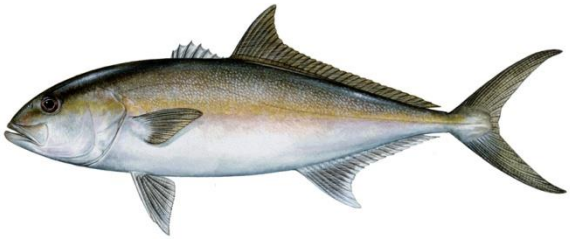
Modifications to the Greater Amberjack Catch Limits and Sector Allocation



Amendment 54
to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico

Including Environmental Assessment

August 2022

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ENVIRONMENTAL ASSESSMENT COVER SHEET

Modifications to the Greater Amberjack Catch Limits and Sector Allocation: Amendment 54 to the Fishery Management Plan for the Reef Fish Resources in the Gulf of Mexico including Environmental Assessment

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This Environmental Assessment is being prepared using the 2020 CEQ NEPA Regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020, and reviews begun after this date are required to apply the 2020 regulations unless there is a clear and fundamental conflict with an applicable statute. 85 Fed. Reg. at 43372-73 (§§ 1506.13, 1507.3(a)). This Environmental Assessment began in April 15, 2022 and accordingly proceeds under the 2020 regulations.

ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
AM	accountability measures
B	biomass
CHTS	Coastal Household Telephone Survey
Council	Gulf of Mexico Fishery Management Council
EA	environmental assessment
EIS	environmental impact statement
F	fishing mortality rate
FES	Fishing Effort Survey
FL	fork length
FMP	fishery management plan
Gulf	Gulf of Mexico
gw	gutted weight
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	maximum fishing mortality threshold
mp	million pounds
MRIP	Marine Recreational Information Program
MRFSS	Marine Recreational Fisheries Statistics Survey
MSST	minimum stock size threshold
NMFS	National Marine Fisheries Service
OFL	overfishing limit
Reef Fish FMP	Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico
RFA	regulatory flexibility analyses
RIR	regulatory impact review
SEDAR	Southeast Data, Assessment and Review
SEFSC	Southeast Fisheries Science Center
SPR	spawning potential ratio
SRHS	Southeast Region Headboat Survey
SSB	spawning stock biomass
SSC	Scientific and Statistical Committee
TAC	total allowable catch
ww	whole weight

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CHAPTER 1. INTRODUCTION

1.1 Background

Amendment 54 to the Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico (Reef Fish FMP) is being developed by the Gulf of Mexico Fishery Management Council (Council) to address the results of the Southeast Data Assessment and Review (SEDAR) 70 (2020) stock assessment and subsequent overfishing limit (OFL) and acceptable biological catch (ABC) recommendations from the Council's Scientific and Statistical Committee (SSC). Amendment 54 proposes to revise the Gulf of Mexico (Gulf) greater amberjack allocation between the recreational and commercial sectors and modify the OFL, ABC, annual catch limits (ACL), and annual catch targets (ACT).

In 2020, SEDAR 70 was completed and reviewed by the SSC. The stock assessment results and SSC indicated that greater amberjack is overfished and experiencing overfishing at its January 2021 meeting. Earlier stock assessments have also indicated that the stock is overfished and overfishing has continued despite the implementation of several management measures that have constrained catch and reduced the fishing mortality of juveniles (Table 1.1.1). The results of SEDAR 70 require modifications to greater amberjack catch limits in order to meet the 2027 rebuilding timeline put in place with a 2017 framework action (GMFMC 2017a). The revised catch limits specified in Amendment 54 are expected to immediately end overfishing and rebuild the stock by 2027.

Table 1.1.1. Summary of stock assessments, outcomes, and subsequent management actions for Gulf greater amberjack.

Stock Assessment	Stock Status	Management Action
Turner et al. 2000	Overfished and overfishing	Secretarial Amendment 2 (GMFMC 2002)
SEDAR 9 2006	Overfished and overfishing	Amendment 30A (GMFMC 2008)
SEDAR 9 Update 2011	Overfished and overfishing	Amendment 35 (2012)
SEDAR 33 2014	Overfished and overfishing	Framework Action (2015)
SEDAR 33 Update 2016	Overfished and overfishing	Framework Action (2017)
SEDAR 70 2020	Overfished and overfishing	Amendment 54 (in progress)

The first stock assessment for greater amberjack was completed by Turner et al. (2000) and determined the greater amberjack stock to be overfished and undergoing overfishing as of 1998. Secretarial Amendment 2 (GMFMC 2002) established a rebuilding plan for greater amberjack that was expected to rebuild the stock within 7 years (by the end of 2009). New management measures were implemented in January 1997 (GMFMC 1995) to reduce the recreational bag limit from three fish to one fish per person per day and in January 1998, a March through May fixed spawning season closure was established for the commercial sector (GMFMC 1997).

These management measures were expected to end overfishing, and thus no additional management measures were established in Secretarial Amendment 2.

In 2006, SEDAR 9 was completed and determined the greater amberjack stock was not recovering as previously projected. The stock continued to be overfished and was experiencing overfishing (SEDAR 9 2006). The Council developed Amendment 30A (GMFMC 2008) to end overfishing and rebuild the stock by 2010, consistent with the time frame of the original rebuilding plan implemented with Secretarial Amendment 2 (GMFMC 2002). A 40% reduction in fishing mortality was required to rebuild the stock as required by the rebuilding plan. In an effort to meet this rebuild target date, Amendment 30A established quotas to serve as the ACL for the recreational and commercial sectors and required sector-specific, in-season closure and postseason payback accountability measures (AM).

In 2010, SEDAR 9 Update was completed and reviewed by the SSC at its March 2011 meeting. The SSC agreed with the outcomes of the assessment, which concluded that the stock remained overfished and was continuing to experience overfishing (SEDAR 9 Update 2010). Although the SSC recommended that the SEDAR 9 Update assessment was the best scientific information available, it determined that the harvest projections resulting from this assessment were too sensitive to projection settings (e.g., minor changes to initial conditions, F, or catch levels produced widely divergent results) to be plausible and elected to accept the assessment in terms of the stock status determination but used tier 3b of the ACL control rule (GMFMC 2011) as the mechanism to determine the OFL and ABC.

Using Tier 3b, the SSC set the OFL for greater amberjack equal to the weight of the mean landings for the most recent ten years (2000 - 2009) and then set the ABC at 75% of that 10-year mean (i.e., 1,780,000 lbs whole weight [ww]).[1] Even though the SSC recommendations were based on landings during a time period when overfishing was occurring, the SSC determined that the magnitude of overfishing was unknown, but expected the ABC recommendation (i.e., 75% of the OFL) to reduce, and ultimately end overfishing.

In response, the Council developed Reef Fish Amendment 35 (GMFMC 2012), which reduced the greater amberjack stock OFL, ABC, and ACLs, and established sector ACTs that were used as management targets. The management measures implemented in Amendment 35 were expected to end overfishing; however, it could not be determined if the stock would meet its rebuilding schedule until a new benchmark assessment was completed.

In 2014, the SEDAR 33 benchmark stock assessment was completed and reviewed by the SSC at its June 2014 meeting. The SSC agreed with the outcomes of the assessment, which concluded that greater amberjack remained overfished, was experiencing overfishing as of 2012 (SEDAR 33 2014), and did not meet the rebuilding timeline set with Secretarial Amendment 2 (GMFMC 2002). The SSC recommended an OFL and ABC equivalent to 75% of MFMT starting in 2015, consistent with the National Standard (NS) 1 guidelines. In 2015, the Council developed a framework action, which was implemented in 2016, that increased the OFL, but further reduced the sector ACLs and ACTs in an effort to end overfishing (GMFMC 2015). With those changes, the stock was expected to rebuild by the end of 2019.

[1] http://gulfcouncil.org/resources/SSC_Reports.php

In 2016, the SEDAR 33 Update assessment was completed and reviewed by the SSC at its March 2017 meeting. The SSC agreed with the outcomes of the assessment, which concluded that greater amberjack was still overfished and undergoing overfishing as of 2015 and the stock would not be rebuilt by 2019 as previously projected. The results indicated that greater amberjack had been overfished in all years since 1987 and had been undergoing overfishing since 1985. While the results were generally consistent with the SEDAR 33 assessment, the update assessment produced lower estimates of spawning stock biomass and higher estimates of fishing mortality in the most recent years. The National Marine Fisheries Service (NMFS) notified that Council that the stock was not making adequate progress towards rebuilding and the Council developed a framework action to modify the rebuilding time and the catch levels. The framework action, which was implemented in 2017, reduced the OFL and sector ACLs and ACTs in an effort to end overfishing and rebuild the stock by 2027 (GMFMC 2017a).

SEDAR 70 (2020) Stock Assessment

In 2020, SEDAR 70 was completed and reviewed by the Council's SSC at its January 2021 meeting. The SSC agreed with the outcomes of the assessment, which concluded that Gulf greater amberjack was overfished and experiencing overfishing (Table 1.1.2). The results also indicated that the greater amberjack stock has been overfished and undergoing overfishing almost continuously since 1980. The Council discussed this outcome at its January 2021 meeting and directed staff to begin work on a plan amendment to revise the greater amberjack catch limits to immediately end overfishing and meet the 2027 rebuilding timeline.

Table 1.1.2. The Gulf greater amberjack management advice table (SEDAR 70 2020) as reviewed at the November 2021 SSC meeting. The stock is undergoing overfishing (Fcurrent/MFMT = 1.25) and is overfished (SSBcurrent/MSST = 0.83) as noted in gray below.

Criteria	Definitions	SEDAR 70	SEDAR 33 Update
M		0.28	0.28
Steepness		0.777	0.85
Virgin Recruitment	1,000s	3,698	2,761
SSB Unfished		23,733	18,779
	Mortality rate criteria		
F_{MSY} or proxy	$F_{SPR30\%}$	0.242	0.20
MFMT	$F_{SPR30\%}$	0.242	0.20
$F_{CURRENT}$	0.75*Directed F at $F_{30\%SPR}$	0.302	0.33
$F_{CURRENT}$/MFMT	Current stock status based on F_{MSY} proxy and MFMT	1.25	1.69
	Biomass criteria		
SSB_{MSY} or proxy	Equilibrium $F_{SPR30\%}$	5,838	5,686
MSST (Mtons)	0.5* $SSB_{SPR30\%}$	2,919	4,094[2]
$SSB_{CURRENT}$ (Mtons)	SSB_{2018}	2,433	1,640
$SSB_{CURRENT}$/$SSB_{SPR30\%}$	Current stock status based on $SSB_{SPR30\%}$ (Equilibrium)	0.42	0.288
$SSB_{CURRENT}$/MSST	Current stock status based on $MSST_{SPR30\%}$	0.83	0.400
$SSB_{CURRENT}$/SSB unfished	Current stock status based on $MSST_{SPR30\%}$	0.10	0.09

The Council also discussed the implications of the change from the Marine Recreational Information Program (MRIP) Coastal Household Telephone Survey (CHTS) to the Fishing Effort Survey (FES)-adjusted recreational landings estimates on allocation and catch limits. Reef Fish Amendment 30A (GMFMC 2008) used Marine Recreational Fisheries Statistics Survey (MRFSS) landings estimates for the recreational sector in determining the sector allocations and catch levels. The use of MRIP-FES data in stock assessments has two primary effects on the results of the SEDAR 70 greater amberjack stock assessment and subsequent management actions. First, the MRIP-FES estimates of historical recreational effort and catch are substantially greater than previous assessments. The use of MRIP-FES recreational data leads to higher estimates of historical removals for this stock. Second, the proportion of landings from the recreational sector is higher than previously thought when the allocation was established in Amendment 30A (GMFMC 2008). Table 1.1.3 provides recreational landings in MRIP-CHTS and MRIP-FES, commercial landings, and total landings for greater amberjack.

[2] MSST = (1-M)* SSBSPR30%

Table 1.1.3. Commercial and recreational landings (MRIP-CHTS and MRIP-FES) of greater amberjack for calendar years 1981-2019. Units in pounds whole weight.

	Commercial	Recreational MRIP-CHTS	Recreational MRIP-FES	Total (Comm + CHTS)	Total (Comm + FES)
1981	232,739	547,621	1,535,588	780,360	1,768,327
1982	221,683	5,665,086	14,249,538	5,886,769	14,471,221
1983	276,074	3,351,993	8,744,054	3,628,067	9,020,128
1984	523,645	1,496,948	1,933,531	2,020,593	2,457,176
1985	761,646	2,652,312	5,788,808	3,413,958	6,550,454
1986	1,129,479	5,797,352	7,741,413	6,926,831	8,870,892
1987	1,561,381	7,011,335	18,301,807	8,572,716	19,863,188
1988	2,077,356	2,746,488	3,267,167	4,823,844	5,344,523
1989	1,968,751	6,108,206	8,948,748	8,076,957	10,917,499
1990	1,264,664	833,285	1,417,110	2,097,949	2,681,774
1991	1,782,934	4,342,851	6,030,388	6,125,785	7,813,322
1992	1,062,769	4,723,367	11,920,679	5,786,136	12,983,448
1993	1,623,943	3,189,067	4,857,808	4,813,010	6,481,751
1994	1,287,402	2,287,572	3,364,206	3,574,974	4,651,608
1995	1,243,250	806,492	1,109,144	2,049,742	2,352,394
1996	1,246,440	1,556,020	2,623,428	2,802,460	3,869,868
1997	1,069,462	1,371,608	2,211,032	2,441,070	3,280,494
1998	655,805	933,853	1,901,048	1,589,658	2,556,853
1999	728,441	1,046,405	2,540,025	1,774,846	3,268,466
2000	850,537	1,402,255	2,369,875	2,252,792	3,220,412
2001	706,405	1,610,989	2,270,655	2,317,394	2,977,060
2002	768,941	2,434,464	4,339,407	3,203,405	5,108,348
2003	960,552	3,529,823	6,463,326	4,490,375	7,423,878
2004	951,048	2,975,994	6,671,435	3,927,042	7,622,483
2005	717,170	1,474,028	3,262,366	2,191,198	3,979,536
2006	591,947	1,828,066	3,034,526	2,420,013	3,626,473
2007	587,865	887,267	1,287,113	1,475,132	1,874,978
2008	468,859	1,319,955	2,561,504	1,788,814	3,030,363
2009	594,833	1,604,289	2,482,621	2,199,122	3,077,454
2010	554,510	1,268,182	2,992,744	1,822,692	3,547,254
2011	519,564	943,476	2,082,231	1,463,040	2,601,795
2012	315,165	1,301,684	2,987,024	1,616,849	3,302,189
2013	471,301	1,642,863	3,217,306	2,114,164	3,688,607
2014	532,032	1,303,657	2,327,463	1,835,689	2,859,495
2015	500,613	1,933,746	2,618,841	2,434,359	3,119,454
2016	478,545	1,567,866	2,353,695	2,046,411	2,832,240
2017	484,024	624,941	1,011,487	1,108,965	1,495,511
2018	325,545	1,494,129	2,508,766	1,819,674	2,834,311
2019	356,840	468,121	687,758	824,961	1,044,598

Source: Recreational landings April 2021 MRIP_FES_rec81_20wv6_02Mar21w2014to2020LAcreel.xlsx. MRIP-CHTS: MRIPACLspec_rec81_20wv6_02Mar21w2014_2020LAcreel.xlsx. Commercial landings from SEDAR 70 (2020) for 1981-2018 and ACL dataset WH_ACLs_2014-2020_05APR2021workingcopy.xlsx for 2019.

Due to the change in recreational data units from MRIP-CHTS to MRIP-FES used in the stock assessment and to monitor landings, the Council also directed staff to include an action to review the sector allocations and establish catch levels for each sector allocation option.[3] The Council directed staff to develop potential options for allocations that reflect the historical participation of each sector over representative time series. The annual MRIP-FES calibrated recreational data from the Southeast Fisheries Science Center (SEFSC) ACL monitoring dataset was then obtained, and the proportion of total landings harvested by each sector over the reference period for each option was calculated. For the commercial sector, data were provided from the SEDAR 70 stock assessment as these data correct landings prior to 1993 that were not reported to species. Since 1993, landings protocols require species specific identification for greater amberjack and thus few differences occur between the SEDAR 70 data and the dealer reported landings that are used for ACL monitoring since 1993. Based on these calculations the Council requested updated projections from the SEFSC for the following time series-based allocation scenarios.

- Using the years 1981-2004; 84% recreational: 16% commercial[4]
- Using the years 1993-2007; 78% recreational: 22% commercial[5]
- Using the years 1993-2019; 80% recreational: 20% commercial[6]

The Council also requested two additional allocation scenarios:

- Maintain the current 73% recreational and 27% commercial allocation
- Maintain the commercial annual catch limit fixed at 484,380 lbs ww (GMFMC 2017a), calculate the sector allocation (24.4% recreational, 75.6% commercial), then calculate OFL, ABC, and sector ACLs thereafter based on the calculated sector allocation. At its June 2022 meeting, the Council voted to move this alternative to considered but rejected.

While completing this Council request, the SEFSC introduced a new approach to generate projections for greater amberjack that incorporated technical improvements in forecasting software to produce harvest advice with a range of corresponding OFLs and ABCs. The approach was developed to streamline future Council requests for allocation scenarios after receiving the final stock assessment report. The new method used an iterative approach that is able simultaneously achieve multiple management targets, (e.g., Achieve desired fishing mortality while maintaining specified sector allocations)) using Stock Synthesis (SS) software. This method provides catch advice, but also re-estimates the model parameters and including biomass and fishing mortality estimates used to determine stock status in the base model as part of the projections. Historically, the SEFSC has not modified the base model after completion of the SEDAR process for a given stock. In this case, the SEFSC's revised projection method

[3] Selectivity including average size/age of capture and discard rates varies between the recreational and commercial fishing fleet and this affects the total OFL and ABC for the stock. Therefore, the allocation selected affects the OFL and ABC and varies for each allocation option being considered.
[4] This is time series that the current allocation is based on.
[5] Prior to 1993, commercial landings of jacks were combined and thus, commercial greater amberjack landings may be imprecise.
[6] This option removes consideration of data prior to 1993 given concerns about the commercial data and extends the time series to reflect a longer and more recent basis determining allocation.

changed the management benchmarks generated by the previously reviewed base model at the January 2021 SSC meeting. Because this change in the management benchmarks is in effect a change to the base model outside of the SEDAR process, the SEDAR 70 base model, including this new projection method, the SSC determined that additional review was necessary prior to making OFL and ABC recommendations.

At the September 2021 SSC meeting,[7] SEFSC staff reviewed the new projection methodology used for greater amberjack including a decision tree to determine projection settings while noting that changes to recruitment estimates and biomass targets were updated from the original results presented at the January 2021 meeting and this change can influence the stock status determination (i.e., overfished and/or overfishing). The SSC determined that it was more appropriate to base future harvest off the recent recruitment rates as opposed to the average recruitment over the entire management period because there is evidence of a regime shift to a period of lower recruitment beginning in 1990. Based on this review, the SSC determined that the projections protocols were appropriate and requested the sector allocation specific projections be presented at the November 2021 SSC meeting.

The SEFSC provided updated projections in November 2021 to the SSC. Based on these projections, the SSC affirmed its prior determination that greater amberjack is overfished and experiencing overfishing. The SSC provided updated OFL, ABC, and rebuilding projections at based on the allocation scenarios that were reviewed by the Council at its January 2022 meeting. The Council reviewed more detailed alternative catch level projections in April 2022. These allocation scenarios, collectively, resulted in OFL values that differed by 5% or less. Had MRIP-FES data been available for SEDAR 33 Update in 2016, the current total stock ACL recommendations would represent approximately a 65% - 79%[8] decrease in yield, depending on year and allocation scenario, from SEDAR 33 Update.

[7] https://gulfcouncil.org/wp-content/uploads/Gulf-SSC-Summary-Sept-2021-10192021.pdf
[8] Based on the yield stream from 2023 through 2027.

Sector Allocation

Reef Fish Amendment 30A (GMFMC 2008) established quotas and allocated the greater amberjack stock between the recreational and commercial sectors. During development of the amendment, the Council initially decided to establish a sector allocation based on the long-term average landings from the recreational and commercial sectors from 1981 through 2004. However, the Council was not comfortable moving forward with the resulting allocation of 71% recreational and 29% commercial. During deliberations, the Council noted that the early years of the time series were primarily recreational landings (84% of landings from 1981 -1987; GMFMC 2008) while the most recent years in the allocation time series (2001-2004) had increasing landings by the commercial sector (32% of landings from 2001-2004; GMFMC 2008). Ultimately, the Council agreed to an interim allocation that reassigned 2% of the commercial allocation to the recreational sector and established a sector allocation of 73% recreational and 27% commercial.

Action 1 considers modifications to the allocation that would result from the integration of MRIP-FES data that were used in the stock assessment. The MRIP-FES recreational data provide landings estimates that are greater than those estimated with MRIP-CHTS data, thereby changing the proportion of historical landings made by the recreational sector. That is, the incorporation of MRIP-FES recreational data into the stock assessment and management reflects the greater contribution to historical effort and landings by the recreational sector and a larger percentage of the total landings than was recognized when the allocation in Amendment 30A was determined.

Management Measures

Table 1.1.4 summarizes the recreational and commercial management measures for the harvest of greater amberjack. The fishing year for commercial greater amberjack is January 1 – December 31 with a fixed-closed season from March 1 – May 31 (GMFMC 1981 and 1997). The fishing year for recreational greater amberjack is August 1 – July 31 with fixed closed seasons from November 1 – April 30 and June 1 – July 31 (GMFMC 2017b). The minimum size limits for greater amberjack are a 36-inch fork length (FL) for the commercial sector (GMFMC 1989), and 34-inch FL for the recreational sector (GMFMC 2015). The commercial trip limit is 1,000 lbs gutted weight (gw) with a step down to 250 lbs gw when 75% of the ACT has been harvested (GMFMC 2019). The recreational bag limit is one fish per person per day (GMFMC 1995).

Table 1.1.4. Recreational and commercial management measures for the harvest of greater amberjack.

	Recreational	Commercial
Fishing Year	Aug 1 – July 31	Jan 1 – Dec 31
Fixed Closed Season(s)	Nov 1 – Apr 30 and June 1 – July 31[9]	Mar 1 – May 31
Minimum Size Limit	34-inch FL	36-inch FL
Bag/Trip Limit	1 fish per person per day	1,000 lbs gw until 75% of ACT is reached, then 250 lbs gw

Currently, the commercial and recreational sectors have ACTs set at 13% and 17% below their respective ACLs (GMFMC 2017a). When either sector's landings reach or are projected to reach its ACT, that sector is closed to harvest for the remainder of its fishing year. If either sector's landings exceed its ACL, then in the following fishing year, a post-season AM overage adjustment (also called a payback) is applied that reduces that sector's ACL by the amount of the overage and adjusts the ACT accordingly (GMFMC 2008). An in-season closure is then projected based on when the reduced ACT will be met.

Overage adjustments resulting from these AMs have occurred for both the recreational and commercial sectors in recent years, and the reduced catch limits have contributed to the shortened fishing seasons. Figure 1.1.1 shows the commercial and recreational sector landings alongside the length of the fishing season for each sector beginning in 1990 when greater amberjack was added to the fishery management unit through Amendment 1 (GMFMC 1989). Recreational harvest estimates are presented in the MRIP-CHTS data currency.

[9] An emergency rule, effective July 25, 2022, modified the recreational fixed closed season to be August 1 – 31, 2022 and November 1, 2022 through July 31, 2023. At the end of the emergency rule time period, or implementation of Reef Fish Amendment 54, whichever comes first, the recreational fixed closed season will revert back to what is presented in Table 1.1.4.

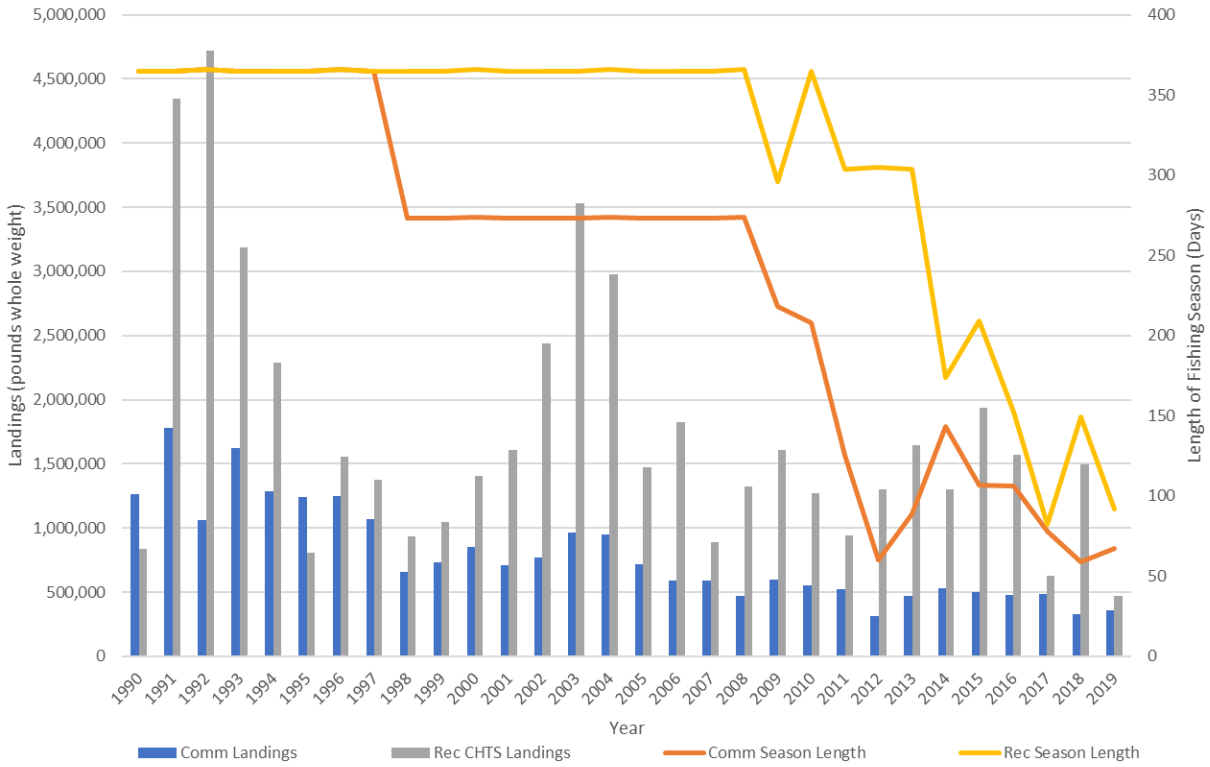

Figure 1.1.1. Commercial and recreational landings (blue and gray bars; left y-axis) and length of fishing season in days (orange and yellow lines; right y-axis) for 1990-2019. Recreational landings are in MRIP-CHTS units.

1.2 Purpose and Need

The purpose of this action is to modify the rebuilding plan and associated catch levels necessary to end overfishing, rebuild the Gulf greater amberjack stock by 2027, and to modify the greater amberjack allocation between the commercial and recreational sectors using the best scientific information available based on the results from the SEDAR 70 stock assessment and subsequent OFL and ABC recommendations from the SSC.

