
2011	887,164	1,368,000		1,368,000	1,315,224	
2012	1,139,038	1,299,000		1,368,000		
2013	1,547,515	1,299,000		1,299,000		
2014	1,043,613	1,299,000	888,839	1,299,000	1,063,538	8/25/2015
2015	1,350,728	1,092,372		1,255,600		9/28/2015
2016	1,934,239	1,092,372	933,731	1,255,600	1,101,959	6/1/2016
2017		1,092,372	335,741	1,255,600	498,969	3/24/2017

Note: The AMs implemented in Amendment 30A (GMFMC 2008) required that the annual recreational harvest exceeding the recreational ACL be deducted from the recreational ACL in the subsequent calendar year. In these cases, the adjusted recreational ACL values are indicated in parentheses. Also, these overage adjustments are made on preliminary landings as final landings are not available at the beginning of the subsequent fishing year. This may result in minor deviations from the final overage (if any) and the overage deduction.

1.2 Purpose and Need

The purpose of this amendment is to adjust the greater amberjack rebuilding time, ACLs and ACTs, to incorporate updated stock status information from the 2017 stock assessment. The 2017 stock assessment update revealed that greater amberjack continues to be overfished and undergoing overfishing.

The need for this amendment is to adjust catch levels to end overfishing and rebuild the greater amberjack stock in the Gulf of Mexico.

1.3 History of Management

The Reef Fish FMP [with its associated 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 its associated environmental assessment (EA), regulatory impact review (RIR), and initial regulatory flexibility analysis (IRFA)] to the Reef Fish FMP, 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 three-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 by establishing a survival rate of biomass into the stock of spawning age to achieve at least 20% spawning stock biomass per recruit (SSBR), relative to the SSBR that would occur with no fishing. 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 its associated EA and RIR), implemented in May 1992, added the remaining *Seriola* species (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 three years.

Amendment 5 (with its associated supplemental EIS, RIR, and IRFA), implemented in February 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 its associated EA and RIR), submitted in December 1995 and implemented in January 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 its associated EA, RIR, and IRFA), implemented in January 1998, closed the commercial sector for greater amberjack in the Gulf of Mexico during the months of March, April, and May.

Regulatory Amendment with its associated EA, RIR, and IRFA was implemented in August 1999 and 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 four-year sunset clause.

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

Amendment 16B (with its associated EA, RIR, and IRFA), implemented in November 1999, set a slot limit of 14 to 22 inches FL for banded rudderfish and lesser amberjack for both the commercial and recreational fisheries, and an aggregate recreational bag limit of five fish for banded rudderfish and lesser amberjack.

Secretarial Amendment 2 (with associated EIS, RIR and IRFA), implemented in July, 2003 for greater amberjack, specified MSY as the yield associated with $F_{30\% \text{ SPR}}$ (proxy for F_{MSY}) when the stock is at equilibrium, OY as the yield associated with an $F_{40\% \text{ SPR}}$ 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 seven 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 associated EIS, RIR, and IRFA), implemented August 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 quotas.

Regulatory Amendment with associated EA, RIR, and IRFA implemented in June 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 associated EA, RIR, and IRFA), 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 annual catch limit of 1,830,000 lbs. Reducing the stock ACL by 18% from no action was expected to end overfishing. The rule also established a commercial trip limit of 2,000 lbs throughout the fishing year. The council also considered bag limits and closed season management measures for the recreational fishing sector but did not alter any recreational management measures.

2015 Framework Amendment with associated EA, RIR, and IRFA implemented on January 4, 2015, decreased the total annual catch limit from 1,780,000 pounds whole weight to 1,720,000 pounds whole weight, set the commercial annual catch limit at 464,400 pounds whole weight and the commercial quota at 394,740 pounds whole weight, set the recreational annual catch limit at 1,255,600 pounds whole weight and the recreational quota at 1,092,372 pounds whole weight, reduced the commercial trip limit from 2,000 pounds whole weight to 1,500 pounds gutted weight, and increase the minimum recreational size limit from 30 inches fork length to 34 inches fork length.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 - Modifications to 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 (lbs) 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 is equivalent to 1.04 lbs ww using the standard conversion.

The current quota allocation for greater amberjack is 73% recreational and 27% commercial.