The need is to end overfishing and rebuild the greater amberjack stock as required by the Magnuson-Stevens Fishery Conservation and Management Act, update existing greater amberjack catch limits and allocations to be consistent with best scientific information available, FMP objectives, and contemporary data collection methods.

1.3 History of Management

The **Reef Fish FMP** (with environmental impact statement [EIS]) was implemented in November 1984 and set a calendar fishing year for those species in the FMP. The original list of species included in the management unit consisted of snappers, groupers, and sea basses. *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. This history of management covers actions pertinent to the harvest of Gulf greater amberjack. A complete history of management for the Reef Fish Fishery Management Plan (Reef Fish FMP) is available on the Council's website.[10]

Amendment 1 (with environmental assessment [EA], regulatory impact review [RIR], and regulatory flexibility analyses [RFA]) 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.

Amendment 12 (with EA, RIR, and RFA), 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, and almaco jack).

Amendment 15 (with EA, RIR, and RFA), implemented in 1998, established a fixed closed season for the commercial harvest of greater amberjack in the Gulf during the months of March, April, and May.

Generic Sustainable Fisheries Act Amendment (with EA), partially approved and implemented in 1999, set the maximum fishing mortality threshold (MFMT) for greater amberjack at the fishing mortality necessary to achieve 30% of the unfished spawning potential ratio (SPR) F30% SPR.

Secretarial Amendment 2 (with EA, RIR, and RFA), implemented in 2003, specified maximum sustainable yield (MSY) for greater amberjack as the yield associated with $F_{30\% SPR}$ (proxy for fishing mortality rate corresponding to an equilibrium yield of MSY [F_{MSY}]) when the stock is at equilibrium, optimum yield as the yield associated with an $F_{40\% SPR}$ when the stock is at equilibrium, MFMT equal to $F_{30\%SPR}$, and minimum stock size threshold (MSST) equal to (1-M)*B_{MSY} (where M = natural mortality and B_{MSY} = stock biomass level capable of producing an equilibrium yield of MSY) or 75% of B_{MSY}. It also set a rebuilding plan expected to rebuild the stock in 7 years (by 2009). Regulations implemented in 1997 and 1998 (Amendments 12 and 15) were deemed sufficient to comply with the rebuilding plan so no new regulations were implemented.

Amendment 30A (with EIS, RIR, and RFA), implemented in 2008, was developed to stop overfishing of greater amberjack. The amendment established ACLs and AMs for greater amberjack. The rebuilding plan was modified to be rebuilt by 2012, the recreational minimum size limit was increased to 30 inches FL, and a zero bag limit was implemented for captain and crew of for-hire vessels. **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

[10] http://www.gulfcouncil.org/fishery_management_plans/reef_fish_management.php

implement a separate amendment that fairly and equitably allocated Reef Fish FMP resources between recreational and commercial sectors.

A Regulatory Amendment (with EA, RIR, and RFA), implemented in 2011, specified the greater amberjack recreational fixed closed season during the months of June and July. 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, RIR, and RFA), implemented in 2012 in response to a 2010 update stock assessment, modified the greater amberjack rebuilding plan and established a reduced the total stock ACL and set it equal to the ABC. 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 and set commercial and recreational ACTs.

2015 Framework Action (with EA, RIR, and RFA), implemented in 2016 created a new rebuilding plan (stock rebuilt by 2019), reduced the total stock ACL, reduced the commercial trip limit from 2,000 lbs ww to 1,500 lbs gw, and increased the recreational minimum size limit from 30 inches FL to 34 inches FL.

Amendment 44 (with EA), was implemented in December 21, 2017. This amendment changed the MSST for seven species in the Reef Fish FMP, including greater amberjack. After the approval of Amendment 44, the greater amberjack stock was still classified as overfished and undergoing overfishing.

The Council approved two framework actions in 2017 that addressed management of Gulf greater amberjack. **Modifications to Greater Amberjack Allowable Harvest and Rebuilding Plan** (with EA, RIR, and RFA), implemented on January 27, 2018 modified the rebuilding time period to end in 2027 and set the sector-specific ACLs and ACTs for 2018 to 2020 and beyond. In addition, this framework action modified the fixed season closure for the recreational sector to be January 1 through June 30 each year.

Modifications to the Greater Amberjack Fishing Year and the Recreational Fixed Closed Season (with EA, RIR, and RFA), implemented on April 20, 2018 modified the recreational fishing year to begin on August 1 and run through July 31 of the following year. It also modified the fixed closed season so that recreational harvest is prohibited from November 1 – April 30 and June 1 – July 31. The framework was implemented on April 30, 2018.

2019 Framework Action (with EA, RIR, and RFA), implemented in 2020 reduced the commercial trip limit from 1,500 lbs gw to 1,000 lbs gw with a step down to 250 lbs gw when 75% of the commercial ACL was harvested.

2022 Emergency Rule modified the recreational fixed closed season to be August 1 – 31, 2022 and November 1, 2022 through July 31, 2023. The rule became effective July 25, 2022.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 – Modify the Gulf of Mexico Greater Amberjack Sector Allocations, Overfishing Limit (OFL), Acceptable Biological Catch (ABC), and Annual Catch Limits (ACL)

Alternative 1: No Action – Maintain the sector allocations of the total stock ACL for greater amberjack between the recreational and commercial sectors. The allocations for greater amberjack are 73% recreational and 27% commercial. The allocation was derived from the average landings using Marine Recreational Fisheries Statistics Survey (MRFSS) data from the years 1981 through 2004, established in Reef Fish Amendment 30A. Maintain the current OFL, ABC, and ACLs. The recreational sector ACL is in Marine Recreational Information Program (MRIP) Coastal Household Telephone Survey (CHTS) units.

Year	OFL	ABC	Total ACL	Rec ACL	Com ACL	Allocation (Rec:Com)
2020+	2,167,000	1,794,000	1,794,000	1,309,620	484,380	73:27

Note: Catch limits in pounds whole weight. The recreational portion of the 2020+ OFL, ABC, total ACL are based on MRIP-CHTS data. The recreational portion of the MRIP Fishing Effort Survey (FES) equivalent is provided for comparison only. There is not an equivalent MRIP-FES commercial ACL since the effort estimation for the commercial sector is unchanged.

Alternative 2: Maintain the sector allocations as 73% recreational and 27% commercial. Revise the OFL and ABC as recommended by the Scientific and Statistical Committee (SSC) based on SEDAR 70 (2020). Set the total stock ACL equal to the ABC.

Year	OFL	ABC	Total ACL	Rec ACL	Com ACL	Allocation (Rec:Com)
2022	2,102,000	521,000	521,000	380,330	140,670	73:27
2023	2,236,000	649,000	649,000	473,770	175,230	73:27
2024	2,343,000	770,000	770,000	562,100	207,900	73:27
2025	2,419,000	875,000	875,000	638,750	236,250	73:27
2026	2,472,000	964,000	964,000	703,720	260,280	73:27
2027	2,507,000	1,035,000	1,035,000	755,550	279,450	73:27

Note: Values are in pounds whole weight. The recreational portion of the OFL, ABC, total ACL and ACL are based on MRIP-FES data.

Alternative 3: Revise the allocation between the recreational and commercial sectors using MRIP-FES adjusted average landings during the years 1981 through 2004. The allocations for

greater amberjack are 84% recreational and 16% commercial. Revise the OFL and ABC as recommended by the SSC based on SEDAR 70 (2020). Set the total stock ACL equal to the ABC.

Year	OFL	ABC	Total ACL	Rec ACL	Com ACL	Allocation (Rec:Com)
2022	1,996,000	497,000	497,000	417,480	79,520	84:16
2023	2,130,000	621,000	621,000	521,640	99,360	84:16
2024	2,234,000	739,000	739,000	620,60	118,240	84:16
2025	2,305,000	842,000	842,000	707,280	134,720	84:16
2026	2,354,000	929,000	929,000	780,360	148,640	84:16
2027	2,387,000	999,000	999,000	839,160	159,840	84:16

Note: Values are in pounds whole weight. The recreational portion of the OFL, ABC, total ACL and ACL are based on MRIP-FES data.

Alternative 4: Revise the allocation between the recreational and commercial sectors using MRIP-FES adjusted average landings during the years 1993 through 2007. The allocations for greater amberjack are 78% recreational and 22% commercial. Revise the OFL and ABC as recommended by the SSC based on SEDAR 70 (2020). Set the total stock ACL equal to the ABC.

Year	OFL	ABC	Total ACL	Rec ACL	Com ACL	Allocation (Rec:Com)
2022	2,052,000	509,000	509,000	397,020	111,980	78:22
2023	2,186,000	636,000	636,000	496,080	139,920	78:22
2024	2,292,000	756,000	756,000	589,680	166,320	78:22
2025	2,365,000	860,000	860,000	670,800	189,200	78:22
2026	2,417,000	947,000	947,000	738,660	208,340	78:22
2027	2,451,000	1,018,000	1,018,000	794,040	223,960	78:22

Note: Values are in pounds whole weight. The recreational portion of the OFL, ABC, total ACL and ACL are based on MRIP-FES data.

Alternative 5: Revise the allocation between the recreational and commercial sectors using MRIP-FES adjusted average landings during the years 1993 through 2019. The allocations for greater amberjack are 80% recreational and 20% commercial. Revise the OFL and ABC as recommended by the SSC based on SEDAR 70 (2020). Set the total stock ACL equal to the ABC.

Year	OFL	ABC	Total ACL	Rec ACL	Com ACL	Allocation (Rec:Com)
2022	2,033,000	505,000	505,000	404,000	101,000	80:20
2023	2,167,000	631,000	631,000	504,800	126,200	80:20
2024	2,272,000	750,000	750,000	600,000	150,000	80:20
2025	2,345,000	854,000	854,000	683,200	170,800	80:20
2026	2,395,000	941,000	941,000	752,800	188,200	80:20
2027	2,429,000	1,012,000	1,012,000	809,600	202,400	80:20

Note: Values are in pounds whole weight. The recreational portion of the OFL, ABC, total ACL and ACL are based on MRIP-FES data.

Discussion

In 2020, SEDAR 70 was completed and reviewed by the SSC at multiple meetings in 2021. The SEDAR 70 assessment was completed to determine if the greater amberjack stock was rebuilding as expected and to incorporate the revised recreational data landings estimates using data from MRIP-FES. The use of MRIP-FES data changed the understanding of the magnitude of historical catch and the relative rates of participation from the recreational and commercial sectors. At its November 2021 meeting, the SSC accepted the greater amberjack assessment as the best scientific information available and concluded that greater amberjack remains overfished and is experiencing overfishing. The SSC made recommendations of OFL and ABC noting that the change in recreational data currency from the MRIP-CHTS to MRIP-FES affects estimates of historical landings and stock productivity. As such, the new catch level recommendations are not directly comparable to those in previous assessments or related management actions. However, the new recommendations do represent substantial decreases in the ABC, as necessary to end overfishing and rebuild the stock by 2027, in accordance with the current rebuilding plan (GMFMC 2017a).

Alternative 1 (No Action) retains the existing allocation that was established in Reef Fish Amendment 30A (GMFMC 2008). **Alternative 1** also retains the existing OFL and ABC, which are based on the previous Gulf greater amberjack stock assessment (SEDAR 33 Update 2016). The total stock ACL is equal to the ABC, as last specified in a 2017 Framework (GMFMC 2017a). The OFL, ABC and total stock ACL in **Alternative 1** are based, in part, on MRIP-CHTS data. One of the major changes between the SEDAR 33 Update (2016) and SEDAR 70 (2020) base models is the incorporation of the MRIP-FES adjustments to the recreational catch and effort estimates, which are considered by the National Marine Fisheries Service to be is the best scientific information available. Therefore, it would not be consistent with National Standard 2 of the Magnuson-Stevens Fishery Conservation and Management Act to retain the OFL, ABC and total stock ACL under **Alternative 1**, which are based on MRIP-CHTS data. The catch limits in **Alternative 1** also do not reflect the outcomes of SEDAR 70 and the SSC's OFL and ABC recommendations. To facilitate comparison with the action alternatives, the SEFSC completed an analysis[11] using the MRIP-FES recreational data in the SEDAR 33 Update assessment and developed projections of the current OFL and ABC in MRIP-FES units. This analysis resulted in an OFL (3.48 mp ww), ABC/total ACL (2.93 mp ww) and provides a basis for comparison for the change in catch levels attributed to the use of MRIP-FES alone (i.e., MRIP-FES total ACL [2.93 mp ww] in comparison to the MRIP-CHTS total ACL [1.794 mp ww]) and can be used to evaluate the change in allowable harvest between **Alternative 1** and **Alternatives 2-5**.

Alternatives 2-5 would modify the catch limits for Gulf greater amberjack based on the outcomes of SEDAR 70 and the Council's SSC catch level recommendations for 2022 through 2027. For each of these alternatives, the OFL is based on the maximum sustainable yield proxy (yield at $F_{30\%SPR}$) and ABC was established at the yield (mp ww) when fishing at $F_{Rebuild}$[12] through the end of the rebuilding period (2027). For all alternatives, the total stock ACL is equal to the ABC.

[11] https://gulfcouncil.org/wp-content/uploads/20a.-GAJ_S33Update_FES_projections.pdf
[12] F that would rebuild the stock to the level that supports MSY, $SSB_{SPR\ 30\%}$ in 2027 (SEDAR 70).

The total stock ACL in **Alternatives 2-5** is apportioned between the respective sectors based on the allocation considered in each alternative. For any particular alternative, the sum of the sector ACLs is equal to the total stock ACL. The reduction in the ABC under each of the action alternatives in comparison to **Alternative 1** occurs because the stock is overfished and is experiencing overfishing. The ABC is based on the fishing mortality reductions necessary to immediately end overfishing and rebuild the stock by 2027. The total stock ACL in **Alternatives 2-5** increases each year from 2022 to 2027 as the stock rebuilds. The total stock ACL changes modestly with allocation alternatives because of differing fishery characteristics (e.g., size harvested, discard rate, discard mortality) between the sectors.

Alternative 2 would maintain the allocation of Gulf greater amberjack established in Amendment 30A, of 73% recreational and 27% commercial. However, **Alternative 2** would revise the OFL and ABC based on SEDAR 70 and SSC recommendations. Under **Alternative 2**, the reduction in the total stock ACL would be approximately 82% relative to **Alternative 1**'s MRIP-FES equivalent total stock ACL in 2022 only. In **Alternative 2,** the total ACL increases each year and thus, the percent reduction in comparison to **Alternative 1** decreases as the stock rebuilds. This same pattern occurs for **Alternatives 3-5**. **Alternative 2** maintains the status quo allocation, but would address changes in allowable harvest necessary to immediately end overfishing and rebuild the stock by 2027. However, the recreational data used in establishing the allocation underestimated the historical landings and effort from the recreational sector and thus, does not reflect the nature of the fleets harvesting Gulf greater amberjack during the reference period using MRIP-FES.

Alternative 3 would modify the recreational and commercial sector allocations of Gulf greater amberjack based on landings from the same timeframe used in Amendment 30A (GMFMC 2008), 1981 through 2004, but using MRIP-FES landings, which is considered the best scientific information available. The resulting allocations are 84% recreational and 16% commercial. Under **Alternative 3**, the reduction in the total stock ACL in 2022 would be approximately 83% relative to **Alternative 1** and approximately 1% lower than the total stock ACL for **Alternative 2** in 2022. Similar to **Alternative 2**, the total stock ACL increases each year during the projection period. With respect to determining allocation, **Alternative 3** maintains the same reference period as **Alternatives 1** and **2** but increases the recreational allocation to 84% of the total stock ACL to reflect the additional recreational effort and landings that NMFS estimates occurred during this period as reflected in the MRIP-FES data. **Alternative 3** represents the largest allocation to the recreational sector of the alternatives considered in this action.

Alternative 4 would modify the recreational and commercial sector allocations of Gulf greater amberjack based on landings from 1993 through 2007. Commercial greater amberjack landings were not identified to species prior to 1993. Thus, the greater amberjack commercial landings may be less accurate prior to 1993. The reference period would end in 2007 because this is the last year prior to the implementation of the current sector allocations and in-season, and post-season accountability measures in Reef Fish Amendment 30A (GMFMC 2008). The resulting allocations are 78% recreational and 22% commercial. Under **Alternative 4**, the reduction in the total stock ACL would be approximately 83% relative to **Alternative 1** in MRIP-FES units in 2022 only. The total stock ACL under **Alternative 4** is similar to the total stock ACL under both **Alternatives 2** and **3**.

Alternative 5 would modify the commercial and recreational allocations of Gulf greater amberjack-based landings from the timeframe 1993 through 2019. Similar to **Alternative 4,** this reference period begins in 1993, a period after which the commercial data are considered more accurate. However, this alternative also includes years from 2008-2019, in which the sector allocations were in place and would influence the observed landings. In addition, because the *Deepwater Horizon* MC252 oil spill began in April 2010 and resulted in extensive fishery closures landings from 2010 should be viewed with caution. For **Alternative 5**, the resulting allocations are 80% recreational and 20% commercial. Under **Alternative 5**, the reduction in the total stock ACL would be approximately 83% relative to **Alternative 1** in MRIP-FES units in 2022 only. The total stock ACL under **Alternative 5** is similar to the total stock ACL under **Alternatives 2-4**.

2.2 Action 2 – Modify the Gulf of Mexico Greater Amberjack Sector Annual Catch Targets (ACT) Based on the Catch Limits and Allocation Selected in Action 1

Alternative 1: No Action – Maintain the current buffer between the ACL and ACT for each sector. The recreational buffer is 17% and the commercial buffer is 13%.

Alternative 2: Apply the ACL/ACT Control Rule (years 2017-2020) to revise the buffer between the ACL and ACT for each sector. The recreational buffer is 13%, and the commercial buffer is 7%.

Alternative 3: Apply the ACL/ACT Control Rule (years 2016-2019) to revise the buffer between the ACL and ACT for each sector. The recreational buffer is 17%, and the commercial buffer is 7%.

Discussion:

Alternatives in Action 2 apply to the ACT buffers for the greater amberjack commercial and recreational sectors. The resulting ACTs for each sector in Action 2 are determined based on the sector ACLs and allocations selected in Action 1 and the ACT buffer selected in Action 2.

The Council will likely continue to use ACTs to address management uncertainty and the post-season accountability measures (AM) will remain in place to correct for any ACL overages. AMs for both sectors project in-season closures to harvest the ACT. A 2017 Reef Fish Framework Action established buffers between the ACL and ACT using the Gulf ACL/ACT Control Rule, which resulted in buffers of 17% for the recreational sector and 13% for the commercial sector (**Alternative 1**). The ACL/ACT Control Rule took into consideration for each sector the number of times the ACL was exceeded, the precision of recreational landings based on proportional standard error, the precision of commercial landings, in-season AMs in place, and the stock status for years (2013-2016). These same factors were taken into consideration for **Alternative 2** (2017-2020) and **Alternative 3** (2016-2019) with different time series being used to determine the buffers.

Alternative 2 uses the most recent time series of available landings (2017-2020) for the ACL/ACT Control Rule to calculate the ACT buffers. This results in buffers of 13% for the recreational sector and 7% for the commercial sector (Appendix B and C). This is a reduction from the current buffers of 17% for the recreational sector and 13% for the commercial sector and are due in part to a more recent time series being used in the ACL/ACT control rule. However, using 2020 landings may not be representative of normal fishing practices due to the onset of COVID-19 that resulted in changes in fishing behavior and harvest monitoring programs in this year.

Alternative 3 uses a time series of available landings (2016-2019) for the ACL/ACT Control Rule to calculate the ACT buffers that does not include the landings from 2020 in the calculations. This results in buffers of 17% for the recreational sector and 7% for the

commercial sector (Appendix D and E). This would maintain the same buffer as **Alternative 1** for the recreational sector and reduce the commercial buffer from 13% to 7%. Not including 2020 landings may be more representative of normal fishing practices as closures occurred for both sectors in the reference years as they had for the reference period under **Alternative 1**.

Table 2.2.3. Commercial and recreational sector ACTs in 2023 resulting from alternatives in Actions 1 and 2.

		Action 2 ACT					
		Alt 1 buffer		**Alt 2 buffer**		**Alt 3 buffer**	
		Rec	Comm	Rec	Comm	Rec	Comm
		17%	13%	13%	7%	17%	7%
Action 1	**Alt 1**	1,086,985*	421,411	1,139,369*	450,473	1,086,985*	450,473
	Alt 2	393,229	152,450	412,180	162,964	393,229	162,964
	Alt 3	432,961	86,443	453,827	92,405	432,961	92,405
	Alt 4	411,746	121,730	431,590	130,126	411,746	130,126
	Alt 5	418,984	109,794	439,176	117,366	418,984	117,366

* Values are in MRIP-CHTS currency for the recreational ACT values. All other recreational ACTs are presented in MRIP-FES currency. ACTs are presented for 2023 as this is the expected year of implementation.

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 Description of the Fishery

Detailed descriptions of the greater amberjack component of the Gulf of Mexico (Gulf) reef fish fishery can be found in Reef Fish Amendments 35 (GMFMC 2012) and 44 (GMFMC 2017c) to the Fishery Management Plan (FMP) for the Reef Fish Resources in the Gulf of Mexico (Reef Fish FMP). Those descriptions are summarized in the following sections and incorporated herein by reference. Additionally, Sections 3.4 and 3.5 provide information on the respective economic and social environments of the fishery. Management of the commercial and recreational sectors fishing for reef fish in federal waters began in 1984 with the implementation of the Reef Fish FMP. This FMP has been continuously updated through plan amendments and framework actions (also known as regulatory amendments). Resultant regulatory measures are codified at 50 CFR 622. A summary of reef fish management actions can be found on the Gulf of Mexico Fishery Management Council's (Council) web page[13] Management actions associated with greater amberjack can also be found in this document in Section 1.3.

At present, it seems that modifications to management measures, without substantially reducing the catch limits, have not made progress to rebuilding the greater amberjack stock. Each greater amberjack stock assessment since 2000 has determined the stock to be overfished and undergoing overfishing.

3.1.1 Commercial Sector

For the commercial sector, greater amberjack harvest is managed using an ACL, ACT, trip limit, minimum size limit, seasonal closure, and in-season and postseason accountability measures (AM). Since 1990, commercial operators harvesting reef fish from the Gulf exclusive economic zone (EEZ) must have a Gulf reef fish permit (GMFMC 1989), which is currently a limited access permit (GMFMC 2005a). In 2020, a total of 837 vessels held Gulf commercial reef fish permits. Over 99% of those permits have the mailing recipient in a Gulf state (Table 3.1.1.1).

[13] http://gulfcouncil.org/fishery-management/

Table 3.1.1.1. Number and percentage of vessels with a Gulf reef fish permit by state of mailing recipient (of permit) for 2020.

State	Gulf Reef Fish Permits	
	Number	**Percent**
AL	40	4.8%
FL	679	81.1%
LA	40	4.8%
MS	6	0.7&
TX	67	8.0%
Subtotal	832	99.4%
Other	5	0.6%
Total	**837**	**100.0%**

Source: NMFS SERO SF Access permits database.

Figure 3.1.1.1 shows changes in management measures and landings for the commercial greater amberjack sector since 1990. The commercial greater amberjack sector has a calendar fishing year and a seasonal closure from March 1 through May 31 (GMFMC 1997). The intent of the seasonal closure is to prevent in-season quota fishing year closures and to reduce fishing mortality during peak spawning months. The minimum commercial size limit is 36 inches fork length (FL) (GMFMC 1989). There is a trip limit of 1,000 lb ww until 75% of the ACT has been reached, at which point, the trip limit is reduced to 250 lb ww (GMFMC 2019). An in-season AM closes the commercial fishery for the remainder of the fishing year when the ACT is met or projected to be met (GMFMC 2008). Any overage of the ACL triggers a postseason payback AM. If commercial landings exceed the ACL, the ACT and the ACL are reduced for the following fishing year by the amount of the overage in the prior fishing year (GMFMC 2008). The commercial greater amberjack fishery has met its ACT and was subsequently closed in all years since 2009 until the COVID-19 pandemic began and a further trip limit reduction began in 2020 (Figure 3.1.1.1 and Table 3.1.1.2). Sector allocation and catch limits began in 2008 (GMFMC 2008). ACL overages started occurring in 2009 until right before the start of the fishing year in 2013, when a trip limit was implemented (GMFMC 2012). Only one codified ACL overage has occurred between 2013 and 2021 (2018)[14]. It is unclear if the onset and continuation of the COVID-19 pandemic, the reduction in the commercial trip limit, or a combination of both, prevented an in-season closure from occurring in 2020 and 2021.

[14] Overage of the codified ACL is presented in Table 3.1.1.2 since it is when this number is exceeded, a post season payback accountability measure is triggered for the following fishing year. This has been occurring since 2018. Prior to that, the post season payback accountability measure was triggered if the adjusted ACL was exceeded.

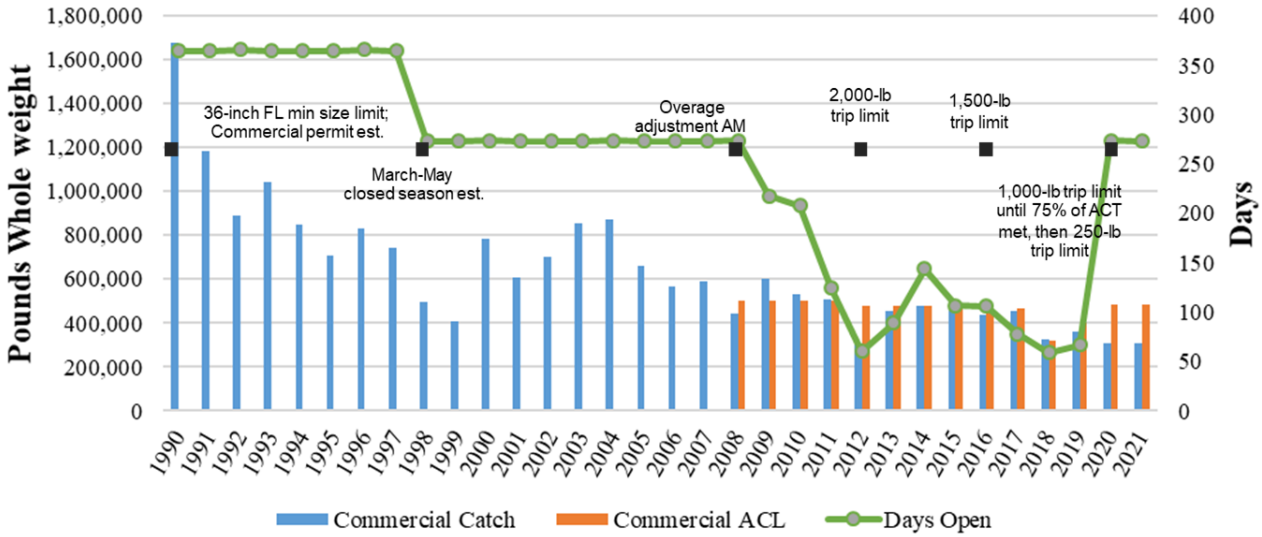

Figure 3.1.1.1. Greater amberjack commercial management measure implementations, ACLs, landings, and season length for 1990-2020.
Source: SEFSC Commercial ACL data (Accessed March 8, 2022 for 1990-2020 and May 9, 2022 for 2021).

Table 3.1.1.2. Greater amberjack commercial landings, commercial ACT, payback-adjusted ACT, commercial ACL, payback-adjusted ACL, percent ACL landed, and closure dates for 2008-2021. Units are in pounds ww.

Year	Landings	Codified ACT	Adjusted ACT	Codified ACL	Adjusted ACL	Percent of Codified ACL Landed	Closure Date	Days Open
2008	440,936	N/A	N/A	503,000	None	87.7	None	274
2009	601,446	N/A	N/A	503,000	None	119.6	11/7/2009 74 FR 57261	218
2010	534,095	N/A	N/A	503,000	373,072	106.2	10/28/2010 75 FR 64171	208
2011	508,871	N/A	N/A	503,000	342,091	101.2	6/18/2011 re-opened 9/1/2011 closed 10/20/2011 76 FR 23909 76 FR 51905 76 FR 64248	125
2012	308,334	409,000	None	481,000	237,438	64.1	4/2/2012 77 FR 19563	60
2013	457,879	409,000	338,157	481,000	410,157	95.2	7/1/2013 78 FR 37148	89
2014	480,121	409,000	None	481,000	None	99.8	8/25/2014 79 FR 48095	144
2015	460,579	409,000	None	481,000	None	95.8	7/19/2015 80 FR 39715	107
2016	437,102	394,740	None	464,400	None	94.1	7/17/2016 81 FR 45068	106
2017	453,726	394,740	None	464,400	None	97.7	6/20/2017 82 FR 28013	78
2018	325,844	277,651	None	319,140	None	102.1	4/3/2018 83 FR 14202	59
2019	361,609	349,766	337,503	402,030	389,767	89.9	6/9/2019 84 FR 22073	67
2020	310,324	421,411	None	484,380	None	64.1	None	274
2021	309,360	421,411	None	484,380	None	63.9	None	273

Source: SEFSC Commercial ACL data (Accessed March 8, 2022 for 1990-2020 and May 9, 2022 for 2021).
Note: An ACL and in-season and postseason AMs were implemented in 2008 with Amendment 30A. An ACT was implemented in 2012 with Amendment 35. These landings vary from what is in Ch. 1 due to ACL monitoring data being used. Unlike for best available data for sector allocation determination (SEDAR 70 landings), ACL monitoring data is best available and what is used to project an in-season closure and determine what the poundage is for an ACL overage payback as these landings are more current. Due to the timing of publication of payback notices, total prior year overages based on landings and *Federal Register* noticed payback-adjusted ACLs may not match.

Hook-and-line has been the predominant gear in the commercial harvest of greater amberjack for the last 20 years, accounting for approximately 81.2% of total landings from 2014 through 2020; longlines accounted for approximately 6.4%; and other gear types (e.g., diving, nets) accounted for the rest (SEFSC Commercial ACL Data Set September 2021). Hook-and-line harvest has increased by 6% and longline harvest has decreased a little less than 1% since the 1992-2016 time series presented in a 2017 Framework (GMFMC 2017a). From 2014-2020, the majority of greater amberjack, 54.9%, were commercially harvested in waters adjacent to Florida, which has been on par for the past 10 years and is a slight increase (5%) since the 2010-2016 time series presented in a 2017 Framework (GMFMC 2017a). 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 with peak landings close to 2 million pounds (mp) occurring in the late eighties and early nineties. Landings have declined overall thereafter, however, this could in part be due to greater amberjack landings being lumped with other amberjack until 1992. From 1993 forward, landings for greater amberjack were recorded separately. Other management changes that have occurred since 1998 have constrained commercial landings and further explain the decline in landings. As mentioned previously, it is unclear the exact reason why commercial landings have been well below the commercial ACL since 2020, however, the long-term status of the stock being overfished and undergoing overfishing certainly plays a part.

3.1.2 Recreational Sector

For the recreational sector, greater amberjack harvest is managed using an ACL, ACT, bag limit, minimum size limit, seasonal closure, and in-season and postseason AMs. 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. Since 1996, for-hire operators harvesting reef fish from the Gulf EEZ must have a charter vessel/headboat (for-hire) permit for reef fish that is specifically assigned to that vessel (GMFMC 1995). The component currently operates under a limited access system (GMFMC 2003). 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. For charter vessels and headboats, if federal regulations for Gulf reef fish are more restrictive than state regulations, operators must comply with those federal regulations. In 2020, there were 1,289 for-hire fishing vessels with a valid or renewable/transferrable for-hire permit for reef fish (Table 3.1.2.1). 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. Approximately 62% (804) of the 1,289 for-hire vessel reef fish permits have mailing recipients in Florida. Texas recipients hold the second highest number of permits, with 15%. Collectively, approximately 99% of the permits have mailing recipients in one of the Gulf States.

Table 3.1.2.1. Number and percentage of valid or renewable for-hire reef fish permits by state of mailing recipient (of permit) for 2020.

State	For-Hire Reef Fish Permits by State of Recipient	
	Number	Percentage
Alabama	144	11.1%
Florida	804	62.4%
Louisiana	111	8.6%
Mississippi	28	2.2%
Texas	194	15.1%
Subtotal	1,281	99.4%
Other	8	0.6%
Total	**1,289**	**100.0%**

Source: NMFS SERO SF Access permits database.

Private recreational fishing vessels are not required to have a federal permit to harvest individual species or species complexes in the reef fish fishery from the Gulf EEZ. Anglers aboard these vessels, however, must either be federally registered or licensed in states that have a system to provide complete information on that state's saltwater anglers to the national registry.

The greater amberjack recreational sector has undergone numerous management measure changes since 1990 (Figure 3.1.2.1). The recreational greater amberjack fishery has a seasonal closure from November 1 through April 30 and June 1 through July 31 (GMFMC 2017b).[15] The intent of the split fishing year and seasonal closure was to extend the season for as long as possible, allow harvest of greater amberjack when red snapper was typically closed, and offer a season in both the fall and the spring. The minimum recreational size limit is 34 inches FL (GMFMC 2015). There is a bag limit of one fish per person (zero bag limit for captain and crew of for-hire vessels; GMFMC 1996). An in-season AM closes the recreational fishery for the rest of the fishing year when the ACT is met or projected to be met, however, the date when this will occur is not always easily projected (GMFMC 2008). Any overage of the ACL triggers a postseason payback AM. If recreational landings exceed the ACL, the ACT and the ACL are reduced for the following fishing year by the amount of the overage in the prior fishing year (GMFMC 2008). Even with a June seasonal closure start in 2012, the recreational greater amberjack fishery exceeded its ACL in all years from 2012 to 2016 with paybacks in 5 of the last 10 years (Table 3.1.2.2). An increased minimum size limit was implemented in 2016 and a large overage of the ACL occurred (GMFMC 2015). This resulted in the shortest recreational season to date in 2017. The season closed in March 2017 with final landings exceeding the adjusted ACL, but not the codified ACL. Therefore, there was not a payback on the 2017/2018 fishing year when two frameworks were implemented that further reduced the catch limits and modified the fishing year and fixed closed season (GMFMC 2017a and 2017b). While the 2017/2018 fishing year appears as less days open than 2017, this is due to when the implementation of the second 2017 Framework (GMFMC 2017b) occurred, which resulted in only the month of May

[15] An emergency rule, effective July 25, 2022, modified the recreational fixed closed season to be August 1 – 31, 2022 and November 1, 2022 through July 31, 2023. At the end of the emergency rule time period, or implementation of Reef Fish Amendment 54, whichever comes first, the recreational fixed closed season will revert back to November 1 through April 30 and June 1 through July 31.

being open in that fishing year. Since implementation of these Frameworks, the recreational sector has only closed once (2018/2019) and has not exceeded its ACL or been subject to a payback (Figure 3.1.2.1 and Table 3.1.2.2).[16] As with the commercial sector, it is unclear the change to the recreational fishing year and fixed closed season, the onset and continuation of the COVID-19 pandemic, or a combination of all three, along with the long term status of the stock, has prevented an in-season closure from occurring in 2019/2020 and 2020/2021.

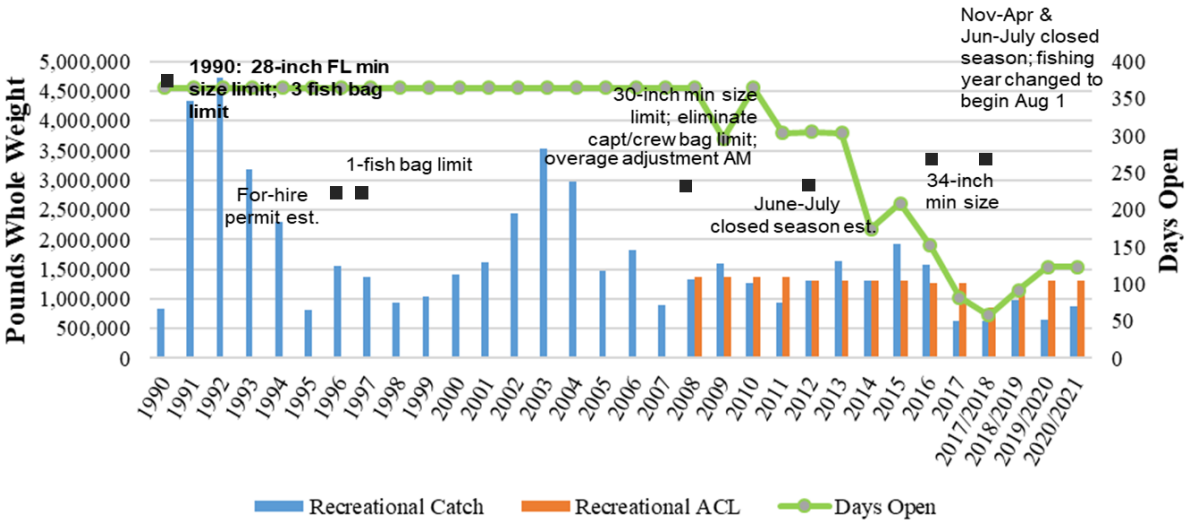

Figure 3.1.2.1. Greater amberjack recreational management measure implementations, ACLs, landings, and season length for 1990-2020. Units are in MRIP-CHTS.
Source: MRIP-CHTS landings - MRIPACLspec_rec81_20wv6_02Mar21w2014_2020LAcreel.xlsx.

[16] Overage of the codified ACL is presented in Table 3.1.2.2 since it is when this number is exceeded, a post season payback accountability measure is triggered for the following fishing year. This has been occurring since 2018. Prior to that, the post season payback accountability measure was triggered if the adjusted ACL was exceeded.

Table 3.1.2.2. Greater amberjack recreational landings in MRIP-Coastal Household Telephone Survey (CHTS) and MRIP-FES, recreational ACT, payback-adjusted ACT, recreational ACL, payback-adjusted ACL, percent of ACL landed, and closure dates for the years 2008 through 2021 in MRIP-CHTS. Units are in lbs ww.

Year	Landings MRIP-CHTS	Landings MRIP-FES	Codified ACT	Adjusted ACT	Codified ACL	Adjusted ACL	Percent of Codified ACL Landed	Closure Date	Days Open
2008	1,319,955	2,561,504	N/A	N/A	1,368,000	None	96.5	None	365
2009	1,604,289	2,482,621	N/A	N/A	1,368,000	None	117.3	10/24/2009 74 FR 54489	296
2010	1,268,182	2,992,744	N/A	N/A	1,368,000	1,243,184	92.7	None 75 FR 35335 76 FR 23909	365
2011	943,476	2,082,231	N/A	N/A	1,368,000	1,315,224	69.0	None 76 FR 23909	304
2012	1,301,684	2,987,024	1,130,000	None	1,299,000	None	100.2	None	305
2013	1,642,863	3,217,306	1,130,000	None	1,299,000	None	126.5	None	304
2014	1,303,657	2,327,463	1,130,000	888,829	1,299,000	1,057,829	100.4	8/24/2014 79 FR 48095	174
2015	1,933,746	2,618,841	1,130,000	None	1,299,000	None	148.9	9/28/2015 80 FR 56930	209
2016	1,567,866	2,353,695	1,092,372	1,034,442	1,255,600	1,197,670	124.9	8/1/2016 81 FR 48719	152
2017	624,941	1,011,487	1,092,372	335,741	1,255,600	498,969	49.8	3/24/2017 82 FR 14477	82
2017/ 2018*	624,599	1,011,146	716,173	None	862,860	None	72.4	None	58
2018/ 2019	967,434	1,814,607	902,185	None	1,086,970	None	89.0	5/1/2019 84 FR 10995	92
2019/ 2020	641,111	856,530	1,086,985	None	1,309,620	None	49.0	None	123
2020/ 2021	865,105	1,596,296	1,086,985	None	1,309,620	None	66.1	None	123

Source: MRIP-CHTS landings - MRIPACLspec_rec81_20wv6_02Mar21w2014_2020LAcreel.xlsx. MRIP-FES landings - MRIP_FES_rec81_20wv6_02Mar21w2014to2020LAcreel.xlsx.
Note: An ACL, and in-season and postseason AMs were implemented in 2008 with Amendment 30A. An ACT was implemented in 2012 with Amendment 35. The recreational fishing year was changed to August 1 through July 31 in 2018 with a Reef Fish Framework. Due to the timing of publication of payback notices, total prior year overages based on landings and *Federal Register* noticed payback-adjusted ACLs may not match.

* Landings from January 1 – January 27, 2018 and May 2018 (closed January 28 – April 30 and June 1 – July 31). All 2017 landings are attributed to the 2017 fishing year.

The primary recreational gear type used to harvest greater amberjack from 2014-2020 is hook-and-line (90.4%). The only other gear type reported for recreational harvest is spear (9.6%). For the years 2014-2020, the private angler fishing mode has been the dominant fishing mode, accounting for approximately 54.4% of total recreational landings of greater amberjack, followed by charterboats (41.1%) and headboats (3.5%). Private angler harvest has increased by 6% while harvest from charterboats (3%) and headboats (3.5%) has decreased since the 1992-2016 time series presented in a 2017 Framework (GMFMC 2017a). From 2014-2020, the majority of greater amberjack, 77.6%, were recreationally harvested in waters adjacent to Florida and Alabama. This is approximately a 10% decrease in landings off these states since the 2010-2016 time series presented in a 2017 Framework (GMFMC 2017a). However, this is expected since the fishing year and fixed closed season was modified in 2018, which allowed harvest in the fall, which is typically when the other Gulf states land greater amberjack (GMFMC 2017a and 2017b).

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 MRIP, the Southeast Region Headboat Survey (SRHS), the Texas Parks and Wildlife Department (TPWD), and the Louisiana Creel Survey. Unlike the commercial sector, recreational greater amberjack has historically been a larger component of total reef fish recreational landings in the Gulf. Greater amberjack landings were cyclical from the early eighties until the mid-2000s with peak landings of 7.0 mp MRIP-CHTS/18.3 mp MRIP-FES equivalent occurring in 1987. Management changes that have occurred since the mid-2000s have constrained recreational landings and can further explain reduced landings. However, as mentioned previously, it is unclear why recreational landings have been well below the recreational ACL since 2019/2020.

3.2 Description of the Physical Environment

General Description of the Physical Environment

The physical environment for Gulf reef fish is detailed in the Environmental Impact Statement for the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004), Generic EFH Amendment 3 (GMFMC 2005b), and the Generic Annual Catch Limit/Accountability Measure (ACL/AM) Amendment (GMFMC 2011a), which are hereby incorporated by reference and summarized below.

The Gulf of Mexico (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). Gulf water temperatures

range from 54º F to 84º F (12º C to 29º C) depending on time of year and depth of water. Mean annual sea surface temperatures ranged from 73º F through 83º F (23-28º C) including bays and bayous (Figure 3.1.1) between 1982 and 2009, according to satellite-derived measurements.[17] In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

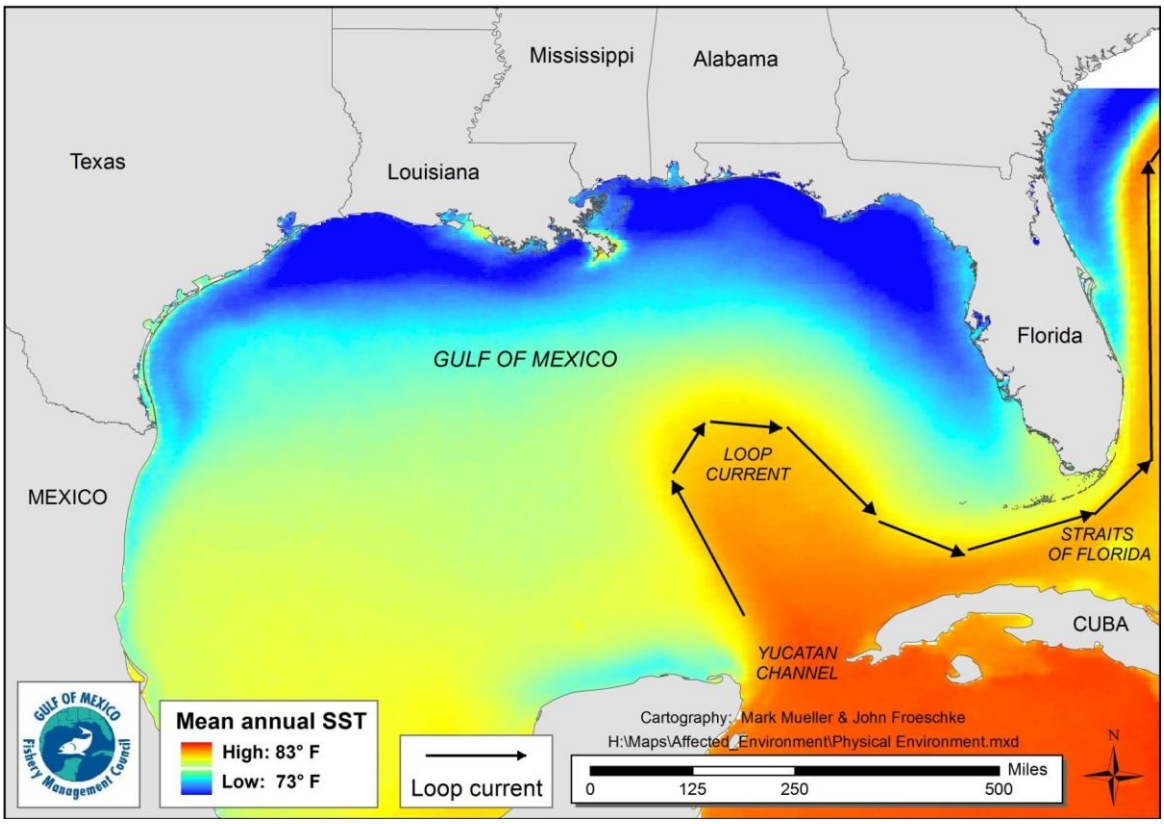

Figure 3.2.1. Mean annual sea surface temperature derived from the Advanced Very High-Resolution Radiometer Pathfinder Version 5 sea surface temperature data set.[18]

General Description of the Reef Fish Physical Environment

In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. A planktonic larval stage lives in the water column and feeds on zooplankton and phytoplankton (GMFMC 2004). Juvenile and adult reef fish are typically demersal and usually associated with bottom topographies on the continental shelf (less than 100 m) which have high relief, i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings. However, several species are found over sand and soft-bottom substrates. For example, juvenile red snapper are common on mud bottoms in the northern Gulf, particularly off Texas through Alabama. Also, some juvenile snapper (e.g., mutton, gray, red, dog, lane, and yellowtail snappers) and grouper (e.g., goliath,

[17] http://accession.nodc.noaa.gov/0072888

[18] http://pathfinder.nodc.noaa.gov

red, gag, and yellowfin groupers) are associated with inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems.

Fish species within the genus *Seriola*, including greater amberjack, are distributed circumglobally (Swart et al. 2015). In the Gulf, they are found primarily offshore and have been documented in depths up to 187 m (Reed et al. 2005). Burns et al. (2004) tagged greater amberjack from the Florida Keys to Pulley Ridge and collected them from a minimum depth of 4.6 m. All life stages can be water column associated. Additionally, postlarvae and juveniles are found in drifting algae (Hoffmayer et al. 2005). Late juveniles and adults are associated with hard bottom (Gledhill and David 2004) and adults and spawning adults have been documented on reefs based on research conducted in the U.S. south Atlantic and Caribbean (Harris et al. 2007; Heyman and Kierfye 2008). Another habitat type identified for adults were banks/shoals (Kraus et al. 2006). Lastly, while artificial reefs are not identified as EFH habitat type, greater amberjack have been documented utilizing them (Dance et al. 2011; Patterson et al. 2014).

Habitat Areas of Particular Concern (HAPC) and Environmental Sites of Special Interest

Detailed information pertaining to HAPCs is provided in Generic Amendment 3 for addressing EFH, HAPC (GMFMC 2005b) and Amendment 9 to the Fishery Management Plan for the Coral and Coral Reefs of the Gulf of Mexico, U.S. Waters (GMFMC 2018). Detailed information pertaining to the Gulf area closures and marine reserves is provided in Amendment 32 to the Fishery Management Plan for the Reef Fish Resources in the Gulf of Mexico (GMFMC 2011b). There are environmental sites of special interest that are discussed in the Generic EFH Amendment (GMFMC 2004) that are relevant to Reef Fish management. These documents are hereby incorporated by reference.

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 resulting in increasing nutrient inputs to multiple rivers. These tributaries feed in to the Mississippi River, which disperses to the Gulf, and creates a temperature and salinity dependent layering of waters. The nutrient rich fresh waters from the Mississippi create seasonal, large algal blooms at the surface that eventually die, sink to the bottom, and decompose. This creates the oxygen-poor, hypoxic, bottom water layer unless front or storm events occur, which allows for mixing of the layers (Rabalais and Turner 2019). Mapping of the hypoxic zone began in 1985. For 2021, the extent of the hypoxic area was 6,334 square miles, almost triple what it was in 2020 (2,116 square miles), but still less than the extent of the 2017 hypoxic area (8,776 square miles). The changes in hypoxic area can be attributed to changing amounts of river discharge and its associated nutrient load and storm events. The major factor for the reduced size in 2020 was the active storm season with Hurricane Hanna passing right over the zone, allowing for mixing of the waters. The 2021 hypoxia area was higher than the 5-year hypoxic area average (5,408 square miles) and much larger than the 1,930 square mile goal set by the Interagency Mississippi River and Gulf of Mexico Hypoxia Task Force to be reached by 2035.[19] The hypoxic conditions in the northern Gulf directly impact less mobile benthic macroinvertebrates (e.g., polychaetes) by influencing density, species richness,

[19] http://gulfhypoxia.net

and community composition (Baustian and Rabalais 2009; Breitburg et al. 2018). However, more mobile macroinvertebrates and demersal fishes, such as greater amberjack, are able to detect lower dissolved oxygen levels and move away from hypoxic conditions. Therefore, these organisms are indirectly affected by limited prey availability and constrained available habitat (Baustian and Rabalais 2009; Craig 2012).

Greenhouse gases

The Intergovernmental Panel on Climate Change (IPCC) has indicated greenhouse gas emissions are one of the most important drivers of recent changes in climate. Wilson et al. (2017) inventoried the sources of greenhouse gases in the Gulf from sources associated with oil platforms and those associated with other activities such as fishing. A summary of the results of the inventory are shown in Table 3.2.1 with respect to total emissions and fishing. Commercial fishing and recreational vessels make up a small percentage of the total estimated greenhouse gas emissions from the Gulf (2.04% and 1.67%, respectively).

Table 3.2.1. Total Gulf greenhouse gas 2014 emissions estimates (in 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	CO_2	Greenhouse CH_4	Gas N_2O	Total CO_{2e}**
Oil platform	5,940,330	225,667	98	11,611,272
Non-platform	14,017,962	1,999	2,646	14,856,307
Total	**19,958,292**	**227,665**	**2,743**	**26,467,578**
Commercial fishing	531,190	3	25	538,842
Recreational fishing	435,327	3	21	441,559
Percent commercial fishing	2.66%	>0.01%	0.91%	2.04%
Percent recreational fishing	2.18%	>0.01%	0.77%	1.67%

*Compiled from Tables 6–11, 6–12, and 6–13 in Wilson et al. (2017). **The 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.

3.3 Description of the Biological/Ecological Environment

The biological environment of the Gulf, including the species addressed in this amendment, is described in detail in the Generic EFH Amendment (GMFMC 2004), Generic ACL/AM Amendment (GMFMC 2011a), and Reef Fish Amendments 30A (GMFMC 2008) and 35 (GMFMC 2012) which are hereby incorporated by reference and summarized below.

Greater Amberjack Life History and Biology

Studies conducted in the Gulf have estimated that peak spawning occurs during the months of 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).

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). Harris et al. (2007) provided information on reproduction in the southeastern U.S. Atlantic using fishery-dependent and fishery-independent samples from 2000 - 2004. Additionally, sexual dimorphism was evident with females generally being larger than males (Harris et al. 2007). Females reach 50% maturity at 733 millimeter (mm) fork length (FL) and males attain 50% maturity at 644 mm FL (Harris et al. 2007). However, 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. 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 within this area. They estimated a spawning season of approximately 73 days off south Florida, with a spawning periodicity of 5 days, and that an individual female could spawn as frequently as 14 times during the season. Wells and Rooker (2004) conducted studies in the northwestern Gulf on larval and juvenile fish associated with floating *Sargassum* spp. 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 for reproductive estimates have 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.

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. In summary, according to SEDAR 70, the greater amberjack stock has been overfished and undergoing overfishing almost continuously since 1980.

Bycatch

See Bycatch Practicability Assessment Appendix

In summary, studies have documented low bycatch and bycatch mortality of finfish while targeting greater amberjack due to the ability for fishermen to specifically target schools of greater amberjack when the season is open and avoid them during times of closure. Other reef fish species known to be incidentally caught include almaco jack, vermillion snapper and some deep-water groupers. Of these species, the jacks complex, which includes almaco jack, is currently undergoing overfishing. However, the overfished status of almaco jack and deep-water groupers is unknown (National Marine Fisheries Service [NMFS] 1st quarter 2022 Update Summary of Stock Status for non-Federal Strategic Sourcing Initiative [FSSI] stocks)[20]. Minimum size limits are estimated to be the greatest source of regulatory discards for the majority of reef fish species. The greater amberjack recreational sector is currently constrained to a 34-inch FL minimum size limit and the commercial sector is constrained to a 36-inch FL minimum size limit. Bag and trip limits can also play a part in bycatch, although not as significant a role as minimum size limits. Due to the ability for fishermen to be selective of greater amberjack, very little bycatch of target or non-target species is expected in the greater amberjack fishery for either sector, even under reduced catch limits. Interactions with other species such as sea turtles and sea birds are known to occur, but are minimal (see next section).