Alternative 1 (No Action): Maintain the current annual catch limit (ACL) and annual catch target (ACT; quota). Values are in pounds whole weight (ww). ABC was set at constant level recommended by the SSC for 2015+. 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.

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

Alternative 2: Set the ACL equal to the ABC recommended by the Scientific and Statistical Committee (SSC) from 2018 through 2020, based upon the SEDAR 33 Update Assessment (2017). This alternative is projected to rebuild the stock by 2027.

Option a. Retain the ACL/ACT Control Rule to obtain new buffers:
Commercial Buffer = 13%
Recreational Buffer = 17%

		Recreational		Commercial	
Year	ABC/ Stock ACL	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 an ACT.

		Recreational		Commercial	
Year	ABC/ Stock ACL	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 a constant ABC at the lowest 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 to obtain new buffers:
Commercial Buffer = 13%
Recreational Buffer = 17%

		Recreational		Commercial	
Year	ABC/ Stock ACL	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 an ACT.

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

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

Discussion: The 2017 Southeast Data, Assessment, and Review (SEDAR) workshops (SEDAR 33, Update) determined that the greater amberjack stock remains overfished and is experiencing overfishing as of 2015, the terminal year of data in the assessment. The status determination criteria used to make these determinations were established in Secretarial Amendment 2 (GMFMC 2003) and are defined as follows: maximum sustainable yield (MSY) is the yield associated with $F_{30\% SPR}$ (proxy for MSY) when the stock is at equilibrium; optimum yield is the yield associated with an $F_{40\% SPR}$ when the stock is at equilibrium; maximum fishing mortality threshold (MFMT) is equal to $F_{30\%SPR}$; and minimum stock size threshold is equal to (1-M)*$B_{MSY,}$ or 75% of biomass at maximum sustainable yield (B_{MSY}). Natural mortality (M) equals 0.25 for greater amberjack.

Action 1 includes alternatives to adjust the rebuilding time period, ABC, ACLs, and ACTs for greater amberjack based on the SEDAR 33 Update Assessment (2017) and subsequent Scientific

and Statistical Committee (SSC) review including recommendations for the ABC. The 2015 Framework Amendment (GMFMC 2015) established a stock ABC of 1,720,000 pounds whole weight (lbs), which exceeds the current SSC recommendation for ABC of 1,182,000 lbs for 2018.

Greater amberjack are currently managed toward harvesting the ACT (i.e., quota). This strategy provides a management buffer between the ACT and ACL, ultimately reducing the likelihood of exceeding the ACL and triggering AMs. The Gulf of Mexico Fishery Management Council (Council) established an ACL/ACT control rule in the Generic ACL/AM Amendment (GMFMC 2011). The Council developed the ACL/ACT control rule so it could objectively and efficiently assign catch limits and targets that take into account management uncertainty. 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 stock ACL will remain at 1,720,000 lbs. The commercial and recreational ACLs, ACTs, and ACL/ACT buffers would also remain the same.

Alternative 2 would set the stock ACL equal to the ABC recommended by the SSC from 2018 through 2020 and is projected rebuild the stock (i.e., SSB to SPR 30%) by 2027. **Alternative 2** would also establish a new stock ACL of 1,182,000 lbs. This would be 538,000 lbs less than the current stock ACL (1,720,000 lbs). The stock ACL would increase to 1,489,000 lbs in 2019, and 1,794,000 lbs in 2020 and years thereafter until a new ABC is developed. 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, **Alternative 2 Option a**, would use the updated ACL/ACT control rule through the 2016 landings and apply a 13% commercial buffer and a 17% recreational buffer to establish the ACT, or management target. **Alternative 2**, **Option b** does not set an ACT using the ACL/ACT Control Rule. Both the recreational and commercial sectors harvests have previously exceeded their respective ACLs and this would increase both the buffer and the likelihood of rebuilding the stock to target biomass levels by 2027.

Alternative 3, Option a would set the ABC at the lowest level recommended by the SSC from 2018-2020 based upon the SEDAR 33 Update Assessment (2017), and apply the new ACL/ACT Control Rule Buffer: Commercial Buffer = 13% and Recreational Buffer = 17%. **Alternative 3, Option b**, does not set an ACT using the ACL/ACT Control Rule. **Alternative 3** is projected to rebuild the stock by 2024.

Alternative 4 would set the stock ACL and commercial and recreational ACTs at zero is projected to rebuild the stock by 2022.

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