This amendment considers measures that are expected to affect greater amberjack discard mortality due to reducing catch limits. However, there is some biological benefit to the managed species that outweigh any increases in discards from the action due to the ability for fisherman to target this species and for more fish to remain in the water due to reducing harvest. Discard mortality increase for reef fish has been positively correlated with warmer water temperatures (Pulver 2017). The current fixed closed seasons have harvest for both sectors closed during these times. While general discard mortality for greater amberjack has been found to be variable and at times high (Stephen and Harris 2010), Murie and Parkyn (2008) found that release mortality for greater amberjack was not affected by capture depth and rates were less than the assumed release mortality used in the Southeast Data Assessment and Review (SEDAR) 33 stock assessment. In any case, discards are anticipated to be minimal due to fishermen being able to avoid schools of greater amberjack during closed seasons.

General Information on Reef Fish Species

The currently are 31 species managed under the Reef Fish FMP. The NMFS Office of Sustainable Fisheries updates its Status of U.S. Fisheries Report to Congress on a quarterly basis utilizing the most current stock assessment information. Stock assessments and status determinations have been conducted and designated for 14 stocks and can be found on the Council[21] and SEDAR[22] websites. Of the 14 stocks for which stock assessments have been conducted and accepted by the SSC, the second quarter 2022 Update Summary of Stock Status

[20] https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates
[21] www.gulfcouncil.org
[22] http://sedarweb.org/

for non-FSSI stocks classifies two stocks as overfished (greater amberjack and gag) and three stocks undergoing overfishing (cobia, greater amberjack, and gag). The status of both assessed and unassessed stocks, as of the writing of this amendment is provided on the status of the stocks webpage.

Protected Species and Protected Species Bycatch

NMFS manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). A brief summary of these two laws and more information is available on NMFS Office of Protected Resources website.[23] ESA-listed species or Distinct Population Segments (DPS) of marine mammals, sea turtles, fish, and corals occur in the exclusive economic zone (EEZ) of the Gulf. There are numerous stocks of marine mammals managed within the Southeast region. All marine mammals in U.S. waters are protected under the MMPA.

The five whale species that may be present in the Gulf (blue, sperm, sei, fin, and Rice's[24]) are listed as endangered under the ESA. Rice's whales are the only resident baleen whales in the Gulf recently being listed as endangered. Manatees, listed as threatened under the ESA, also occur in the Gulf and are the only marine mammal species in this area managed by the U.S. Fish and Wildlife Service.

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

The most recent biological opinion (BiOp) for the FMP was completed on September 30, 2011. The BiOp determined the operation of the Gulf reef fish fishery managed under the Reef Fish FMP is not likely to adversely affect ESA-listed marine mammals or coral, and was not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) or smalltooth sawfish. Since issuing the opinion, in memoranda dated September 16, 2014, and October 7, 2014, NMFS concluded that the activities associated with the Reef Fish FMP are not likely to adversely affect critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle DPS and four species of corals (lobed star, mountainous star, boulder star, and rough cactus). On September 29, 2016, NMFS requested re-initiation of Section 7 consultation on the operation of reef fish fishing managed by the Reef Fish FMP because new species (i.e., Nassau grouper [81 FR 42268] and green sea turtle North Atlantic and South

[23] https://www.fisheries.noaa.gov/about/office-protected-resources

[24] The Gulf of Mexico Bryde's whale has recently been identified as morphologically and genetically distinct from other whales under the Bryde's whale complex, warranting classification as a new species of baleen whale living in the Gulf of Mexico to be named *Balaenoptera ricei* or Rice's whale.

Atlantic DPSs [81 FR 20057]) were listed under the ESA that may be affected by the proposed action. NMFS documented a determination that the operation of the fishery to continue during the re-initiation period is not likely to adversely affect these species.

On January 22, 2018, NMFS published a final rule (83 FR 2916) listing the giant manta ray as threatened under the ESA. On January 30, 2018, NMFS published a final rule (83 FR 4153) listing the oceanic whitetip shark as threatened under the ESA. In a memorandum dated March 6, 2018, NMFS revised the request for re-initiation of consultation on the Reef Fish FMP to address the listings of the giant manta and oceanic whitetip. In that memorandum, NMFS also determined that fishing under the Reef Fish FMP during the extended re-initiation period will not jeopardize the continued existence of the giant manta ray, oceanic whitetip shark, Nassau grouper, or the North Atlantic and South Atlantic DPSs of green sea turtles.

NMFS published a final rule on April 15, 2019, listing the Gulf Bryde's (now Rice's whale) whale as endangered. In a memorandum dated June 20, 2019, NMFS revised the re-initiation request to include the Gulf Bryde's (Rice's whale)whale and determined that fishing under the Reef Fish FMP during the re-initiation period will not jeopardize the continued existence of any of the newly listed species discussed above.[25]

There is no information to indicate marine mammals and birds rely on greater amberjack for food, and they are not generally caught by fishermen harvesting greater amberjack. The primary gear in the Gulf Reef Fish fishery used to harvest greater amberjack is hook-and-line. This gear is classified in the 2022 Marine Mammal Protection Act List of Fisheries as a Category III fishery (87 FR 23122), meaning the annual mortality and serious injury of a marine mammal resulting from the fishery is less than or equal to 1% of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. Additionally, there is no evidence that the Gulf greater amberjack fishery as a whole is adversely affecting seabirds. Dolphins are the only species documented as interacting with the reef fish fishery. Bottlenose dolphins prey upon bait, catch, and/or released discards of fish from the reef fish fishery. They are also a common predator around reef fish vessels, feeding on the discards.

Deepwater Horizon MC252 Oil Spill

The presence of polycyclic aromatic hydrocarbons (PAH), which are highly toxic chemicals that tend to persist in the environment for long periods of time, in marine environments can have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2012). The future reproductive success of 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

[25] Any official change to the name of the species listed under the ESA as the Gulf of Mexico Bryde's whale has no effect on NMFS's conclusion that the activities associated with the Reef Fish FMP will not jeopardize the continued existence of the species during the revised reinitiation period.

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).
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 wellhead (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. 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). The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern. More information about the *Deepwater Horizon* MC252 oil spill is available on the NOAA Southeast Regional Office website.[26]

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 (IPCC).[27] These changes are likely to affect plankton biomass and fish larvae abundance that could adversely impact fish, marine mammals, seabirds, and ocean biodiversity. Kennedy et al. (2002) and Osgood (2008) have suggested global climate change could affect temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; change precipitation patterns and cause a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influence the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs. The National Oceanic and Atmospheric Association (NOAA) Climate Change Web Portal[28] predicts the average sea surface temperature in the Gulf and South Atlantic will increase by 2-4ºF (1–3ºC) for 2010–2070 compared to the average over the years 1950–2010. For reef fishes and snapper-grouper species, Burton (2008) and Morley et al. (2018) speculated climate change could cause shifts in spawning seasons, changes in migration patterns, and changes to basic life history parameters such as growth rates.

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 (Sokolow 2009; Hollowed et al. 2013; Maynard et al. 2015; Wells et al. 2015; Gobler 2020). Some stocks have already shown increases in abundance in the northern Gulf (Fodrie et al. 2010) and Texas estuaries (Tolan and Fisher 2009). Integrating the potential effects of climate change into the fisheries assessment process is currently difficult due to the assessment rarely projecting through a time span that would include detectable climate change effects (Hollowed et al. 2013). However, there are ecosystem models available or being

[26] https://www.fisheries.noaa.gov/news/deepwater-horizon-10-years-later-10-questions
[27] http://www.ipcc.ch/
[28] https://www.esrl.noaa.gov/psd/ipcc/

developed that incorporate future, potential, climate change effects (King and McFarlane 2006; Pinsky and Mantua 2014; Gruss et al. 2017; Chagaris et al. 2019). While complex, these factors do not change the reality of climate change impacts on managed species and the need to incorporate this information into stock assessments. Better planning and collaboration with managers are currently being pursued to include this type of data into the assessment process.

The Southeast Fisheries Science Center (SEFSC) has developed climate vulnerability analyses (CVA)[29] that can be used to determine the vulnerability of greater amberjack to climate change stressors. According to the SEFSC CVA, and as is the case for many species in the Gulf, greater amberjack have high projected exposure to climate-driven changes in environmental variables, especially to sea surface temperatures, ocean acidification, dissolved oxygen, and salinity. However, greater amberjack's biological traits (Figure 3.3.1) resulted in low sensitivity. While greater amberjack have moderate life history requirements (biological traits were generally ranked moderate to low), they can also move around moderately well to find sufficient conditions, and so they have a low overall climate vulnerability with some probability that overall vulnerability could be moderate. Generally, the Gulf is projected by the SEFSC models used (CMIP5) to become warmer, saltier, less oxygenated, and more acidic everywhere during the current fifty years. Conditions will have similar, but amplified, patterns in the 2056–2099 period (Quinlan et al. in press).

[29] https://www.fisheries.noaa.gov/national/climate/climate-vulnerability-assessments

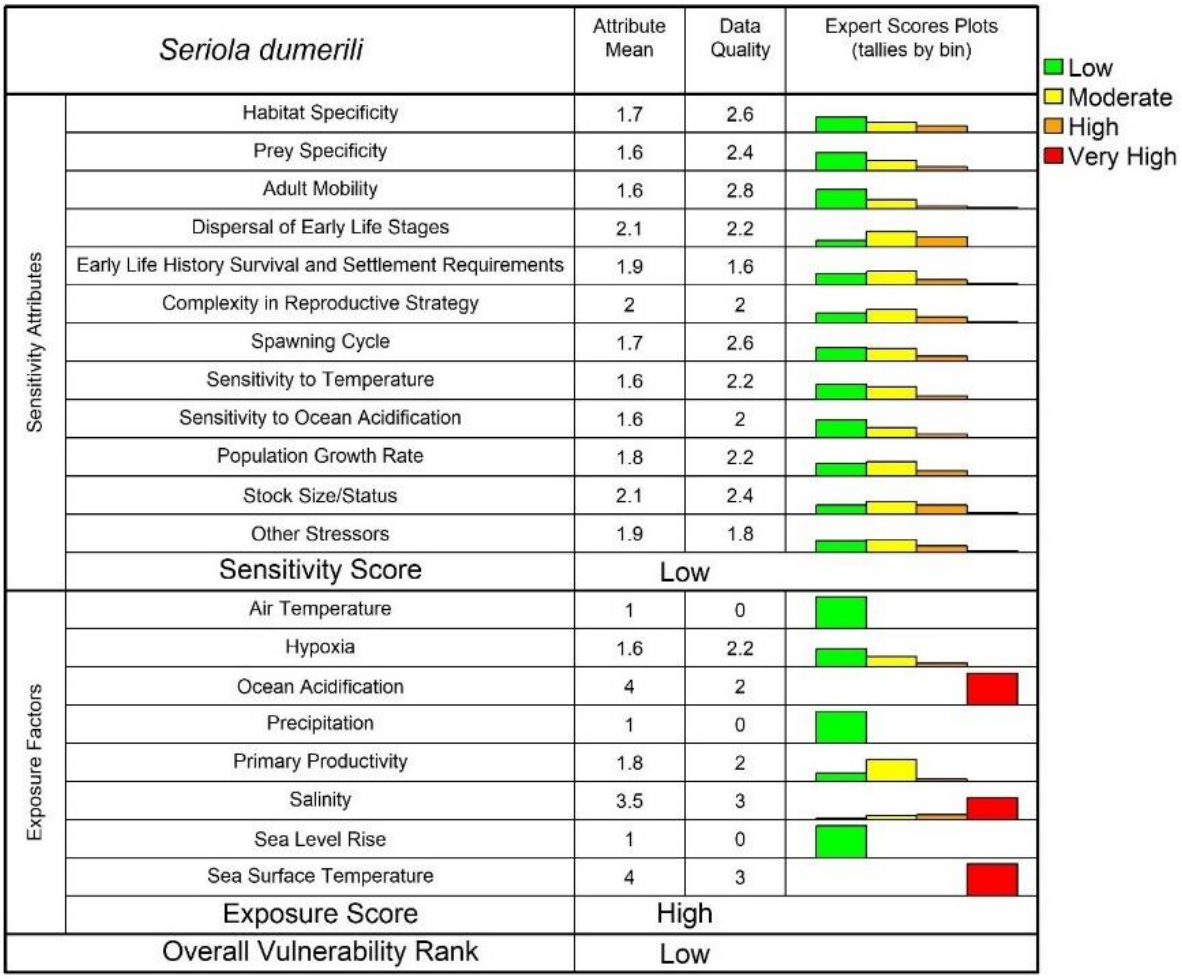

Figure 3.3.1. Greater amberjack biological processes analyzed for climate change sensitivities.

3.4 Description of the Economic Environment

A description of the greater amberjack stock is provided in Section 3.1.

Commercial Sector

Permits

Greater amberjack (*Seriola dumerili*) is one of 31 reef fish species managed by the Gulf of Mexico Fishery Management Council (Council). Greater amberjack is in the Council's Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf of Mexico. Any fishing vessel that harvests and sells greater amberjack from the Gulf EEZ must have a valid Gulf reef fish commercial permit. Commercial Gulf reef fish permits are a limited access permit. After a permit expires, it can be renewed or transferred up to one year after the date of expiration. As shown in Table 3.4.1.1, the number of permits that were valid at any point in a given year decreased steadily from 2016-2020. There were approximately 2% fewer valid permits in 2020 relative to 2016.

Table 3.4.1.1. Number of valid Gulf reef fish permits, 2016-2020.

Year	Number of Permits
2016	852
2017	850
2018	845
2019	842
2020	837

Source: NMFS SERO Sustainable Fisheries (SF) Access permits database.

Vessels

The information in Tables 3.4.1.2 and 3.4.1.3 describes the landings and revenue for vessels that harvested Gulf greater amberjack in each year from 2016 through 2020, as well as their revenue from other species. Vessel participation has been highly variable from 2016-2020, with a 23% decline in active vessels in 2018, relative to 2016, but a 5% increase overall increase in vessels that harvested greater amberjack by 2020. Overall landings of greater amberjack were also variable during this time period, but fell by 28% in 2020 relative to 2016. Alternatively, landings of jointly caught species on greater amberjack trips increased by 52% in 2020 relative to 2016. On average from 2016-2020, greater amberjack accounted for only 18% of total landings by vessels harvesting Gulf greater amberjack.

Table 3.4.1.2. Number of vessels, trips, and landings (lbs gw) by year for Gulf greater amberjack

Year	# of vessels that caught GAJ (> 0 lbs gw)	# of trips that caught GAJ	GAJ landings (lbs gw)	Other species' landings jointly landed w/ GAJ	# of Gulf trips that only landed other species	Other species' landings on trips w/o GAJ	All species landings on South Atlantic trips (lbs gw)
2016	212	702	399,271	1,677,617	3,605	686,330	198,048
2017	223	679	424,259	1,209,130	3,258	762,637	163,609
2018	162	403	291,928	704,475	2,174	554,521	75,218
2019	186	511	322,602	990,425	2,703	609,595	82,877
2020	223	783	286,368	2,554,298	2,542	578,909	22,780
Average	201	616	344,886	1,427,189	2,856	638,398	108,506

Source: SEFSC-SSRG Socioeconomic Panel (Jan 2022 version)

Overall dockside revenue of greater amberjack was also variable during this time period, but fell by 22% in 2020 relative to 2016. Alternatively, revenue from jointly caught species on greater amberjack trips increased by 58% in 2020, relative to 2016. On average from 2016-2020, greater amberjack accounted only for only 22% of total revenue by vessels harvesting Gulf greater amberjack.

Table 3.4.1.3. Number of vessels and ex-vessel revenues by year (2020 dollars) for Gulf greater amberjack

Year	# of vessels that caught GAJ (> 0 lbs gw)	Dockside revenue from GAJ	Dockside revenue from 'other species' jointly caught w/ GAJ	Dockside revenue from 'other species' caught on trips w/o GAJ	Dockside revenue from 'all species' caught on Gulf trips	Total dockside revenue	Average total dockside revenue per vessel
2016	212	$737,659	$7,200,937	$39,061,115	$587,573	$47,587,284	$224,468
2017	223	$804,404	$5,110,132	$32,487,374	$514,713	$38,916,623	$174,514
2018	162	$571,244	$3,179,169	$23,110,062	$277,899	$27,138,374	$167,521
2019	186	$616,945	$4,613,077	$30,651,039	$299,559	$36,180,620	$194,519
2020	223	$578,909	$11,405,948	$29,863,217	$84,318	$41,932,392	$188,038
Average	201	$661,832	$6,301,853	$31,034,561	$352,812	$38,351,059	$190,612

Source: SEFSC-SSRG Socioeconomic Panel (Jan 2022 version)

The information in Tables 3.4.1.4 and 3.4.1.5 describes the average landings and revenue for vessels that harvested Gulf greater amberjack for each month, as well as their revenue from other species. On average, the greatest number of greater amberjack trips were taken in February and January (53%). Landings were also predominant in those months, 19% and 17% respectively. However, landings in the month of June accounted for 18% of all landings annually on average, thus, the catch of greater amberjack per trip was highest on average in June.

Table 3.4.1.4. Average number of vessels, trips, and landings (lbs gw) by year for Gulf greater amberjack 2016-2020.

Month	# of vessels that caught GAJ (> 0 lbs gw)	# of trips that caught GAJ	GAJ landings (lbs gw)	Other species' landings jointly caught w/ GAJ	# of trips that only caught other species	Other species' landings on trips w/o GAJ	All species landings trips (lbs gw)
January	58	261	140,140	359,558	106	477,350	977,047
February	66	276	141,452	517,861	119	446,994	1,106,307
March	*	*	*	*	*	*	*
April	*	*	*	*	*	*	*
May	*	*	*	*	*	*	*
June	43	201	91,196	351,428	169	532,317	974,941
July	26	124	29,843	142,021	259	704,485	876,349
August	15	30	3,701	65,701	316	771,283	840,686
September	13	18	5,242	66,159	308	766,291	837,693
October	10	16	3,527	53,147	260	725,233	781,907
November	10	13	1,875	52,802	275	739,902	794,579
December	13	26	5,212	56,337	295	864,801	926,350

Source: SEFSC-SSRG Socioeconomic Panel (Jan 2022 version)
*** Commercial sector is closed

Similar to landings, Gulf greater amberjack dockside revenue is highest on average in the months of February, January, and June. Joint caught species revenues were also highest in these months. Revenue from other species not caught jointly with greater amberjack were highest in the months of March, December, and August.

Table 3.4.1.5. Number of vessels and ex-vessel revenues by month (2020 dollars) for Gulf greater amberjack.

Month	# of vessels that caught GAJ (> 0 lbs gw)	Dockside revenue from GAJ	Dockside revenue from 'other species' jointly caught w/ GAJ	Dockside revenue from 'other species' caught w/o GAJ	Total dockside revenue	Average total dockside revenue per vessel
January	98	$256,771	$1,529,232	$2,061,891	$3,847,894	$39,331
February	110	$259,303	$2,248,939	$1,903,206	$4,411,447	$40,287
March***	*	*	*	*	*	*
April***	*	*	*	*	*	*
May***	*	*	*	*	*	*
July	37	$47,500	$548,631	$2,841,066	$3,437,197	$93,402
August	19	$6,963	$293,397	$3,163,739	$3,464,099	$182,321
September	14	$9,731	$296,820	$3,125,447	$3,431,998	$252,353
October	13	$6,592	$225,144	$2,989,336	$3,221,072	$257,686
November	10	$3,699	$240,485	$3,019,520	$3,263,704	$339,969
December	11	$9,874	$239,734	$3,543,221	$3,792,829	$339,656

*** Commercial season is closed
Source: SEFSC-SSRG Socioeconomic Panel (Jan 2022 version)

Estimates of economic returns are not directly available for the greater amberjack commercial sector in the Gulf. The most recent analysis which calculated estimates of economic returns for gulf commercial fishing vessels was Liese and Overstreet (2016). Liese and Overstreet calculated economic returns for Gulf reef fish vessels as well as other segments of interest (SOI). In most cases, these SOIs are at the species or species group and/or at the gear-level, such as red snapper or longline trips. Liese and Overstreet (2016) produce estimates for a Gulf jacks[30] SOI, which can be used as a proxy for greater amberjack estimates. These estimates are specific to economic performance in 2014, 2015 and 2016, respectively. The analysis also provides average estimates of economic returns across 2014-2016, which are the most useful for current purposes. Estimates in the analysis are based on a combination of Southeast Coastal logbook data, a supplemental economic add-on survey to the logbooks, and an annual economic survey at the vessel level. The economic surveys collect data on gross revenue, variable costs, fixed costs, as well as some auxiliary economic variables (e.g., market value of the vessel). The analysis provides estimates of critical economic variables for the commercial sector in the Gulf reef fish

[30] Per Liese and Overstreet (2016) The jacks SOI "consists of all logbook trips by permitted vessels where at least one pound of jack species managed by the GOM Reef Fish FMP was landed in 2016 using any gear type. Jack species managed include greater amberjack, lesser amberjack, banded rudderfish, and almaco jack. Greater amberjack is by far the most important species in this SOI, accounting for the majority of SOI landings."

fishery. In addition, estimates are provided at the trip level and the annual vessel level, of which the latter are most important for current purposes. Findings from the analysis are summarized below.

From an economic returns perspective, the two most critical results at the trip level are the estimates of trip net cash flow and trip net revenue. Trip net cash flow is trip revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and purchases of annual allocation from other allocation holders. Thus, this estimate represents the amount of cash generated by a typical Gulf Jacks trip over and above the cash cost of taking the trip (i.e., variable costs of the trip) and is a proxy for producer surplus (PS) at the trip level. Trip net revenue is trip revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and the opportunity cost of owner's time as captain. By including opportunity cost of the owner's time and excluding purchases of annual allocation, trip net revenue is a measure of the commercial fishing trip's economic profit.

Table 3.4.1.6 illustrates the economic "margins" generated on Gulf Jacks trips, i.e., trip net cash flow and trip net revenue as a percentage of trip revenue. As shown in this table, 16% and 33% (or 49% in total) of the average revenues generated on Gulf jack trips were used to pay for fuel/supplies costs and crew labor costs, while the remaining 51% was net cash flow back to the owner(s). The margin associated with trip net revenue was lower at about 33%, as it accounts for the value of an owner operator's time. Thus, trip cash flow and trip net revenue were both positive on average from 2014 through 2016, generally indicating that Gulf jack trips were profitable during this time.

Table 3.4.1.6. Economic characteristics of Gulf Jacks trips 2014-2016 (2020$).

	2014	2015	2016	Average
Number of Observations	343	405	473	
Response Rate (%)	79%	81%	98%	
Trips				
Owner-Operated	67%	57%	63%	62%
Fuel Used per Day at Sea (gallons/day)	52	50	45	49
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	7.5%	5.1%	3.9%	5.5%
Bait	3.2%	3.5%	3.2%	3.3%
Ice	1.6%	1.7%	1.7%	1.7%
Groceries	2.6%	2.2%	3.0%	2.6%
Miscellaneous	2.7%	2.5%	3.3%	2.8%
Hired Crew	26.7%	26.8%	26.8%	26.8%
IFQ Purchase	14.2%	24.3%	20.0%	19.5%
Owner-Captain Time	7.3%	5.7%	5.7%	6.2%
Trip Net Cash Flow	42.0%	34.0%	38.0%	38.0%
Trip Net Revenue	48%	53%	52%	51%
Labor - Hired & Owner	34%	32%	33%	33%
Fuel & Supplies	18%	15%	15%	16%
Input Prices				
Fuel Price (per gallon)	$3.83	$2.74	$2.19	$2.92
Hire Crew Wage (per crew-day)	$304	$300	$307	$304
Productivity Measures				
Landings/Fuel Use (lbs./gallon)	12.6	13.3	13.5	13.1
Landings/Labor Use (lbs./crew-day)	219	226	214	220

Table 3.4.1.7 provides estimates of the important economic variables at the annual level for all vessels that had gulf jack landings from 2014 through 2016. Similar to the trip level, the three most important estimates of economic returns are net cash flow, net revenue from operations, as well as economic return on asset value. Of these measures, net revenue from operations most closely represents economic profits to the owner(s). Net cash flow is total annual revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, loan payments, and purchases of annual allocation. Net revenue from operations is total annual revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, and the opportunity cost of an owner's time as captain as well as the vessel's depreciation. Economic return on asset value is calculated by dividing the net revenue from operations by the vessel value.

Net cash flow and net revenue from operations at the annual vessel level were both positive from 2014-2016, generally indicating that Gulf Jacks vessels in the commercial sector were profitable.

Specifically, net cash flow and net revenue from operations averaged 26.3% and 38.3%, respectively. Interestingly, the economic return on asset value was approximately 72.2% during this time, indicating vessels in the jack fishery are highly efficient assets.

Table 3.4.1.7. Economic characteristics of Gulf jacks vessels from 2014-2016 (2020$).

	2014	2015	2016	Average
Number of Observations	51	62	68	
Response Rate (%)	64%	76%	86%	
Vessels				
Owner-Operated	71%	64%	68%	68%
For-Hire Active	15%	18%	17%	17%
Vessel Value	$167,414	$123,874	$108,363	$133,217
Total Revenue	100%	100%	100%	100%
Costs (% of Revenue)				
Fuel	8.5%	5.2%	5.7%	6.5%
Other Supplies	9.8%	9.0%	10.1%	9.6%
Hired Crew	26.8%	25.5%	24.9%	25.7%
Vessel Repair & Maintenance	7.0%	5.9%	6.7%	6.5%
Insurance	1.3%	0.6%	0.9%	0.9%
Overhead	5.8%	4.9%	3.7%	4.8%
Loan Payment	1.2%	1.1%	1.1%	1.1%
IFQ Purchase	11.3%	27.4%	15.6%	18.1%
Owner-Captain Time	4.4%	4.4%	5.4%	4.7%
Net Cash Flow	28%	20%	31%	26.0%
Net Revenue for Operations	33%	42%	40%	38%
Depreciation	3%	2%	3%	2.8%
Fixed Costs	14%	11%	11%	12%
Labor - Hired & Owner	31%	30%	30%	30%
Fuel & Supplies	18%	14%	16%	16%
Economic Return (on asset value)	50.2%	89.1%	77.3%	72.2%

Dealers

The information in Table 3.4.1.8 illustrates the purchasing activities of dealers that bought greater amberjack landings from vessels from 2016 through 2019.The total number of dealers purchasing greater amberjack varied greatly from 2016-2019. In 2018, the total number of dealers purchasing greater amberjack was approximately 27% fewer relative to 2016. However, in 2019 the total number of purchasing dealers increased by 49% relative to 2018. Overall, there were 17% more total dealers purchasing greater amberjack landings in 2019, relative to 2016.

Total value of greater amberjack landings purchases by dealers also varied between 2016 and 2019. Overall purchases of greater amberjack landings increased by 12% in 2019, relative to 2016. There was a significant increase in greater amberjack purchase between 2018 and 2019. Counter to the trend in the number of greater amberjack dealers, the average value of greater amberjack purchases per dealer declined by 2% from 2016-2019.

Total value of other species landings purchases by greater amberjack dealers followed a similar trend to the total value of greater amberjack landings. The overall value of other species purchases increased by 7% in 2020, relative to 2016. The average value of other species purchases declined by about 20% in 2020, relative to 2016. Overall, greater amberjack made up only approximately 1% of total purchases by greater amberjack dealers, indicating that there is a very low financial dependency on greater amberjack landings.

Table 3.4.1.8. Dealer statistics for dealers that purchased greater amberjack landings by year, 2016-2019. All dollar estimates are in 2020$.

Year	Number Dealers	Statistic	GAJ Purchases	Other Species Purchases	Total Purchases
2016	70	Maximum	$159,899	$7,718,910	$7,718,910
		Total	$824,535	$94,186,414	$95,010,949
		Mean	$9,370	$33,674	$32,933
2017	67	Maximum	$201,322	$6,304,068	$6,304,068
		Total	$814,930	$84,658,707	$85,473,637
		Mean	$10,584	$30,042	$29,525
2018	55	Maximum	$132,745	$6,989,466	$6,989,466
		Total	$585,928	$67,700,100	$68,286,029
		Mean	$8,745	$27,701	$27,195
2019	82	Maximum	$92,420	$8,241,815	$8,241,815
		Total	$866,841	$104,639,432	$105,506,359
		Mean	$8,583	$30,225	$29,603
2020	75	Maximum	$36,548	$8,127,755	$8,127,755
		Total	$603,641	$75,805,437	$76,409,078
		Mean	$3,530	$12,844	$12,582

Source: SEFSC Fishing Communities Web Query Tool, Version 1.

Imports

Imports of seafood products compete in the domestic seafood market and have in fact dominated many segments of the seafood market. Imports aid in determining the price for domestic seafood products and tend to set the price in the market segments in which they dominate. Seafood imports can have downstream effects on the local fish market. At the harvest level, imports can affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to domestic production, imports tend to cushion the adverse economic effects on consumers resulting from a reduction in domestic landings. Information on the imports of snapper and grouper species, either fresh or frozen, are available at:

https://www.fisheries.noaa.gov/foss/. However, information on the imports of greater amberjack are not available.

According to NMFS' foreign trade data,[31] snapper are not exported from the U.S. to other countries. Thus, the following describes the imports of fresh and frozen snapper products, which directly compete with domestic harvest of snapper species. All monetary estimates are in 2020 dollars. As shown in Table 3.4.1.8, imports of fresh snapper products were 30.6 million lbs product weight (pw) in 2016. They peaked at 32.8 million lbs pw in 2020, an increase of 6% relative to 2016. Total revenue from snapper imports increased from $97.3 million (2020 dollars) in 2016 to a five-year high of $110.7 million in 2019. The average price per pound for fresh snapper products was $3.24 from 2016-2020. Imports of fresh snapper products primarily originated in Mexico or Central America and primarily entered the U.S. through the port of Miami

Table 3.4.1.9. Annual pounds and value of fresh snapper imports and share of imports by country, 2016-2020.

	2016	2017	2018	2019	2020
Pounds of fresh snapper imports (product weight, million pounds)	30.6	31.2	30.5	32.8	32.4
Value of fresh snapper imports (millions $, 2020$)	97.3	95.0	99.3	110.7	108.9
Average price per lb (2020$)	$3.18	$3.05	$3.25	$3.38	$3.36
Share of Imports by Country					
Mexico	32.7	35.8	32.5	34.9	40.4
Nicaragua	15.6	15.4	17.0	14.6	15.1
Panama	14.0	14.8	16.6	13.9	11.0
All others	37.6	33.9	33.9	36.6	33.5

Source: NOAA Foreign Trade Query Tool, accessed 05/14/22

As shown in **Table 3.4.1.10**, imports of frozen snapper products were 14.4 million lbs product weight (pw) in 2016. They peaked at 15.9 million lbs pw in 2020, an increase of 10% relative to 2016. Total revenue from snapper imports increased from $40.9 million (2020 dollars) in 2016 to a five-year high of $46.4 million in 2019. The average price per pound for fresh snapper products was $2.94 from 2016-2020. Imports of snapper products primarily originated in Mexico or Central America and primarily entered the U.S. through the port of Miami.

[31] https://www.fisheries.noaa.gov/foss

Table 3.4.1.10. Annual pounds and value of frozen snapper imports and share of imports by country, 2016-2020.

	2016	2017	2018	2019	2020
Pounds of frozen snapper imports (product weight, million pounds)	14.4	12.8	12.2	11.4	15.9
Value of frozen snapper imports (millions $, 2020$)	40.9	36.7	36.1	35.2	46.4
Average price per lb (2020$)	$2.84	$2.86	$2.96	$3.09	$2.93
Share of Imports by Country					
Mexico	65.3	61.0	63.8	54.6	55.4
Nicaragua	7.8	11.0	11.3	6.8	5.4
Panama	9.3	7.9	6.9	13.5	10.3
All others	17.6	20.1	17.9	25.0	28.9

Source: NOAA Foreign Trade Query Tool, accessed 05/14/22

Groupers

According to NMFS' foreign trade data,[32] grouper are not exported from the U.S. to other countries. Thus, the following describes the imports of fresh and frozen grouper products which directly compete with domestic harvest of grouper species. As shown in Table 3.4.1.11, imports of fresh grouper products were 11.5 million lbs product weight (pw) in 2016. They peaked at 12.4.million lbs pw in 2018, but declined to 10.4 .million lbs pw by 2020. Total revenue from fresh grouper imports decreased from $51.0 million (2020 dollars) in 2016 to a five-year low of $10.4 million in 2020. The average price per pound for fresh snapper products was $4.29 from 2016-2020. Imports of fresh snapper products primarily originated in Mexico, Panama and Brazil.

Table 3.4.1.11. Annual pounds and value of fresh grouper imports and share of imports by country, 2016-2020.

	2016	2017	2018	2019	2020
Pounds of fresh Grouper imports (product weight, million pounds)	11.5	12.3	12.4	11.3	10.4
Value of fresh Grouper imports (millions $, 2020$)	51.0	53.5	54.9	50.9	39.0
Average price per lb (2020$)	$4.45	$4.36	$4.43	$4.50	$3.73
Share of Imports by Country					
Mexico	65.9	58.8	58.0	57.9	67.6
Panama	12.7	12.2	9.0	8.1	8.0
Brazil	4.9	10.1	15.9	16.9	12.3
All others	16.4	19.0	17.1	17.0	12.2

Source: NOAA Foreign Trade Query Tool, accessed 05/14/22

[32] https://www.fisheries.noaa.gov/foss/

As shown in Table 3.4.1.12, imports of frozen grouper products were 0.8 million lbs product weight (pw) in 2016. They peaked at 4.6.million lbs pw in 2018, but declined to 0.8 .million lbs pw by 2020. Total revenue from frozen grouper increased from $1.6 million (2020 dollars) in 2016 to $5.9 million in 2018, but a subsequent decline to $1.4 million in 2020. The average price per pound for frozen grouper products was $4.29 from 2016-2020. Imports of frozen grouper products primarily originated in Mexico, India, and Indonesia.

Table 3.4.1.12. Annual pounds and value of frozen grouper imports and share of imports by country, 2016-2020

	2016	2017	2018	2019	2020
Pounds of frozen Grouper imports (product weight, million pounds)	0.8	1.4	4.6	3.5	0.8
Value of frozen Grouper imports (millions $, 2020$)	1.6	2.0	5.9	4.6	1.4
Average price per lb (2020$)	$2.00	$1.40	$1.29	$1.32	$1.77
Share of Imports by Country					
Mexico	24.7	47.2	79.2	79.2	33.7
India	45.4	29.3	11.2	11.2	25.9
Indonesia	9.0	16.3	4.0	3.0	1.1
All others	20.8	7.2	5.5	6.5	39.3

Economic Impacts

The commercial harvest and subsequent sales and consumption of fish generates business activity as fishermen expend funds to harvest the fish and consumers spend money on goods and services, such as red grouper purchased at a local fish market and served during restaurant visits. These expenditures spur additional business activity in the region(s) where the harvest and purchases are made, such as jobs in local fish markets, grocers, restaurants, and fishing supply establishments. In the absence of the availability of a given species for purchase, consumers would spend their money on substitute goods and services. As a result, the analysis presented below represents a distributional analysis only; that is, it only shows how economic impacts may be distributed through regional markets and should not be interpreted to represent the impacts if these species are not available for harvest or purchase.

In addition to these types of impacts, economic impact models can be used to determine the sources of the impacts. Each impact can be broken down into direct, indirect, and induced economic impacts. "Direct" economic impacts are the results of the money initially spent in the study area (e.g., country, region, state, or community) by the fishery or industry being studied. This includes money spent to pay for labor, supplies, raw materials, and operating expenses. The direct economic impacts from the initial spending create additional activity in the local economy, i.e., "indirect" economic impacts. Indirect economic impacts are the results of business-to-business transactions indirectly caused by the direct impacts. For example, businesses initially benefiting from the direct impacts will subsequently increase spending at other local businesses. The indirect economic impact is a measure of this increase in business-to-business activity, excluding the initial round of spending which is included in the estimate of direct impacts.

"Induced" economic impacts are the results of increased personal income caused by the direct and indirect economic impacts. For example, businesses experiencing increased revenue from the direct and indirect impacts will subsequently increase spending on labor by hiring more employees, increasing work hours, raising salaries/wage rates, etc. In turn, households will increase spending at local businesses. The induced impact is a measure of this increase in household-to-business activity.

Estimates of the U.S. average annual business activity associated with the commercial harvest of Gulf greater amberjack were derived using the model developed for and applied in NMFS (2018)[33] and are provided in Table 3.4.1.13. Specifically, these impact estimates reflect the expected impacts from average annual gross revenues generated by landings of Gulf greater amberjack from 2016 through 2020. This business activity is characterized as jobs (full time equivalents), income impacts (wages, salaries, and self-employed income), value-added impacts (the difference between the value of goods and the cost of materials or supplies), and output impacts (gross business sales). Income impacts should not be added to output (sales) impacts because this would result in double counting.

The results provided should be interpreted with caution. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species. Separate models specific to individual species such as greater amberjack are not available. Between 2016 and 2020, landings of Gulf greater amberjack resulted in approximately $662,000 (2020$) in gross revenue on average. In turn, this revenue generated employment, income, value-added, and output impacts of 82 jobs, $2.4 million, $13.4 million, and $6.6 million per year, respectively, on average.

[33] A detailed description of the input/output model is provided in NMFS (2011).

Table 3.4.1.13 Average annual economic impacts in the commercial sector of the Gulf greater amberjack fishery. All monetary estimates are in thousands of 2020 dollars and employment is measured in full-time equivalent jobs**.**

Harvesters	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	14	2	3	20
Income impacts	357	66	160	584
Total value-added impacts	381	239	275	894
Output Impacts	662	538	533	1,733
Primary dealers/processors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	3	1	2	6
Income impacts	117	107	102	326
Total value-added impacts	124	137	191	453
Output impacts	375	283	374	1,032
Secondary wholesalers/distributors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	1	0	1	3
Income impacts	69	21	73	163
Total value-added impacts	74	35	125	233
Output impacts	186	68	243	497
Grocers	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	6	1	1	8
Income impacts	143	47	72	262
Total value-added impacts	152	77	121	350
Output impacts	244	124	238	607
Restaurants	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	37	2	6	46
Income impacts	573	174	328	1,075
Total value-added impacts	611	311	553	1,475
Output impacts	1,117	486	1,092	2,695
Harvesters and seafood industry	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	62	7	14	82
Income impacts	1,259	416	735	2,410
Total value-added impacts	1,343	798	1,265	3,406
Output impacts	2,585	1,500	2,480	6,564

Recreational Sector

The recreational sector is comprised of the private and for-hire modes. The private mode includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire mode is composed of charter boats and headboats (also called party boats). Charter boats generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person. The type of service, from a vessel- or passenger-size perspective, affects the flexibility to search different fishing locations during the course of a trip and target different species since larger concentrations of fish are required to satisfy larger groups of anglers.

Landings

This section contains landings data from the Southeast Fisheries Science Center (SEFSC) Marine Recreational Information Program (MRIP) ACL monitoring data set, with the addition of landings estimates provided by the Louisiana Department of Wildlife and Fisheries (LDWF), and the Texas Parks and Wildlife Department (TPWD).

Recreational greater amberjack landings peaked in 2018, and declined overall in subsequent years, however there was an increase in landings in 2020 from 2019 (Table 3.4.2.1). Landings in 2021 were 36% lower relative to 2018. The distribution of landings between modes was volatile during this time period. The majority of landings oscillated between private and charter modes from 2018-2021. Private vessels on average from 2018-2021 accounted for 57% of greater amberjack landings, charter vessels 40%, and headboats making up the remaining 3%. No landings for greater amberjack were recorded shore modes. The majority of landings on average occurred in Florida (57%) (Figure 3.4.2.1). Waves 4 and 5, which include the months of July-August and September-October, accounted for the majority of landings on average from 2018-2021 (Figure 3.4.2.2).

Table 3.4.2.1. Recreational landings (lbs ww) and percent distribution of greater amberjack across all states by mode for 2018-2021.

	Landings (pounds ww)				Percent Distribution		
Year	**Charter vessel**	**Headboat**	**Private**	**Total**	**Charter vessel**	**Headboat**	**Private**
2018	646,999	71,400	1,811,433	2,529,832	0.26	0.03	0.72
2019	542,936	33,410	445,019	1,021,366	0.53	0.03	0.44
2020	450,449	31,626	1,233,019	1,715,094	0.26	0.02	0.72
2021	683,816	28,076	530,682	1,242,575	0.55	0.02	0.43
AVG	**581,050**	**41,128**	**1,005,038**	**1,627,217**	**0.40**	**0.03**	**0.57**

Source: SEFSC MRIP ACL data set (April 2022).

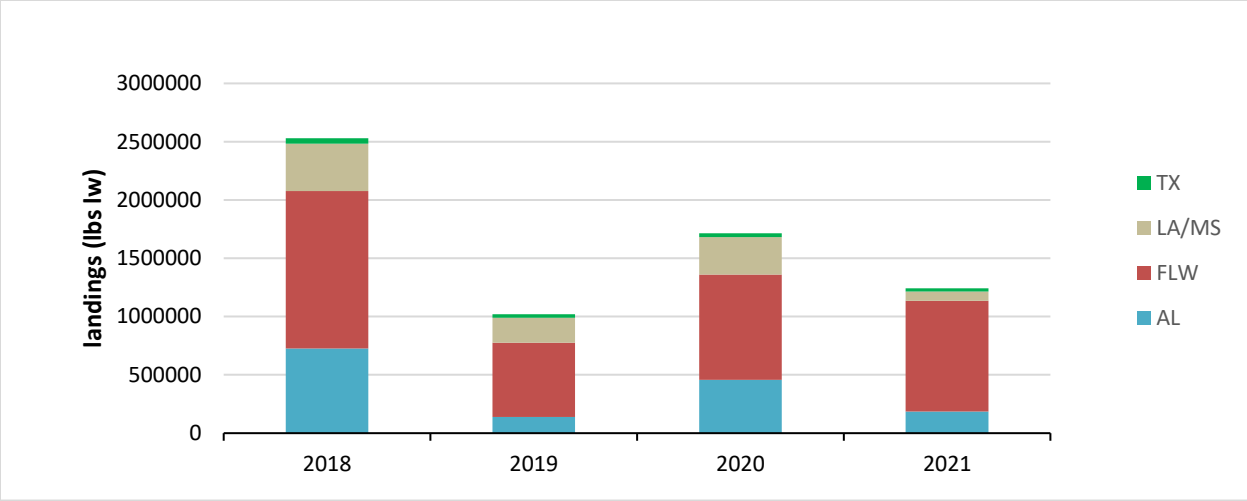

Figure 3.4.2.1. Recreational landings of Gulf greater amberjack by state.*
Source: SEFSC MRIP ACL data set (April 2022).
*Louisiana and Mississippi are combined here to align with the way headboat landings were reported.

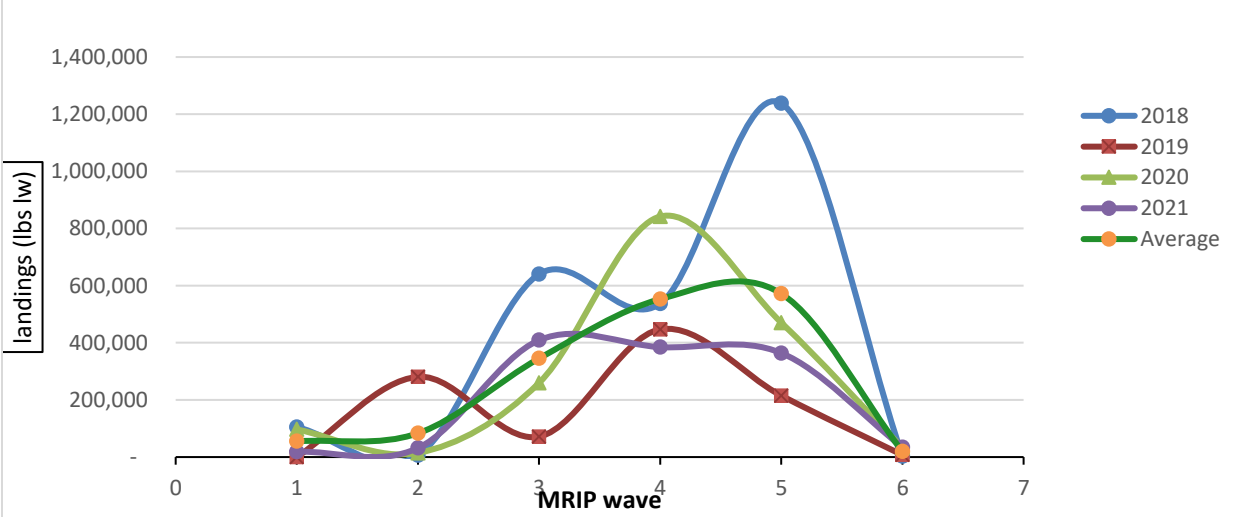

Figure 3.4.2.2. Recreational landings of Gulf greater amberjack by wave.
Source: SEFSC MRIP ACL data set (April 2022).

Angler Effort

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

- Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or the second primary target for the trip. The species did not have to be caught.

- Catch effort - The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.
- Total recreational trips - The total estimated number of recreational trips in the Gulf, regardless of target intent or catch success.

Other measures of effort are possible, such as directed trips (the number of individual angler trips that either targeted or caught a particular species). Estimates of greater amberjack target or catch effort for additional years, and other measures of directed effort, are available at https://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/queries/index

Tables 3.4.2.2 – 3.4.2.5 describe the recreational target and catch trips for greater amberjack in the Gulf from 2018-2021. There are no catch or target trips for the shore mode for greater amberjack in the Gulf. Private vessels represent more than 89% of target effort in the recreational sector. The majority of target effort occurs by private vessels in Florida, followed by Alabama's private vessel target effort. On average, May and June had the greatest target effort followed by July and August. These include two opening months are when the federal harvest season is opened for greater amberjack in the Gulf. It should be noted, that while the season is closed to harvest from Nov-April and June-July, target trips are greater than zero indicating that amberjack are sought as a catch and release fish as well.

Similarly, private vessels are also responsible for the vast majority of catch effort for greater amberjack (77%). Catch effort by charter vessels represents about 23% of the total catch effort. Similarly, private vessels in Florida account for the majority of catch effort for greater amberjack (51%). However, relatively significant amounts of catch effort also occur in Alabama's private vessel fishery (20%), and Florida's charter fishery (18%). As expected, the trends in catch effort mimic the trends in landings, with the peak occurring in 2018, declines thereafter, and a significant decline in 2021. The significant decline in 2019 was most noticeable for private vessels in Florida.

Table 3.4.2.2. Greater Amberjack recreational target trips, by mode and state*, 2018-2021

Mode	Year	Mississippi	Alabama	Florida	Louisiana	Total
Charter	2018	0	1,245	18,392	4,117	23,754
	2019	0	424	5,373	2,187	7,984
	2020	0	1,610	13,319	1,083	16,012
	2021	0	1,600	6,964	1,201	9,765
	Average	0	1,220	11,012	2,147	14,379
Private						
	2018	4,750	25,486	161,835	7,273	199,344
	2019	2,542	26,557	21,375	6,196	56,670
	2020	25,762	42,032	82,585	4,394	154,773
	2021	1,615	14,930	38,444	2,831	57,820
	Average	8,667	27,251	76,060	5,174	117,152
All						
	2018	4,750	26,731	180,227	11,390	223,098
	2019	2,542	26,981	26,748	8,383	64,654
	2020	25,762	43,642	95,904	5,477	170,785
	2021	1,615	16,530	45,408	4,032	67,585
	Average	8,667	28,471	87,072	7,321	131,531

Table 3.4.2.3. Greater Amberjack recreational catch trips, by mode and state 2018-2021

Mode	Year	Mississippi	Alabama	Florida	Louisiana	Texas	Total
Charter	2018	0	5,211	27,832	1,143	1,143	35,329
	2019	0	4,631	36,633	467	467	42,198
	2020	0	4,171	21,755	1,997	1,997	29,920
	2021	0	4,036	22,824	3,069	3,069	32,998
	Average	0	4,512	27,261	1,669	1,669	35,111
Private							
	2018	2,788	42,812	132,000	9,267	1,251	188,118
	2019	2,865	11,931	88,125	7,797	1,354	112,072
	2020	5,323	43,519	72,945	3,228	204	125,219
	2021	4,152	26,173	17,690	5,067	678	53,760
	Average	3,782	31,109	77,690	6,340	872	119,792
All							
	2018	2,788	48,023	159,832	10,410	2,394	223,447
	2019	2,865	16,562	124,758	8,264	1,821	154,270
	2020	5,323	47,690	94,700	5,225	2,201	155,139
	2021	4,152	30,209	40,514	8,136	3,747	86,758
	Average	3,782	35,621	104,951	8,009	2,541	154,904

Sources: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreationalfishing-data-downloads. Effort estimates for Texas are from the Texas Parks and Wildlife Department's Marine Sport-Harvest Monitoring Program and assumed equivalent to MRIP-FES estimates. Target effort estimates for most reef fish species in Texas are unavailable. Louisiana recreational effort estimates came from the Louisiana Department of Wildlife and Fisheries Recreational Creel Survey. Headboat target effort is unavailable.

* No recorded target trips in TX.

Table 3.4.2.4. Greater Amberjack recreational target trips, by wave and mode* from 2018-2021

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov-Dec)	Total
Charter							
2018	1,283	6,506	8,932	2,701	3,892	441	23,755
2019	765	228	0	1,937	5,054	0	7,984
2020	2,051	3,464	2,935	7,128	434	0	16,012
2021	439	0	5,019	3,371	937	0	9,766
Average	1,135	2,550	4,222	3,784	2,579	110	14,379
Private							
2018	16,713	4,802	93,158	28,489	49,921	6,261	199,344
2019	4,702	0	2,881	33,739	15,348	0	56,670
2020	1,391	3,467	57,964	49,458	42,492	0	154,772
2021	0	0	23,076	26,177	8,567	0	57,820
Average	5,702	2,067	44,270	34,466	29,082	1,565	117,152
All							
2018	17,996	11,308	102,090	31,190	53,813	6,702	223,099
2019	5,467	228	2,881	35,676	20,402	0	64,654
2020	3,442	6,931	60,899	56,586	42,926	0	170,784
2021	439	0	28,095	29,548	9,504	0	67,586
Average	6,836	4,617	48,491	38,250	31,661	1,676	131,531

Sources: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreationalfishing-data-downloads. Effort estimates for Texas are from the Texas Parks and Wildlife Department's Marine Sport-Harvest Monitoring Program and assumed equivalent to MRIP-FES estimates. Target effort estimates for most reef fish species in Texas are unavailable. Louisiana recreational effort estimates came from the Louisiana Department of Wildlife and Fisheries Recreational Creel Survey. Headboat target effort is unavailable.

*No reported shore trips

Table 3.4.2.5. Greater Amberjack recreational catch trips, by wave and mode* from 2018-2021

	1 (Jan-Feb)	2 (Mar-Apr)	3 (May-Jun)	4 (Jul-Aug)	5 (Sep-Oct)	6 (Nov-Dec)	Total
Charter							
2018	709	2,187	16,074	13,515	8,355	0	40,840
2019	2,236	11,812	10,357	5,523	10,245	4,179	44,352
2020	355	1,412	11,014	13,471	2,257	622	29,131
2021	1,752	1,678	11,942	9,982	4,811	1,262	31,427
Average	1,263	4,272	12,347	10,623	6,417	1,516	36,438
Private							
2018	7,742	5,541	61,321	67,446	53,426	11,175	206,651
2019	15,354	15,261	10,766	60,803	20,303	5,177	127,664
2020	13,065	6,050	28,820	38,394	41,386	3,961	131,676
2021	2,748	4,905	19,966	19,208	15,438	1629	63,894
Average	9,727	7,939	30,218	46,463	32,638	5,486	132,471
All							
2018	7,742	5,541	54,519	57,538	51,854	10,923	188,117
2019	15,354	15,261	10,400	46,253	19,625	5,177	112,070
2020	13,065	4,902	27,618	34,858	40,816	3,961	125,220
2021	2,748	4,403	12,410	18,348	15,308	543	53,760
Average	9,727	7,527	26,237	39,249	31,901	5,151	119,792

Sources: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreationalfishing-data-downloads. Effort estimates for Texas are from the Texas Parks and Wildlife Department's Marine Sport-Harvest Monitoring Program and assumed equivalent to MRIP-FES estimates. Target effort estimates for most reef fish species in Texas are unavailable. Louisiana recreational effort estimates came from the Louisiana Department of Wildlife and Fisheries Recreational Creel. Headboat target effort is unavailable.
*No reported shore trips

Similar analysis of recreational effort is not possible for the headboat mode in the Gulf 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 snapper grouper trips by intent.

Headboat angler days declined overall across the Gulf States from 2018 through 2020, but increased by about 9% in 2021, relative to 2018 (Table 3.4.2.6). Texas, however, saw little decline in headboat angler days from 2018-2020, and had a large increase in 2021. On average (2018 through 2021), Florida accounted for the majority of headboat angler days reported, followed by Texas and Alabama; whereas, Mississippi and Louisiana combined, accounted for only a small percentage (Table 3.4.2.7). Headboat effort in terms of angler days for the entire Gulf was concentrated most heavily during the summer months of June through August on average (2018 through 2021; Table 3.4.2.7).

Table 3.4.2.6. Gulf headboat angler days and percent distribution by state (2018 through 2021).

	Angler Days				Percent Distribution			
	FL	**AL**	**MS-LA***	**TX**	**FL**	**AL**	**MS-LA**	**TX**
2018	171,996	19,851	3,235	52,160	69.6%	8.0%	1.3%	21.1%
2019	161,564	18,607	2,632	52,456	68.7%	7.9%	1.1%	22.3%
2020	126,794	13,091	1,728	51,498	65.7%	6.8%	0.9%	26.7%
2021	181,632	13,844	3,197	71,344	67.3%	5.1%	1.2%	26.4%
Average	160,497	16,348	2,698	56,865	67.8%	7.0%	1.1%	24.1%

Source: NMFS SRHS (February, 2022).

*headboat data from Mississippi and Louisiana are combined for confidentiality purposes.

Table 3.4.2.7. Gulf headboat angler days and percent distribution by month (2018 – 2021).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Headboat Angler Days											
2018	5,524	13,694	20,762	17,584	16,876	54,251	53,304	24,819	13,235	10,633	8,183	8,377
2019	2,330	12,819	21,796	16,299	18,271	46,046	47,594	24,212	11,369	13,687	10,389	10,447
2020	8,147	10,906	11,426	385	11,130	43,930	42,021	20,647	12,190	14,497	8,710	9,122
2021	6,871	8,584	21,301	17,746	22,019	51,773	55,201	24,978	15,768	20,446	12,117	13,213
Avg	5,718	11,501	18,821	13,004	17,074	49,000	49,530	23,664	13,141	14,816	9,850	10,290
	Percent Distribution											
2018	2.2%	5.5%	8.4%	7.1%	6.8%	21.9%	21.6%	10.0%	5.4%	4.3%	3.3%	3.4%
2019	1.0%	5.4%	9.3%	6.9%	7.8%	19.6%	20.2%	10.3%	4.8%	5.8%	4.4%	4.4%
2020	4.2%	5.6%	5.9%	0.2%	5.8%	22.7%	21.8%	10.7%	6.3%	7.5%	4.5%	4.7%
2021	2.5%	3.2%	7.9%	6.6%	8.2%	19.2%	20.4%	9.3%	5.8%	7.6%	4.5%	4.9%
Avg	2.5%	5.0%	7.9%	5.2%	7.1%	20.9%	21.0%	10.1%	5.6%	6.3%	4.2%	4.4%

Source: NMFS SRHS (Feb, 2022)

Permits

There are no specific federal permitting requirements for recreational anglers to fish for or harvest greater amberjack. The same is true of private recreational vessel owners. Instead, private 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. As a result, it is not possible to identify with available data how many individual anglers or private recreational vessels would be expected to be affected by the actions in this amendment.

Charter vessel/headboat vessels in the Gulf are required to have a limited access charter vessel/headboat for Reef fish permit (Gulf RCG for-hire permit) to fish for or possess coastal reef fish species. The total number of valid or renewable RCG permits has been relatively stable with less than 1% change in valid or renewable RCG permits from year to year (Table 3.4.2.8).

Although the 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 the selection criteria used by the SRHS and is selected to report by the Science Research Director of the SEFSC, it is determined to operate primarily as a headboat and is required to submit harvest and effort information to the SRHS.

Table 3.4.2.8. Number of valid or renewable RCG permits, 2016-2020.

Year	Number of Permits
2016	1282
2017	1280
2018	1279
2019	1277
2020	1289

Source: NMFS SERO SF Access Permits Database.

Economic Value

Economic value can be measured in the form of consumer surplus (CS) per additional greater amberjack 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). There is no direct available estimate of CS for greater amberjack, but other estimates can serve as close proxies. Haab et al. (2012) used data from the 2000 MRFSS southeast intercept survey combined with the economic add-on to produce estimated values of the CS per fish for a second small game (which includes greater amberjack) and snappers (which includes the amberjack genus) kept on a trip are approximately $30, and $14, respectively (2020 dollars). Carter, Lovell and Liese (2020) used a 2014 mail survey of recreational anglers fishing in the Gulf of Mexico (GOM) to produce values of the CS for an additional fish kept. Carter, Lovell and Liese 2020 estimated for a snapper species the value of one additional snapper kept was $56 (2020 dollars). Averaging the three estimates from these two studies yields a proxy of the value for CS of greater amberjack at $33 (2020) dollars.

Economic value for the for-hire component of the recreational sector can be measured in many ways. According to Savolainen et al. (2012), the average charter vessel operating in the Gulf is estimated to receive approximately $91,000 (2020 dollars) in gross revenue and $27,000 in net income (gross revenue minus variable and fixed costs) annually. The average headboat is estimated to receive approximately $275,000 (2020 dollars) in gross revenue and $80,000 in net income annually. More recent estimates of average annual gross revenue for Gulf headboats are provided in Abbott and Willard (2017) and D. Carter (pers. comm., 2018). Abbott and Willard (2017) suggest that Savolainen, et al.'s estimate of average annual gross revenue for headboats may be an underestimate, as data in the former suggest that average gross revenue in 2009 for the vessels in their sample was about $486,000 (2020 dollars). Further, their data suggest average annual gross revenue per vessel had increased to about $587,000 (2020 dollars) by 2014. However, Abbott and Willard's estimates are based on a sample of 17 headboats that chose to participate in the headboat Collaborative Program in 2014, while Savolainen, et al.'s are based on a random sample of 20 headboats. The headboats that participated in the Collaborative may be economic highliners, in which case Abbott and Willard's estimates would overestimate average annual gross revenue for Gulf headboats. Carter (2018) recently estimated that average annual gross revenue for Gulf headboats were approximately $432,853 (2020 dollars) in 2017. This estimate is likely the

best current estimate of annual gross revenue for Gulf headboats, as it is based on a relatively large sample of 63 boats, or more than 90% of the active fleet, and is more recent.

However, gross revenues overstate the annual economic value and profits generated by for-hire vessels. 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 revenue, costs, and trip net revenue trips taken by headboats and charter vessels in 2017 are available from Souza and Liese (2019). They also provide estimates of trip net cash flow per angler trip, which approximate PS per angler trip. According to Table 3.4.2.8, after accounting for transactions fees, supply costs, and labor costs, net revenue per trip was 42% of revenue for Gulf charter vessels and 54% of revenue for Southeast headboats, or $789 and $1,834 (2020 dollars), respectively. Given the respective average number of anglers per trip for each fleet, PS per trip is estimated to be $143 for charter vessels and $65 for headboats.

Table 3.4.2.9. Trip economics for offshore trips by Gulf charter vessels and Southeast headboats in 2017 (2020$).

	Gulf Charter Vessels	Southeast Headboats
Revenue	100%	100%
Transaction Fees (% of revenue)	3%	6%
Supply Costs (% of revenue)	27%	19%
Labor Costs (% of revenue)	27%	22%
Net Revenue per trip including Labor costs (% of revenue)	42%	54%
Net Revenue per Trip	$790	$1,837
Average # of Anglers per Trip	5.5	28.2
Trip Net Cash Flow per Angler Trip	$144	$65

Trip net revenue (TNR), which is the return used to pay all labor wages, returns to capital. When TNR is divided by the number of anglers on a trip, it represents cash flow per angler (CFpA). The estimated CFpA value for an average Gulf charter angler trip is $144 (2020 dollars) and the estimated CFpA value for an average Gulf headboat angler trip is $65 (Souza and Liese 2019). Estimates of CFpA for all individual Reef Fish species target trips, in particular, are not available.

Business Activity

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

Estimates of the business activity (economic impacts) associated with recreational angling for Gulf greater amberjack were calculated using average trip-level impact coefficients derived from the 2018 Fisheries Economics of the U.S. report (NMFS 2021) and underlying data provided by the National Oceanic and Atmospheric Administration (NOAA) Office of Science and Technology. Economic impact estimates in 2016 dollars were adjusted to 2020 dollars using the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

Business activity (economic impacts) for the recreational sector is characterized in the form of jobs (full- and part-time), income impacts (wages, salaries, and self-employed income), output impacts (gross business sales), and value-added impacts (contribution to the GDP in a state or region). Estimates of the average annual economic impacts (2018–2021) resulting from Gulf greater amberjack charter and private vessel target trips are provided in Table 3.4.2.10. To calculate the multipliers from Table 3.4.2.10, simply divide the desired impact measure (sales impact, value-added impact, income impact or employment) associated with a given state by the number of target trips for that state.

The estimates provided in Table 3.4.2.10 only apply at the state-level. Addition of the state-level estimates to produce a regional (or national) total may underestimate the actual amount of total business activity, because state-level impact multipliers do not account for interstate and interregional trading. It is also important to note that these economic impacts estimates are based on trip expenditures only and do not account for durable expenditures. Durable expenditures cannot be reasonably apportioned to individual species. As such, the estimates provided in Table 3.4.2.10 may be considered a lower bound on the economic activity associated with those trips that targeted greater amberjack.

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

Table 3.4.2.10. Estimated average annual economic impacts (2018-2021) from Gulf charter and private vessel greater amberjack target trips, by state,* using state-level multipliers. All monetary estimates are in 2020 dollars in thousands.

	FL	AL	MS	LA
Charter Mode				
Target Trips	11,012	1,220	0	2,147
Value Added Impacts	$3,853	$508	$0	$1,018
Sales Impacts	$6,470	$924	$0	$1,913
Income Impacts	$2,251	$290	$0	$600
Employment (Jobs)	60	10	0	22
Private/Rental Mode				
Target Trips	76,060	27,251	8,667	5,714
Value Added Impacts	$2,742	$1,232	$189	$853
Sales Impacts	$4,250	$1,906	$314	$1,459
Income Impacts	$1,439	$479	$100	$461
Employment (Jobs)	39	18	3	11
All Modes				
Target Trips	87,072	28,471	8,667	7,861
Value Added Impacts	$6,595	$1,740	$189	$1,871
Sales Impacts	$10,720	$2,830	$314	$3,372
Income Impacts	$3,690	$769	$100	$1,061
Employment (Jobs)	98	28	3	34

Source: Effort data from MRIP, LDWF LA Creel; economic impact results calculated by NMFS SERO using NMFS (2021) and underlying data provided by the NOAA Office of Science and Technology.
* There are no target trips for Texas
Note: Headboat information is unavailable

3.5 Description of the Social Environment

This section describes select social, demographic, and geographic aspects of the Gulf greater amberjack fishery addressed by the amendment, providing essential background for social effects analysis in Chapter 4. Trends in commercial and recreational landings and permit issuance are provided to aid in describing the distribution of fishing effort, with emphasis on identifying Gulf communities where fleets are most deeply engaged in the greater amberjack fishery. Quantitative description is limited to the 2016 through 2020 time-series, with emphasis on data year 2020. Description of community-level involvement in the sectors of interest is provided to meet the

requirements of National Standard 8 of the Magnuson-Stevens Fishery Management and Conservation Act, which calls for examination of linkages between fishery resources and human communities when regulatory changes are under consideration. Finally, this section addresses environmental justice concerns, and identification of community-level social vulnerabilities to prospective regulatory change.

3.5.1 Greater Amberjack Commercial Sector

As a member of the Carangid family of fishes (Carangidae or jacks), greater amberjack are considered a reef-associated species. Mature individuals exhibit affinity with wrecks, reefs, and other bathymetric features at approximate depths of between 60 and 235 feet (GMFMC 2022). This affinity has implications for the location, depth, and manner in which captains and crew pursue the species. Participants in the commercial sector of the greater amberjack fishery may allowably deploy vertical hook and line gear, bottom longline gear, or commercial dive gear (spear and powerhead gear). Circle hooks must be used, and a dehooking device is required for use onboard (GMFMC 2022). Greater amberjack are often landed in conjunction with other reef fish species (Cummings and McLellan 2000). The behaviors of greater amberjack, ecological indications of their presence, and specific locations where the fish and marketable adjacent species are known or thought likely to be located, are important and often carefully guarded forms of information among commercial harvesters and social networks of harvesters.

Greater Amberjack Commercial Landings by Gulf State

The geographic distribution of greater amberjack landings provide an indication of states and communities where harvest of the species is important in social and economic terms. During 2020, 75% of the greater amberjack resource was landed on a commercial basis at ports in Florida, followed by 14.5% at ports in Louisiana, 5.4% at ports in Texas, and 4.9% at ports in Alabama. Less than 1% of the greater amberjack resource was landed at ports in Mississippi during 2020. Commercial landings of greater amberjack at Florida ports consistently exceeded landings at ports in each of the other Gulf states during the 2016 through 2020 time-series. The second-largest volume of commercial landings of greater amberjack tends to alternate between ports in Alabama and Louisiana, with Alabama landings exceeding those of Louisiana in 2017, 2018, and 2019 (SEFSC Community ALS File, May 2022).

Distribution of Gulf Commercial Reef Fish Permits

Captains must posses a Gulf of Mexico commercial reef fish permit in order to harvest greater amberjack and other reef fish species on a commercial basis. The distribution of such permits therefore indicates the states and communities from which participants in the fishery may operate. At 81.1%, most permits were issued to residents or persons with mailing addresses in Florida during 2020, followed by 8% in Texas, 4.7% in both Louisiana and Alabama, and less than 1% in Mississippi. Single permits were issued during 2020 to persons with mailing addresses in West Virginia, Georgia, South Carolina, New York, and California. The state-level distribution of Gulf commercial reef fish permits varies little over the time-series, with the vast majority of permits consistently held for use by participants in West Florida. As depicted in

Table 3.5.1, numerous commercial reef fish permits were held by captains operating from the communities of Panama City and Key West during 2020 (NMFS SERO Sustainable Fisheries (SF) Access permits database).

Table 3.5.1 Distribution of commercial reef fish permits among the top permit-holding communities in the Gulf of Mexico: calendar year 2020.

State	Leading Communities	Number of Permits in 2020
Florida	Panama City	72
Florida	Key West	63
Florida	Destin	40
Texas	Galveston	37
Florida	Madeira Beach	31
Florida	Cortez	26
Florida	Tarpon Springs	25
Florida	Apalachicola	20
Florida	Pensacola	19
Florida	St. Petersburg	16
Florida	Clearwater	14
Alabama	Dauphin Island	13
Florida	Naples	13
Florida	Steinhatchee	11
Florida	Hernando Beach	11
Florida	Indian Shores	10
Florida	Seminole	10
Florida	Key Largo	9
Florida	Panama City Beach	9
Florida	Crystal River	9
Louisiana	Venice	9
Florida	Hudson	9
Texas	Freeport	8
Florida	Redington Shores	8

Source: NMFS SERO Sustainable Fisheries (SF) Access permits database.

Commercial fishery participants who harvest greater amberjack using bottom longline gear must possess a Gulf reef fish longline endorsement (LLE). During 2020 and throughout the 2016-2020 time-series, the greatest proportion of the 62 allotted LLEs were held by commercial operators based in the Florida community of Madeira Beach, followed closely by those from Cortez, Florida.

Regional Quotient of Gulf Commercial Greater Amberjack Landings

Figures 3.5.1 and 3.5.2 respectively depict the distribution of commercial landings and ex-vessel value of landings among the fifteen Gulf communities with the greatest share of greater amberjack landings during the period 2016 through 2020. Each distribution is expressed as a regional quotient, or the share of community landings and ex-vessel values divided by landings and values for the overall region. Communities are presented based on a ranking of average

landings and average values over the time-series. As can be discerned from Figure 3.5.1, commercial participants based in Key Largo collectively account for the greatest proportion of community-specific commercial greater amberjack landings during 2020 and throughout the time-series. It must be noted, however, that fishing effort undertaken by captains operating from Key Largo cannot readily be ascribed specifically to the Atlantic or Gulf side of Florida, while participants operating from Bayou LaBatre, Alabama, and Destin, Florida very likely do harvest primarily in Gulf waters. When considered in relation to Table 3.5.1 above, the data suggest that harvest of greater amberjack is relatively extensive in some communities despite a limited local pool of permit holders.

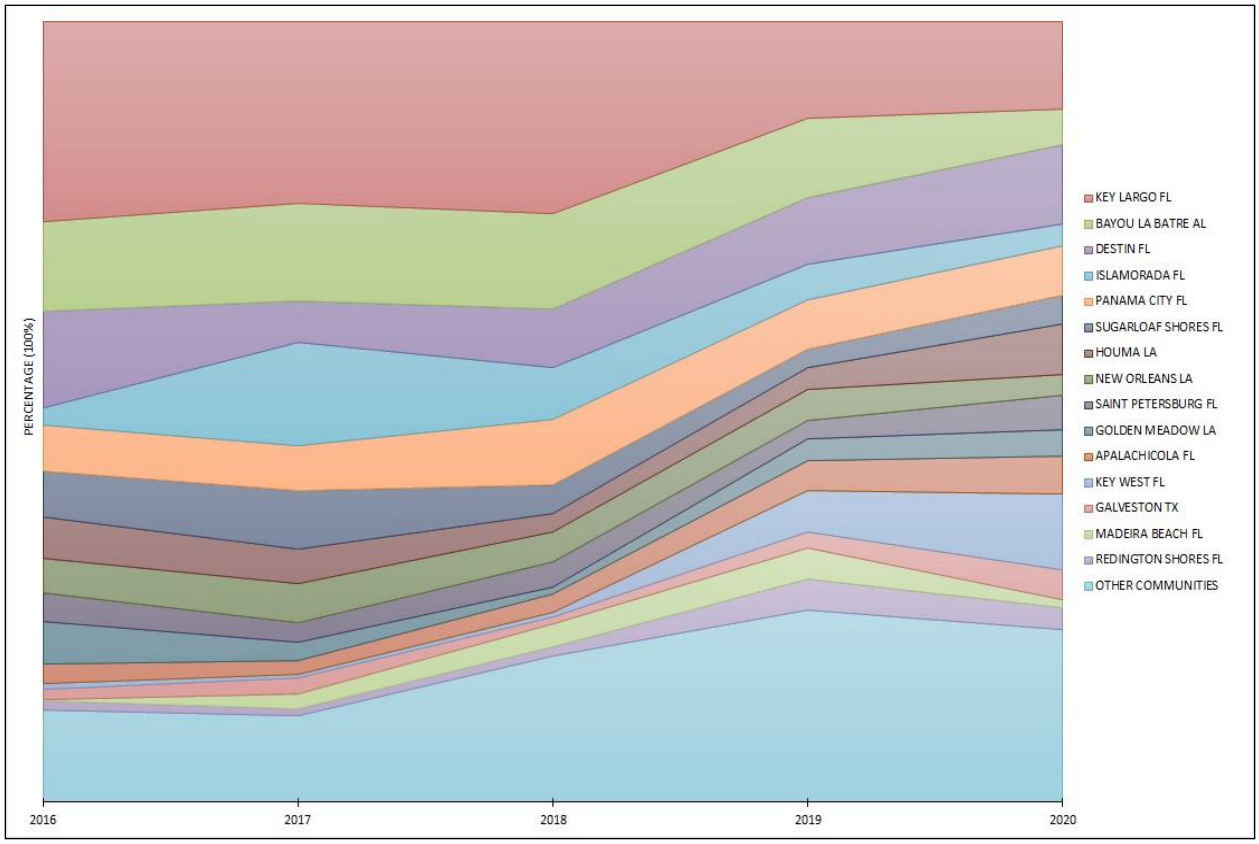

Figure 3.5.1 Distribution of regional *landings* among the top Gulf of Mexico commercial greater amberjack landings communities: 2016 through 2020.
Source: SEFSC, Community ALS Data File

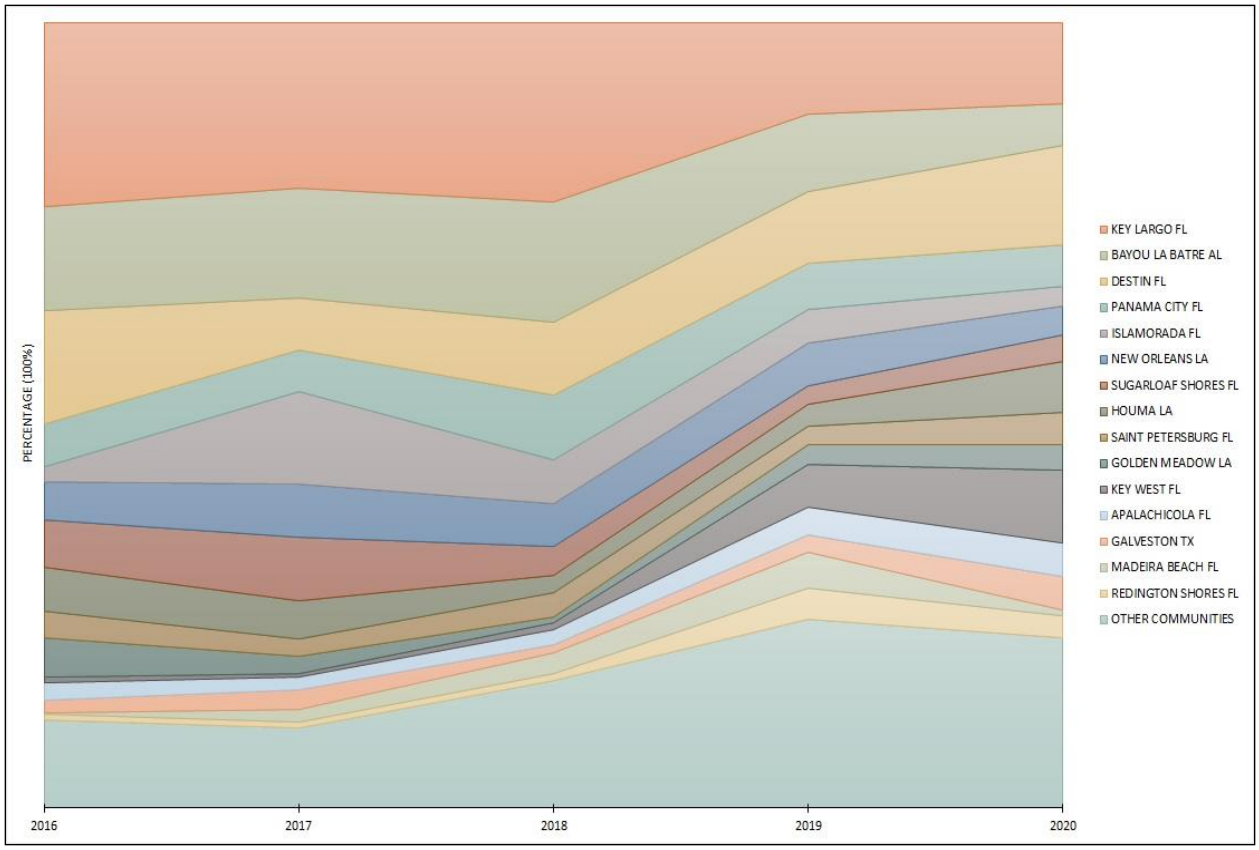

Figure 3.5.2 Distribution of regional *value* among the top Gulf of Mexico commercial greater amberjack landings communities: 2016 through 2020.
Source: SEFSC, Community ALS Data File

Measures of Community Engagement and Reliance

Figure 3.5.3 below provides measures of engagement and reliance for communities with the greatest average percentage of commercial greater amberjack landings during the time-series. As can be discerned from the graphic, Key West, FL and Bayou LaBatre, AL register particularly high scores in terms of overall engagement in Gulf of Mexico commercial fisheries. The Florida communities of Panama City and St. Petersburg; the Louisiana communities of Houma, New Orleans, and Golden Meadow; and the Texas community of Galveston also score above the one standard deviation threshold for engagement in the region's commercial fisheries. The measure of engagement provided here is a generalizable composite indicator based on: (a) pounds of fish landed by the local commercial fleets, (b) associated ex-vessel revenue, and (c) the number of commercial fishery participants and seafood dealers present in a given community.

Readers may consult Jacob et al. (2013), Jepson and Colburn (2013), and Hospital and Leong 2021 for discussion of the underlying rationale and approach for using indicators to assess local engagement in and reliance on regional marine fisheries. The measure of reliance used here incorporates the same variables noted above, divided by the total local population figure. Both measures are useful means for indicating where any prospective effects of greater amberjack management actions are likely to be experienced. Notably, none of the communities exceed the

one standard deviation threshold for *reliance* on commercial fisheries, suggesting local economic alternatives to the fishing and seafood industries. Of note, the community of Bayou LaBatre does exceed the .5 standard deviation threshold for reliance on regional commercial fisheries.

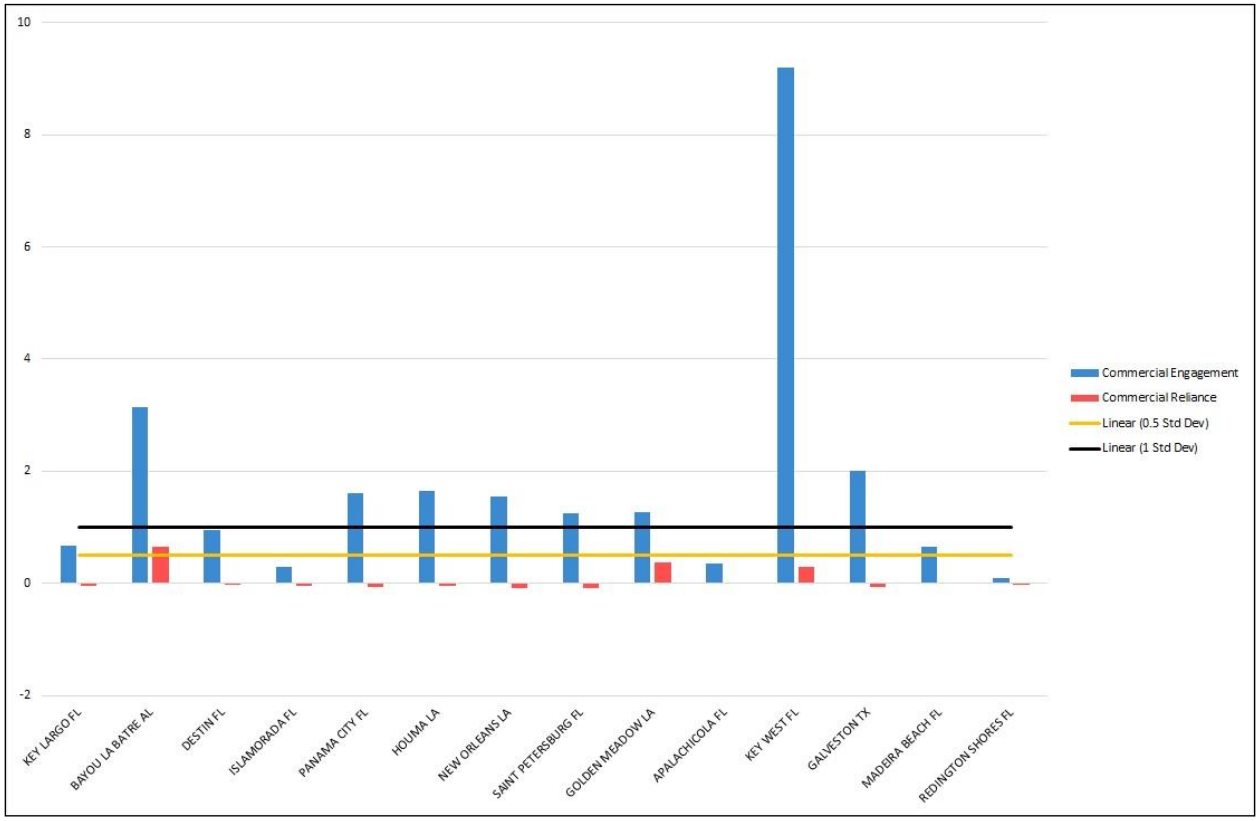

Figure 3.5.3 Measures of engagement and reliance among Gulf communities with the greatest volume of commercial greater amberjack landings during 2020.
Source: SERO, Community Social Vulnerability Indicators Database

3.5.2 Greater Amberjack Recreational Sector

The jacks, and perhaps especially greater amberjack, are widely known as powerful fish that can test an angler's fishing gear and endurance. As such, greater amberjack is an increasingly popular target species among for-hire captains and their patrons, and among recreational anglers who operate their own vessels. A variety of approaches are used to pursue the species, including but not limited to drifting with cut or live bait suspended at appropriate depths in the water column, vertical jigging, and trolling with various types of lures rigged to planers that can penetrate the water column to the appropriate depth. Greater amberjack behavior, ecological cues indicating their presence, and specific locations where the fish and adjacent species of interest are likely to be found, comprise important forms of information among for-hire captains, private sector participants, and social networks thereof. Most for-hire captains strive to enable a positive experience for their patrons irrespective of landings. Charter patrons may retain one fish per person per day providing that its fork length is equal to or greater than 34 inches.

Based on the historic description of recreational fishing for greater amberjack in the Gulf region provided by Cummings and McLellan (2000), most recreational landings of the species occur in the federal jurisdiction waters of the Gulf. The authors suggest that a surge in recreational pursuit of greater amberjack transpired during the late 1990s, following the gradual emergence of a St. Petersburg-based fleet of charter vessels with the capacity to undertake single-day trips to distant offshore fishing grounds (Cummings and McLellan 2000). The trend toward use of technologically efficient charter and private recreational vessels continues to the present-day and may in part explain the concurrent rise in the popularity of offshore recreational fishing in the Gulf and elsewhere around the nation's Exclusive Economic Zone (Cooke et al. 2021).

Greater Amberjack Recreational Landings

Based on analysis of time-series data regarding the distribution of recreational greater amberjack landings in the Gulf region (GMFMC 2017b), the vast majority of such landings occur along the West Florida coastline.

For-Hire Permits

For-hire captains pursuing greater amberjack must possess a Gulf RCG permit. A total of 1,289 such permits were issued during 2020, the vast majority to residents or persons with mailing addresses in Alabama, Mississippi, Louisiana, Texas, and especially Florida (Table 3.5.2.1). A single Gulf RCG permit was issued during 2020 to persons with mailing addresses in New Hampshire, New York, Ohio, Pennsylvania, Delaware, and Virginia. A total of 804 or 62.4% of all Gulf RCG permits were issued to Florida vessels during 2020 (NMFS SERO SF Access permits database).

The number of for-hire reef fish permits held for use by vessel owners and captains operating from Orange Beach, Alabama and from Destin, Florida have, since at least 2008, far exceeded those held for use from other communities along the Gulf coastline. This merits summary description of place.

Situated in Baldwin County, Alabama, Orange Beach was home to 8,095 persons in 2020, having grown from 5,441 residents during the 2010 census count—a local population increase of 48.7% (U.S. Census Bureau 2020a). The community is situated on a barrier island along the easternmost inhabited portion of the state's coastline, affording locally moored vessels rapid access to the Gulf via Perdido Pass.

Destin, in Okaloosa County, Florida, was home to 13,931 persons in 2020, an increase of 1,626 persons above the 2010 census count (U.S. Census Bureau 2020b). Located on a peninsula between Choctawhatchee Bay and the Gulf in northwest Florida, Destin fleets are also directly adjacent to Gulf waters, in this case via East Pass. Both communities are popular Gulf tourist destinations.

Table 3.5.2.1. Distribution of Gulf of Mexico for-hire/headboat reef fish permits among the top permit-holding communities in the region during 2020.

State	Leading Communities	Number of Permits in 2020
Alabama	Orange Beach	102
Florida	Destin	101
Florida	Panama City	53
Louisiana	Venice	49
Texas	Galveston	48
Florida	Key West	47
Florida	Naples	45
Texas	Freeport	36
Florida	Panama City Beach	43
Texas	Port Aransas	30
Florida	Pensacola	26
Florida	Clearwater	26
Florida	St. Petersburg	25
Florida	Sarasota	21
Alabama	Dauphin Island	19
Florida	Crystal River	18
Mississippi	Biloxi	17
Florida	Madeira Beach	16
Florida	Marco Island	16
Florida	Tarpon Springs	15
Florida	Fort Myers	15
Louisiana	Grand Isle	15
Florida	Fort Myers Beach	14
Texas	Matagorda	13
Louisiana	Chauvin	12
Florida	Venice	12
Florida	Apalachicola	12
Florida	Bradenton	12

Source: NMFS SERO SF Access permits database.

Community Engagement & Reliance: Gulf Recreational Greater Amberjack Fishery

The full range of data indicative of social involvement in the Gulf greater amberjack recreational fishery sector is not readily available at the level of the community. As such, it is not possible with available information to identify communities that are specifically engaged in and/or reliant on recreational fishing for this species in particular.

Given that information regarding community-specific interaction with any given species is limited for the recreational sector, NOAA Fisheries social scientists have developed indices of utility for identifying communities where recreational fishing is an important component of the local economy in general (Jacob et al. 2013, Jepson and Colburn 2013, Hospital and Leong 2021). Based on these indices, and by selecting for presentation those communities with the

greatest number of Gulf RCG permits, Figure 3.5.2.1 below depicts measures of engagement and reliance among Gulf communities most likely involved in the greater amberjack recreational fishing sector. The measure of engagement depicted in the figure derives from the number of all for-hire permits and vessels actively used by residents in a given community. The measure of reliance derives from the same variables divided by the total local population figure.

While numerous communities depicted here demonstrate extensive engagement in recreational fisheries, only the communities of Venice in Louisiana and Dauphin Island in Alabama meet the one standard deviation threshold for *reliance* on the recreational sector. The measures of engagement and reliance provided here are useful means for indicating where any prospective effects of greater amberjack management actions are likely to be experienced.

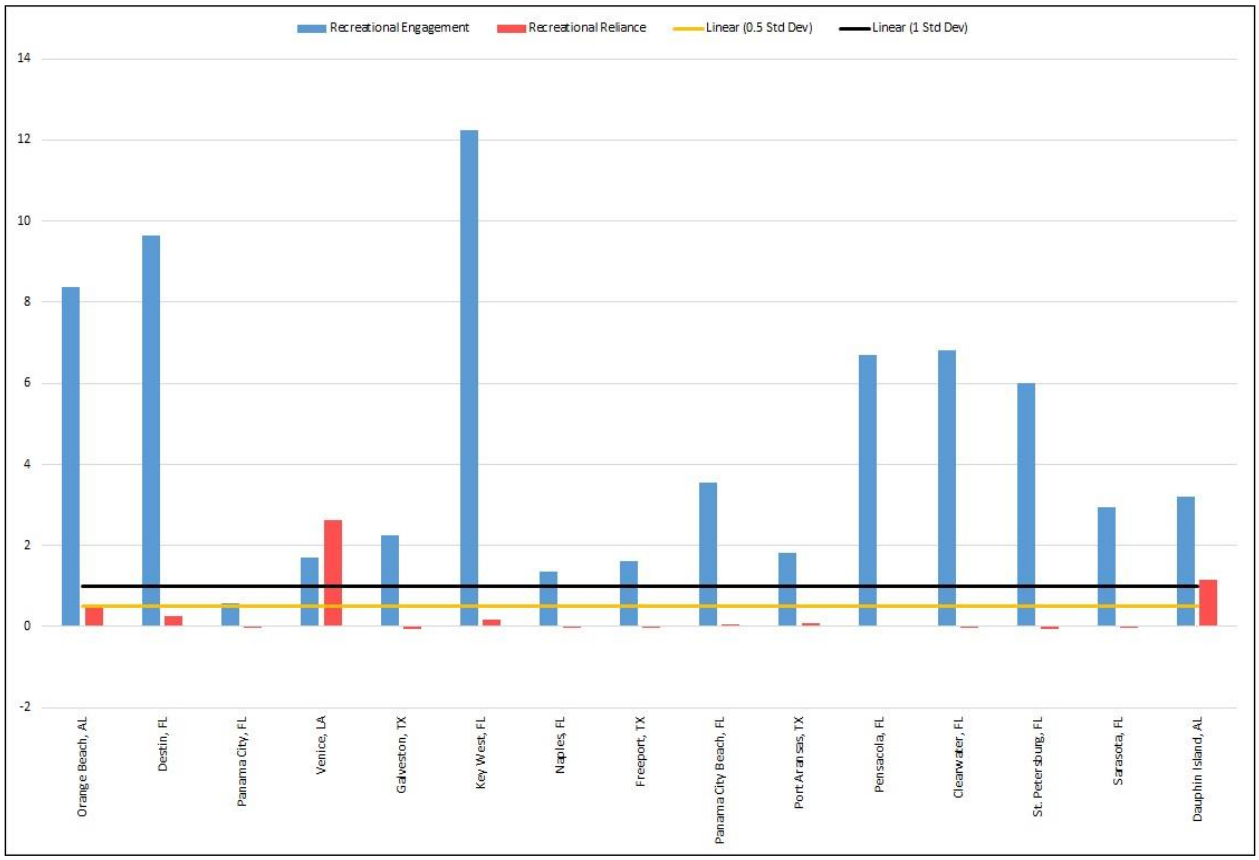

Figure 3.5.2.1. Measures of community involvement in the Gulf of Mexico recreational fishing industry during 2020.
Source: SERO, Community Social Vulnerability Indicators (CSVI) Database.

3.5.3 Environmental Justice

Established in 1994, Executive Order (E.O.) 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) requires federal agencies to examine the human health and socioeconomic implications of federal actions among low-income and minority groups and populations around the nation. E.O. 12898 requires that such agencies conduct programs, policies, and activities in a manner that ensures no individuals or populations

are excluded, denied the benefits of, or subjected to discrimination due to race, color, or nation of origin. Of particular relevance in the context of marine fisheries, federal agencies are further required to collect, maintain, and analyze data regarding patterns of consumption of fish and wildlife among persons who rely on such foods for purposes of subsistence. In sum, the principal intent of E.O. 12898 is to require assessment and due consideration of any "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."

Various forms of data are available to indicate environmental justice issues among minority and low-income populations and/or indigenous communities potentially affected by federal regulatory and other actions. With the intent of enhancing capacity to determine whether environmental justice issues may be affecting communities around the U.S. where fishing-related industry is an important aspect of the local economy, NMFS social scientists undertook an extensive series of deliberations and review of pertinent data and literature. The scientists ultimately selected key social, economic, and demographic variables that could function to identify social vulnerabilities at the community level of analysis (Jacob et al. 2013, Jepson and Colburn 2013). Census data such as community-specific rates of poverty, number of households maintained by single females, number of households with children under the age of five, rates of crime, and rates of unemployment exemplify the types of information chosen to aid in community analysis. Pertinent variables were subsequently used to develop composite indices that could be applied to assess vulnerability to environmental, regulatory, and other sources of change among the nation's fishing- and/or seafood-oriented communities.

As depicted in the following figures, three composite indices—termed here as poverty, population composition, and personal disruption—are applied to indicate relative degrees of vulnerability among communities most thoroughly engaged in the Gulf of Mexico greater amberjack fishery sectors of interest. Mean standardized scores for each community are provided along the y-axis, with means for the vulnerability measures and threshold standard deviations depicted along the x-axis. Scores exceeding the .5 standard deviation level indicate local social vulnerability to regulatory and other sources of change.

As can be discerned from Figure 3.5.5 below, of the top commercial greater amberjack landings communities—Bayou LaBatre in Alabama, and Golden Meadow and Houma in Louisiana—notably exceed the designated one standard deviation vulnerability threshold for one or more indices. Finally, Figure 3.5.6 below depicts social vulnerability measures for Gulf communities most extensively involved in the recreational fishing industry. The data presented here indicate social vulnerabilities in multiple communities, and especially in the communities of Venice, Louisiana, and Freeport, Texas. Both figures derive from data available in the SERO Community Social Vulnerability Indicators (CSVI) Database. Persons in the communities depicted in the graphics may be affected by fishing regulations in terms of participation and employment. Although the depicted communities bear the potential for environmental justice concerns in this context, the full range of pertinent data is not available to assess the issue in full. As such, although no specific environmental justice problems are identified here in relation to the greater amberjack fishery sectors, the absence of such issues cannot be assumed.

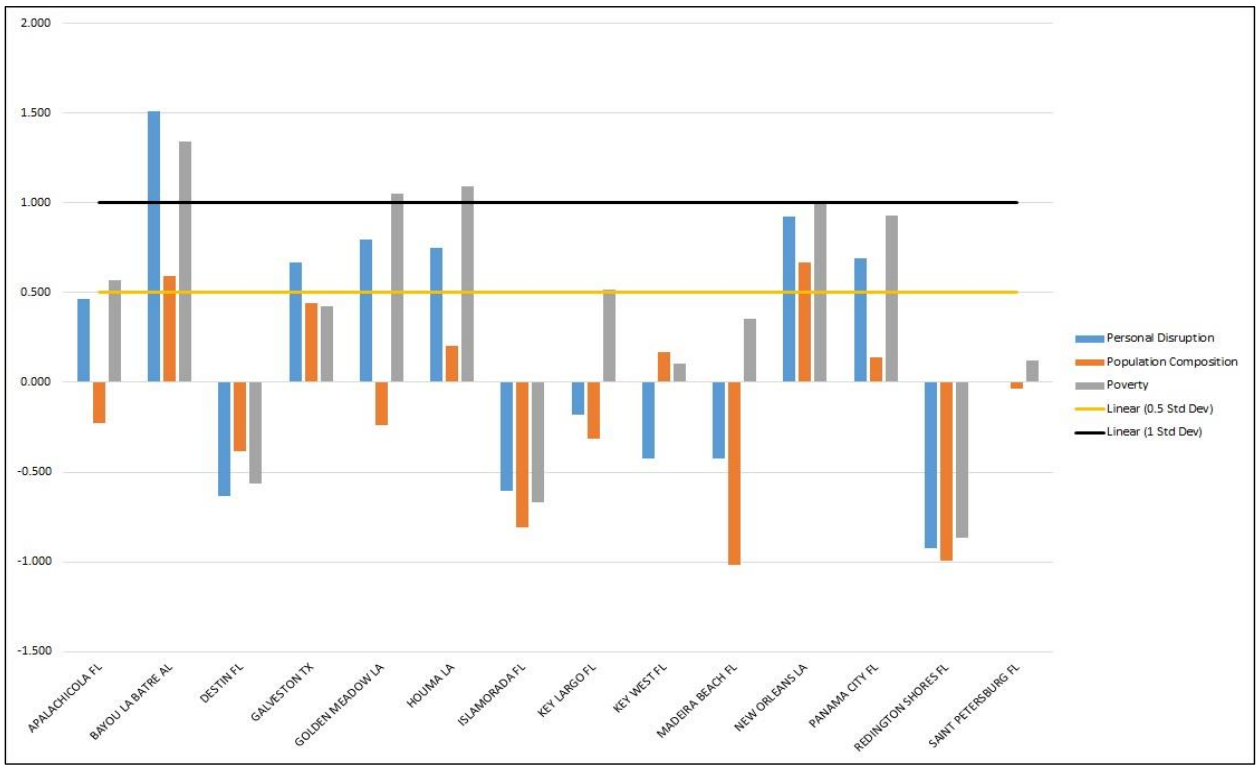

Figure 3.5.5 Social vulnerability measures for Gulf of Mexico communities with the greatest volume of commercial greater amberjack landings.
Source: SERO, CSVI Database.

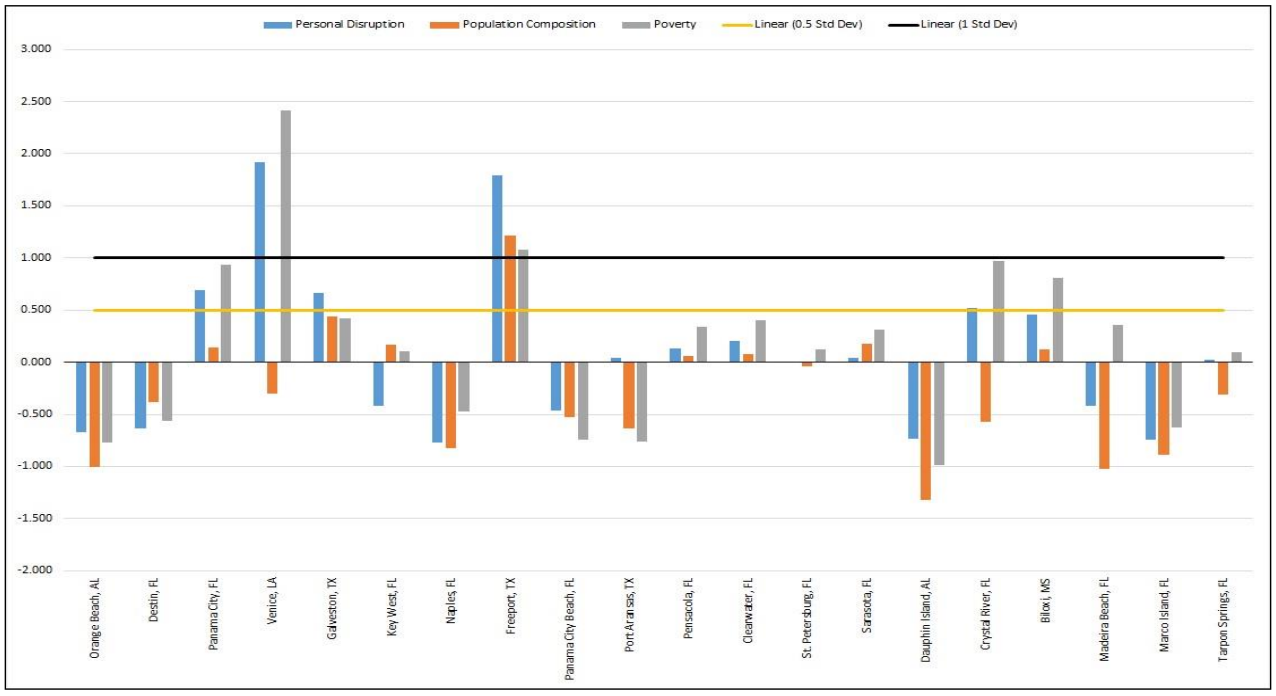

Figure 3.5.6 Social vulnerability measures for Gulf of Mexico communities with the greatest number of locally held for-hire reef fish permits.
Source: SERO CSVI Database.

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 Gulf Council is responsible for fishery resources in federal waters of the Gulf. These waters 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 Gulf 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.

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

Table 3.6.2.1. State marine resource agencies and web pages.

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

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action 1 – Modify the Gulf of Mexico Greater Amberjack Sector Allocations, Overfishing Limit (OFL), Acceptable Biological Catch (ABC), and Annual Catch Limits (ACL)

4.1.1 Direct and Indirect Effects on the Physical Environment

Greater amberjack are usually caught recreationally near the ocean surface with commercial catch being deeper. However, neither hook-and-line nor spear typically come in contact with bottom habitat. However, hook-and-line has the potential to snag and entangle bottom structures and cause tear-offs or abrasions (Barnette 2001). If gear is lost or improperly disposed of, it can entangle marine life. Entangled gear often becomes fouled with algal growth. If fouled gear becomes entangled on corals, the algae may eventually overgrow and kill the coral. Improper spear deployment near habitat can damage it if hit. Furthermore, physical impacts to the environment could occur when gear such as weights, hooks, and anchors hit and damage the substrate and surrounding habitat.

Modifications to the sector allocation, OFL, ABC, and ACL are not expected to result in significant effects on the physical environment as both sectors primarily use the same gear type (hook-and-line). Despite the sector allocation and catch limits proposed in **Alternatives 2-5** resulting in severely less fish to harvest and presumably less fishing days, fishing for greater amberjack is typically direct targeted by both sectors with fishing being able to occur for other reef fish species when greater amberjack is closed. However, in recent years, there has been a shift to greater amberjack being part of a multi-species fishing effort in both sectors. Thus, the effects on the physical environment of **Alternatives 2-5** are not expected to be measurably different from **Alternative 1**. Any impacts to the physical environment are expected to be minor because modifications to the sector allocation and catch limits will not change the fishing methods used or alter the execution of the reef fish fishery as a whole. It is assumed reef fish fishermen would continue to take trips, just fish for other species if greater amberjack harvest levels are reduced or the fishing season is closed. It would not change the fishing methods used or alter the execution of the multispecies reef fish fishery as a whole.

4.1.2 Direct and Indirect Effects on the Biological/Ecological Environment

Management actions that affect the biological environment mostly relate to the impacts of fishing on a species' population size, life history, and the role of the species within its habitat. Removal of fish from the population through fishing reduces the overall population size. Fishing gear types have different selectivity patterns, which refer to a fishing method's ability to target and capture organisms by size and species. This would include the size distribution of fish caught by the gear as well as the number of discards, mostly sublegal fish or fish caught during seasonal closures, and the mortality associated with releasing these fish. Indirect impacts of these alternatives on the biological environment would depend on the resulting reduction in the

level of fishing as a result of each alternative. Decreasing the catch limits reduces the amount of fish that can be harvested. A decrease in the amount of greater amberjack that can be harvested could cause an increase in greater amberjack discards if some are caught while targeting other reef fish species. As mentioned in Section 3.3, there is evidence that recreational fishers in the Gulf of Mexico (Gulf) are able to selectively target greater amberjack. SEDAR 70 (2020) stated that bycatch and discards of greater amberjack were low overall in the Gulf and the Data Workshop panel recommended a discard mortality rate for recreational greater amberjack of 10% and 20% for commercially harvested greater amberjack. The higher commercial percentage is due to catches being taken in deeper waters on average and possibility of being subject to greater barotrauma-related mortality. However, it is likely any increase in discards of greater amberjack associated with decreased catch limits would be minimal due to fisher's ability to target or avoid this species. Modification to the sector allocation is also not expected to affect the biological environment as both sectors primarily use the same gear types and both are constrained with in-season and post season accountability measures. While the recreational size limit and therefore size selectivity is smaller than for the commercial sector, it is still a size where at least 50% of adults are considered mature. Further, the reductions in the catch limits associated with **Alternatives 2-5** are projected to provide the greatest positive effect on the stock and allow rebuilding consistent with the current rebuilding timeline.

Under **Alternatives 2-5**, all the OFLs and ABCs are based on the results from Southeast Data Assessment and Review (SEDAR) 70 (2020) and the recommendations from the Gulf of Mexico Fishery Management Council's (Council) Scientific and Statistical Committee for a OFL with a maximum sustainable yield proxy (yield at $F_{30\%SPR}$) and ABC at the yield when fishing at $F_{Rebuild}$. Thus, each of these alternatives would result in a similar stock size at the end of the yield stream provided for 2027 ($SSB_{30\%SPR}$). The difference in the alternatives is when more fish are allocated to the recreational sector, total landings have to be constrained more to account for the greater dead discards from recreational greater amberjack fishing (e.g., **Alternative 2** compared to **Alternative 3**). While the overall discard percentage attributed to the recreational sector is lower than for the commercial sector, recreational fishermen outnumber commercial fishermen by magnitudes of millions. Further, alternatives that result in larger allocations to the recreational sector could increase the likelihood of overfishing due to the time lag in receiving recreational landings. However, the large buffer between the OFL and ABC helps reduce the potential impacts of this uncertainty. Similarly, the buffer between the ACL and ACT, and requiring a prohibition on the harvest of greater amberjack when the ACT is met or projected to be met, reduces the likelihood that the ACL will be exceeded. If the ACL is exceeded, the requirement to payback the overage mitigates the negative impacts on the stock. The catch limits under **Alternative 1** are based on Marine Recreational Information Program (MRIP) Coastal Household Telephone Survey (CHTS) and SEDAR 33 Update (2016). Both of which are not considered best available science, would allow for landings that are not consistent with the rebuilding plan, and would continue to allow overfishing, which is expected to result in negative effects to the biological environment. **Alternatives 2-5** are expected to have positive effects on the biological environment since they are expected to end overfishing and rebuild the stock. By reducing fishing mortality, the number of older, larger fish in the population are expected to increase and help the stock meet its rebuilding timeline.

With respect to discards, projected reductions in season length due to reduced catch limits could have negative effects to greater amberjack due to additional regulatory discards that could occur during the longer closed periods. Projections for **Alternative 1** are not included since the catch levels in this alternative are not based on the best scientific information available. The projected 2022/2023 recreational in-season closure date under the current annual catch target (ACT) buffer (17%) under **Alternative 2** is August 23. The latest projected recreational in-season closure date under the current ACT buffer is under **Alternative 3** (August 26), with **Alternatives 4** and **5** (August 24 and 25 respectively) falling in between **Alternatives 2** and **3** (Appendix F). **Alternatives 2-5** would all result in a reduction from the current (**Alternative 1**) days open for recreational greater amberjack harvest (123 days). However, **Alternative 1** would be expected to result in adverse biological effects to the greater amberjack stock as it would not reduce the rate of overfishing and present a serious conservation issue to the stock if harvest continues at the rate seen in previous years. With only a few days separating the projected recreational closures under all of the alternatives, the number of recreational discards is expected to be similar. However, reduced catch limits and the subsequent reduced season length could create a derby fishing situation. If anglers only have a month to harvest greater amberjack, for-hire operations may run multiple trips in a day. This increase in fishing effort may not be reflected in the estimates of season length that were projected. In addition, the occurrence of high-grading may increase. High-grading is throwing back a previously caught fish and keeping a larger fish in its place. This could negatively affect the greater amberjack stock by increasing discard mortality, although as noted above, the discard mortality rate is relatively low.

The projected 2023 commercial in-season closure date under the current ACT buffer (13%) under **Alternatives 2** is October 24. This is the latest projected commercial in-season closure date. In-season closure dates become earlier as less allocation is given to this sector: **Alternative 4** – August 16, **Alternative 5-** July 27, and **Alternative 3-** June 24 (Appendix G). **Alternatives 2-5** would all result in a reduction from the current (**Alternative 1**) days open for commercial greater amberjack harvest as no commercial closures have occurred since 2019. Additionally, commercial trips are expected to be subject to the reduced trip limit of 250 lbs by June 19 under **Alternative 2**, February 13 under **Alternative 3**, February 27 under **Alternative 4**, and February 22 under **Alternative 5** (Appendix G). While this may make trips uneconomical, if targeted trips no longer occur, less greater amberjack may be harvested, which would be beneficial to the stock. Modification of sector allocation with more going to the recreational sector all have implications on the amount of commercial discards that could occur. However, as mentioned in Ch. 3, fishermen can select to target greater amberjack. Further, discard mortality for greater amberjack is expected to be low suggesting that the stock could handle additional regulatory discards.

The relationships among species in marine ecosystems are complex and poorly understood, making the nature and magnitude of ecological effects difficult to predict with any accuracy. It is possible that forage species and competitor species could increase or decrease in abundance in response to a decrease or increase in greater amberjack abundance. However, the relationships between greater amberjack and non-target species caught on trips where greater amberjack are directly targeted are not fully understood. Overall, any effects of reducing greater amberjack catch limits are not expected to be significant because the overall prosecution of the Reef Fish fishery is not expected to change. For this same reason, no additional impacts to Endangered

Species Act (ESA)-listed species or introduction of invasive species are anticipated as a result of this action.

Alternatives 2-5 are all expected to result in positive benefits to the resource by reducing the rate of harvest enough to protect the greater amberjack stock, but none of those effects are expected to be significant.

4.1.3 Direct and Indirect Effects on the Economic Environment

Alternative 1 (No Action) would maintain the current reference points (OFL and ABC) and the total and sector ACLs for greater amberjack. Therefore, **Alternative 1** would not be expected to change fishing practices or recreational and commercial harvests of greater amberjack and would not be expected to result in economic effects. However, **Alternative 1** would not be consistent with the Scientific and Statistical Committee's (SSC) latest recommendations and would not constitute a viable alternative because the reference points and ACLs are based on MRIP-Coastal Household Telephone Survey (CHTS) units. Furthermore, **Alternative 1** would not be viable because it would not implement reductions in catch levels necessary to end overfishing.

Alternatives 2-5 consider modifications to the allocation of greater amberjack resources between the recreational and commercial sectors, adjustments to the OFL, ABC and total and sector-specific ACLs. To end overfishing, **Alternatives 2-5** would all implement sizeable reductions in catch levels between 2022 and 2027. Therefore, economic losses to the commercial and recreational sectors would be expected to result from these alternatives.

For the commercial sector, economic effects that would be expected to result from the alternatives were measured by estimating changes in ex-vessel value and in producer surplus, i.e., economic value. Changes in ex-vessel values are estimated by multiplying expected decreases in commercial landings by an average ex-vessel price for greater amberjack. For each alternative, and for each year between 2022 and 2027, expected decreases in commercial harvests were obtained by subtracting the proposed commercial ACLs from status quo commercial landings as measured by average commercial greater amberjack landings between 2015 and 2019. Commercial landings used to compute the 2015-19 average are provided in Table 1.1.3. Initially expressed in pounds of whole weight, expected decreases in landings were converted into lbs gutted weight using a conversion factor of 1.04 (M. Larkin, pers. comm. 2022). An average ex-vessel price of $1.92/lb gw in $2020 (derived from 2016-2020 average greater amberjack landings and revenues) was used to compute the changes in ex-vessel values. For **Alternatives 2-5**, expected changes in commercial greater amberjack commercial landings expressed in lbs ww and lbs gutted weight and associated estimated changes in nominal ex-vessel values are provided in Table 4.1.3.1. Discount rates of three (3) and seven (7) percent per annum were used to compute net present values. Net present values of estimated changes in ex-vessel values are provided in Table 4.1.3.2.

Between 2022 and 2027, decreases in commercial landings expected to result from **Alternatives 2-5** range from 1.27 mp ww (**Alternative 2**) to 1.83 mp ww (**Alternative 3**). For the same time interval, resulting losses in ex-vessel values were estimated at $2.35 million (**Alternative 2**) and

$3.39 million (**Alternative 3**). Using a 7% discount rate, the corresponding net present values are estimated at $2.05 million and $2.91 million, respectively.

Table 4.1.3.1. Commercial greater amberjack ACLs, expected decreases in landings and ex-vessel values (2022-2027).

Alternatives	Year	Commercial ACL (ww)	Expected decreases in landings: Average commercial landings (2015-19) minus commercial		
			Pounds (ww)	Pounds (gw)	Ex vessel value
Alternative 2	2022	140,670	288,443	277,349	$532,511
	2023	175,230	253,883	244,119	$468,708
	2024	207,900	221,213	212,705	$408,394
	2025	236,250	192,863	185,446	$356,056
	2026	260,280	168,833	162,340	$311,692
	2027	279,450	149,663	143,907	$276,302
	Total	**1,299,780**	**1,274,900**	**1,225,866**	**$2,353,662**
Alternative 3	2022	79,520	349,593	336,148	$645,403
	2023	99,360	329,753	317,071	$608,776
	2024	118,240	310,873	298,917	$573,920
	2025	134,720	294,393	283,071	$543,496
	2026	148,640	280,473	269,686	$517,797
	2027	159,840	269,273	258,917	$497,120
	Total	**740,320**	**1,834,360**	**1,763,808**	**$3,386,512**
Alternative 4	2022	111,980	317,133	304,936	$585,477
	2023	139,920	289,193	278,071	$533,896
	2024	166,320	262,793	252,686	$485,157
	2025	189,200	239,913	230,686	$442,917
	2026	208,340	220,773	212,282	$407,582
	2027	223,960	205,153	197,263	$378,745
	Total	**1,039,720**	**1,534,960**	**1,475,923**	**$2,833,773**
Alternative 5	2022	101,000	328,113	315,494	$605,748
	2023	126,200	302,913	291,263	$559,225
	2024	150,000	279,113	268,378	$515,286
	2025	170,800	258,313	248,378	$476,886
	2026	188,200	240,913	231,648	$444,763
	2027	202,400	226,713	217,994	$418,548
	Total	**938,600**	**1,636,080**	**1,573,154**	**$3,020,456**

Note: All monetary values are in $2020

Table 4.1.3.2. Decreases in ex-vessel values and in economic values (nominal values and net present values based on 3% and 7% per year discount rates).

	Year	Decreases in Ex vessel value		
		Nominal Value	Net Present Value (3%)	Net Present Value (7%)
Alternative 2	2022	$532,511	$532,511	$532,511
	2023	$468,708	$455,056	$438,045
	2024	$408,394	$384,950	$356,707
	2025	$356,056	$325,841	$290,647
	2026	$311,692	$276,935	$237,789
	2027	$276,302	$238,340	$196,999
	Total	**$2,353,662**	**$2,213,634**	**$2,052,698**
Alternative 3	2022	$645,403	$645,403	$645,403
	2023	$608,776	$591,044	$568,949
	2024	$573,920	$540,975	$501,284
	2025	$543,496	$497,375	$443,654
	2026	$517,797	$460,056	$395,025
	2027	$497,120	$428,820	$354,440
	Total	**$3,386,512**	**$3,163,674**	**$2,908,755**
Alternative 4	2022	$585,477	$585,477	$585,477
	2023	$533,896	$518,345	$498,968
	2024	$485,157	$457,307	$423,755
	2025	$442,917	$405,332	$361,552
	2026	$407,582	$362,131	$310,942
	2027	$378,745	$326,709	$270,040
	Total	**$2,833,773**	**$2,655,301**	**$2,450,734**
Alternative 5	2022	$605,748	$605,748	$605,748
	2023	$559,225	$542,937	$522,640
	2024	$515,286	$485,707	$450,071
	2025	$476,886	$436,418	$389,281
	2026	$444,763	$395,166	$339,308
	2027	$418,548	$361,043	$298,419
	Total	**$3,020,456**	**$2,827,019**	**$2,605,467**

Note: All monetary values are in $2020

For the recreational sector, the expected economic effects of **Alternatives 2-5** were measured in changes in economic value, i.e., changes in consumer surplus (CS) for anglers. CS per additional fish kept during a trip is defined as the amount of money an angler would be willing to pay for a fish in excess of the cost to harvest the fish. The expected changes in CS were based on the estimated CS per greater amberjack and on the difference in landings relative to the status quo. Consistent with the CS provided in Section 3.3, an average CS of $33 ($2020) per greater

amberjack is used in this analysis. Decreases in economic value to the for-hire sector, which would be measured by decreases in producer surplus associated with lost target trips are not included in this analysis due to lack of information relative to the responsiveness of target trips to changes in recreational greater amberjack ACL. Therefore, estimated losses in recreational economic value provided in this section are lower bound estimates. As previously indicated, **Alternatives 2-5** would significantly decrease the recreational ACL and therefore, **Alternatives 2-5** would all be expected to result in lower recreational greater amberjack harvests and associated losses in economic value to the recreational sector. For each alternative, expected decreases in recreational harvests are computed by subtracting the proposed recreational ACL from average greater amberjack recreational landings between 2015 and 2019 based on data provided in Table 1.1.3. Decreases in recreational harvests were converted into number of fish using an average of 25.96 lbs per greater amberjack (M. Larkin, pers. Comm., 2022). Estimated decreases in recreational greater amberjack landings in pounds and in number of fish, expected nominal losses in economic value, and net present value of losses are provided in Table 4.1.3.3.

Table 4.1.3.3. Recreational greater amberjack ACLs, expected decreases in landings, decreases in economic value (2022-2027).

Alternatives	Year	Recreational ACL (ww)	Decreases in landings: Average Recreational Landings (2015-19) minus Recreational ACL				
			Pounds (ww)	Number of fish	Nominal Economic value	Net Present Value (3%)	Net Present Value (7%)
Alternative 2	2022	380,330	1,455,779	56,078	$1,850,567	$1,850,567	$1,850,567
	2023	473,770	1,362,339	52,478	$1,731,787	$1,681,347	$1,618,493
	2024	562,100	1,274,009	49,076	$1,619,503	$1,526,537	$1,414,537
	2025	638,750	1,197,359	46,123	$1,522,067	$1,392,907	$1,242,460
	2026	703,720	1,132,389	43,621	$1,439,478	$1,278,958	$1,098,171
	2027	755,550	1,080,559	41,624	$1,373,592	$1,184,873	$979,352
	Total	**3,514,220**	**7,502,436**	**289,000**	**$9,536,995**	**$8,915,189**	**$8,203,580**
Alternative 3	2022	417,480	1,418,629	54,647	$1,803,342	$1,803,342	$1,803,342
	2023	521,640	1,314,469	50,634	$1,670,936	$1,622,268	$1,561,622
	2024	620,600	1,215,509	46,822	$1,545,139	$1,456,442	$1,349,584
	2025	707,280	1,128,829	43,483	$1,434,953	$1,313,185	$1,171,349
	2026	780,360	1,055,749	40,668	$1,342,054	$1,192,398	$1,023,847
	2027	839,160	996,949	38,403	$1,267,309	$1,093,191	$903,573
	Total	**3,886,520**	**7,130,136**	**274,659**	**$9,063,733**	**$8,480,826**	**$7,813,318**
Alternative 4	2022	397,020	1,439,089	55,435	$1,829,351	$1,829,351	$1,829,351
	2023	496,080	1,340,029	51,619	$1,703,427	$1,653,813	$1,591,988
	2024	589,680	1,246,429	48,013	$1,584,444	$1,493,491	$1,383,915
	2025	670,800	1,165,309	44,889	$1,481,326	$1,355,623	$1,209,203
	2026	738,660	1,097,449	42,275	$1,395,063	$1,239,495	$1,064,287
	2027	794,040	1,042,069	40,141	$1,324,664	$1,142,667	$944,467
	Total	**3,686,280**	**7,330,376**	**282,372**	**$9,318,275**	**$8,714,439**	**$8,023,211**
Alternative 5	2022	404,000	1,432,109	55,166	$1,820,478	$1,820,478	$1,820,478
	2023	504,800	1,331,309	51,283	$1,692,342	$1,643,051	$1,581,628
	2024	600,000	1,236,109	47,616	$1,571,326	$1,481,125	$1,372,457
	2025	683,200	1,152,909	44,411	$1,465,563	$1,341,198	$1,196,336
	2026	752,800	1,083,309	41,730	$1,377,088	$1,223,525	$1,050,574
	2027	809,600	1,026,509	39,542	$1,304,885	$1,125,605	$930,365
	Total	**3,754,400**	**7,262,256**	**279,748**	**$9,231,682**	**$8,634,982**	**$7,951,838**

Note: All monetary values are in $2020

Between 2022 and 2027, decreases in recreational greater amberjack landings expected to result from **Alternatives 2-5** range from 7.13 mp ww or 274,659 fish (**Alternative 3**) to 7.50 mp ww or 289,000 fish (**Alternative 2**). For the same time interval, resulting losses in economic value were estimated at $8.48 million (**Alternative 3**) and $8.92 million (**Alternative 2**). Using a 7% discount rate, the corresponding net present values are estimated at $7.81 million and $8.20 million, respectively.

Combined losses in recreational economic values and in commercial ex-vessel values are provided in Table 4.1.3.4. In nominal terms, combined losses during the 2022 to 2027 interval approximately range from $11.89 million under **Alternative 2** to $12.45 million under **Alternative 3**. Using a 7% annual discount, corresponding net present values of combined losses are estimated at $10.26 million and $10.72 million, respectively.

Table 4.1.3.4. Combined decreases in commercial ex-vessel and in recreational economic values.

	Year	Decreases in commercial ex-vessel values and in recreational economic values		
		Nominal Value	Net Present Value (3%)	Net Present Value (7%)
Alternative 2	2022	$2,383,078	$2,383,078	$2,383,078
	2023	$2,200,495	$2,136,403	$2,056,538
	2024	$2,027,897	$1,911,488	$1,771,244
	2025	$1,878,123	$1,718,748	$1,533,107
	2026	$1,751,170	$1,555,892	$1,335,960
	2027	$1,649,894	$1,423,213	$1,176,352
	Total	**$11,890,658**	**$11,128,822**	**$10,256,278**
Alternative 3	2022	$2,448,746	$2,448,746	$2,448,746
	2023	$2,279,711	$2,213,312	$2,130,571
	2024	$2,119,059	$1,997,417	$1,850,868
	2025	$1,978,448	$1,810,560	$1,615,003
	2026	$1,859,851	$1,652,454	$1,418,872
	2027	$1,764,429	$1,522,012	$1,258,013
	Total	**$12,450,244**	**$11,644,500**	**$10,722,073**
Alternative 4	2022	$2,414,828	$2,414,828	$2,414,828
	2023	$2,237,323	$2,172,158	$2,090,956
	2024	$2,069,601	$1,950,798	$1,807,670
	2025	$1,924,243	$1,760,955	$1,570,755
	2026	$1,802,644	$1,601,626	$1,375,229
	2027	$1,703,409	$1,469,376	$1,214,507
	Total	**$12,152,048**	**$11,369,740**	**$10,473,945**
Alternative 5	2022	$2,426,226	$2,426,226	$2,426,226
	2023	$2,251,567	$2,185,988	$2,104,268
	2024	$2,086,612	$1,966,832	$1,822,528
	2025	$1,942,449	$1,777,616	$1,585,617
	2026	$1,821,851	$1,618,691	$1,389,882
	2027	$1,723,433	$1,486,648	$1,228,784
	Total	**$12,252,138**	**$11,462,001**	**$10,557,304**

Note: All monetary values are in $2020

4.1.4 Direct and Indirect Effects on the Social Environment

This action would reduce the greater amberjack catch limits based on the results of the recent stock assessment and subsequent recommendations by the SSC; the stock continues to be overfished and undergoing overfishing. In general, lower catch limits would be associated with negative effects in the short term as they allow for less fish to be landed. These negative effects would be expected to be mitigated over the long term as reduced harvest levels allow the stock to rebuild, leading to higher catch limits in the future. Related to the catch limit reduction, the most recent stock assessment uses the Fishing Effort Survey (FES) adjusted Marine Recreational Information Program (MRIP) data. Updating the units for monitoring recreational landings and calibrating historical landings affects the allocation between the sectors when MRIP-FES data are applied to the same time series used for the current allocation (**Alternative 3**). Thus, this action updates the MRIP-CHTS data with MRIP-FES data, which impacts the sector allocations, either directly, if an alternative that revises the allocation percentages (**Alternatives 3-5**) is selected as preferred, or indirectly, if the alternative that retains the allocation percentages (**Alternative 2**) is selected as preferred, because MRIP-FES estimates greater recreational landings than MRIP-CHTS.

Additional effects would not be expected under **Alternative 1**, as the catch limits for both sectors would remain at current levels, including the recreational portion of the catch levels set in MRIP-CHTS, and fishing practices would not be affected. However, this alternative is not based on the best scientific information available and would not allow the stock to rebuild consistent with the current rebuilding time frame. **Alternatives 2-5** would reduce the catch levels substantially compared to **Alternative 1**, resulting in negative effects for both the recreational and commercial sectors, as less fish is available to be landed. The magnitude of these effects would be relative to the size of each sector's reduction from **Alternative 1**.

At the same time the catch levels are reduced, **Alternatives 2-5** would adopt MRIP-FES units for the recreational sector's portion of the ACL, indirectly affecting the allocation between the recreational and commercial sectors. In theory, there should be no effects under **Alternatives 2-5** from converting the recreational sector's ACL from MRIP-CHTS units to MRIP-FES units, as the change from MRIP-CHTS units to MRIP-FES units is intended to be a conversion. However, adopting MRIP-FES units for the recreational sector and holding the commercial ACL at its current level under **Alternative 1** would result in a recreational sector ACL that is not an equivalent conversion from MRIP-CHTS to MRIP-FES (i.e., proposed recreational ACL of 380,330 lbs ww in 2022 under **Alternative 2** is not equivalent to the recreational sector ACL of 1,309,620 lbs ww in MRIP-CHTS under **Alternative 1**).

To compare **Alternatives 2-5**, which propose total ACLs that use MRIP-FES units for the recreational component of the total ACL, the 5-year average landings for 2015-2019 were calculated from Table 1.1.3 for the recreational (1,836,109 lbs ww) and commercial (429,113 lbs ww) sectors. Table 4.1.4.1 (recreational sector) and Table 4.1.4.2 (commercial sector) compare the differences between the 5-year average landings for each sector with the proposed sector ACLs, and provide the percent decrease represented by each proposed ACL compared to that sector's 5-year average landings. (During some of these years, one or both sector ACLs were exceeded.)

Table 4.1.4.1. Comparison of the recreational ACLs under **Alternatives 2-5**, the difference from each proposed ACL and the average recreational landings (2015-2019), the percent change to the recreational ACL from the average recreational landings, and the resulting recreational sector allocation.

Alternative	Year	Recreational ACL (lbs ww)	Difference from Avg Landings (lbs ww)	Change (%) from 5-yr Avg Landings	Rec Allocation (%)
2	2022	380,330	-1,455,779	-79%	73%
	2023	473,770	-1,362,339	-74%	73%
	2024	562,100	-1,274,009	-69%	73%
	2025	638,750	-1,197,359	-65%	73%
	2026	703,720	-1,132,389	-62%	73%
	2027	755,550	-1,080,559	-59%	73%
3	2022	417,480	-1,418,629	-77%	84%
	2023	521,640	-1,314,469	-72%	84%
	2024	620,600	-1,215,509	-66%	84%
	2025	707,280	-1,128,829	-61%	84%
	2026	780,360	-1,055,749	-57%	84%
	2027	839,160	-996,949	-54%	84%
4	2022	397,020	-1,439,089	-78%	78%
	2023	496,080	-1,340,029	-73%	78%
	2024	589,680	-1,246,429	-68%	78%
	2025	670,800	-1,165,309	-63%	78%
	2026	738,660	-1,097,449	-60%	78%
	2027	794,040	-1,042,069	-57%	78%
5	2022	404,000	-1,432,109	-78%	80%
	2023	504,800	-1,331,309	-73%	80%
	2024	600,000	-1,236,109	-67%	80%
	2025	683,200	-1,152,909	-63%	80%
	2026	752,800	-1,083,309	-59%	80%
	2027	809,600	-1,026,509	-56%	80%

Note: The 5-year average landings were calculated for 2105-2019, based on the MRIP-FES values in Table 1.1.3.

Table 4.1.4.2. Comparison of the commercial ACLs under Alternatives 2-5, the difference from each proposed ACL and the average commercial landings (2015-2019), the percent change to the commercial ACL from the average commercial landings, and the resulting commercial sector allocation.

Alternative	Year	Commercial ACL (lbs ww)	Difference from Avg Landings (lbs ww)	Change (%) from 5-yr Avg Landings	Comm Allocation (%)
2	2022	140,670	-288,443	-67%	27%
	2023	175,230	119,963	-59%	27%
	2024	207,900	496,343	-52%	27%
	2025	236,250	116,287	-45%	27%
	2026	260,280	-236,063	-39%	27%
	2027	279,450	163,163	-35%	27%
3	2022	79,520	315,583	-81%	16%
	2023	99,360	-63,803	-77%	16%
	2024	118,240	-197,343	-72%	16%
	2025	134,720	198,523	-69%	16%
	2026	148,640	345,983	-65%	16%
	2027	159,840	-38,683	-63%	16%
4	2022	111,980	-234,003	-74%	22%
	2023	139,920	178,603	-67%	22%
	2024	166,320	400,323	-61%	22%
	2025	189,200	10,597	-56%	22%
	2026	208,340	-191,983	-51%	22%
	2027	223,960	213,363	-48%	22%
5	2022	101,000	292,983	-76%	20%
	2023	126,200	-87,163	-71%	20%
	2024	150,000	-142,983	-65%	20%
	2025	170,800	257,963	-60%	20%
	2026	188,200	331,183	-56%	20%
	2027	202,400	-55,563	-53%	20%

Note: The 5-year average landings were calculated for 2105-2019 from Table 1.1.3.

The effects on each sector and under each alternative differ for the ACL reduction and the effect on the sector allocation from the MRIP-FES conversion. With the increasing yield stream recommended by the SSC, the ACLs for each sector represent the greatest reduction from **Alternative 1** in 2022, then increase each year thereafter through 2027 allowing more fish to be caught. This should reduce the negative effects from lost harvest opportunities compared with the previous year of the yield stream. For the recreational sector, the greatest negative effects would be expected under **Alternative 2**, followed by **Alternative 4**, **Alternative 5**, and the least negative effects would be expected under **Alternative 3**. For the commercial sector, the effects are inversed, such that the greatest negative effects would be expected under **Alternative 3**,

followed by **Alternative 5**, **Alternative 4**, and the least negative effects would be expected under **Alternative 2**.

A sector allocation is a policy designation of the rights to access that also carries socio-cultural significance. The current 73% recreational to 27% commercial sector allocation reflects the greater historical engagement with the greater amberjack stock by the recreational sector compared to the commercial sector. Tables 4.1.4.1 and Table 4.1.4.2 provide each sector's respective allocation under **Alternatives 2-5**. **Alternative 2** would retain the existing sector allocation (73% recreational; 27% commercial) while adopting MRIP-FES units for the recreational sector and keeping the same commercial ACL as under **Alternative 1**. By retaining the same allocation, additional effects would not be expected from **Alternative 2** in terms of a change to the sector allocation. However, as discussed in the section above on revising the catch limits, the sector ACLs underlying the allocation for **Alternative 2** reflect a change in the amount of fish that would go to each sector compared to **Alternative 1**, with more fish going to the commercial sector and less fish going to the recreational sector. Compared to **Alternatives 1** and **2**, **Alternatives 3-5** would reallocate 11%, 5%, or 7%, respectively, of the new total ACL from the commercial sector to the recreational sector, resulting in negative effects for the commercial sector and positive effects for the recreational sector. Because **Alternatives 3-5** each result in a shift in allocation from the commercial sector to the recreational sector, the types of effects on the social environment would be similar among the alternatives. The direct effects from **Alternatives 3-5** would vary in scope and strength relative to the amount of quota that is reallocated.

This analysis compares the effects of a reasonable range of alternatives to comply with the National Environmental Policy Act. As discussed above, the alternatives would be expected to affect the commercial and recreational fishing sectors in ways that can be compared. Fishing communities are identified in Chapter 3 to meet the requirements of National Standard 8 of the Magnuson-Stevens Fishery Management and Conservation Act, which calls for examination of linkages between fishery resources and human communities when regulatory changes are under consideration. There is no information available to suggest that the effects of this action would affect the place-based communities identified in Chapter 3 in different ways.

4.1.5 Direct and Indirect Effects on the Administrative Environment

Modifying sector allocation and ACL does not typically result in significant effects on the administrative environment. **Alternative 1** is not expected to affect the administrative environment by not changing the current sector allocation or ACL, however, overall it would continue more administrative burden due to the need to convert landings back to MRIP-CHTS for management. **Alternatives 2-5** would result in a short-term increased burden on the administrative environment due to the establishment of a new ACL. Changing the ACL from **Alternative 1** would increase the burden for NMFS, which would have to engage in rulemaking to implement this change in management, although this change is routine and considered minimal. However, **Alternatives 2-5** would no longer require NMFS to convert landings. All alternatives, except **Alternative 1**, would result in a decrease in the sector ACLs, which may increase the likelihood of needing to implement an in-season closure. However, in-season closures are routinely completed for reef fish species. Changing sector allocations are not

something that is codified, so modifying those under **Alternatives 3-5** would result in no effect. There is also no effect on the administrative burden for law enforcement as law enforcement officers do not monitor catch limits, but would only continue to monitor compliance with any established closed season. Some administrative burden is anticipated under **Alternatives 2-5** with respect to outreach as it relates to notifying stakeholders of the changes to the sector allocation and ACL. None of the expected effects are expected to be significant.

4.2 Action 2 – Modify the Gulf of Mexico Greater Amberjack Sector Annual Catch Targets (ACT) Based on the Catch Limits and Allocation Selected in Action 1

4.2.1 Direct and Indirect Effects on the Physical Environment

Modifications to the sector ACTs are not expected to result in significant effects on the physical environment as both sectors primarily use the same gear type and the ACT would only be used to project the time fishing for greater amberjack could possibly be closed. As mentioned in Section 4.1.1, fishing is able to occur for other reef fish species when greater amberjack is closed. Thus, the effects under **Alternatives 2** and **3** on the physical environment are not expected to be measurably different from **Alternative 1**. Any impacts to the physical environment are expected to be minor because modifications to the ACT will not change the fishing methods used or alter the execution of the reef fish fishery as a whole. It is assumed reef fish fishermen would continue to take trips, just fish for other species if greater amberjack is closed.

4.2.2 Direct and Indirect Effects on the Biological/Ecological Environment

General effects on the biological/ecological environment from fishing are described in Section 4.1.2.

Alternative 1 would maintain the buffers between the respective commercial and recreational ACLs and ACTs (17% for the recreational sector and 13% for the commercial sector). The buffer is used to constrain harvest and the likelihood of exceeding the applicable ACL. **Alternative 2** reduces the buffer for both sectors (13% for the recreational sector and 7% for the commercial sector), while **Alternative 3** reduces it only for the commercial sector (7%). A reduced buffer means less restriction on harvest and therefore more fish allowed to be caught before an in-season closure would be triggered. Recreational landings are generated based on estimates of catch and effort and have greater uncertainty associated with them than commercial landings. In addition, there is a lag in recreational landings because they are monitored in waves (2-month intervals) and require quality control checks. This often means landing estimates are not available until several months from when fishing takes place. Thus, implementing the lower ACT buffer in **Alternative 2** for the recreational sector would increase the likelihood of exceeding the recreational ACL when compared to **Alternatives 1** and **3**. Exceeding the ACL may result in negative effects on the stock if the overage is substantial. However, the reduction in ACT buffer under **Alternative 2** does little in extend the recreational fishing season (Table 4.2.2.1). Therefore, the effects under a reduced recreational buffer under **Alternative 2** is expected to be negligible compared to **Alternatives 1** and **3.** In the commercial sector, there is

less risk of exceeding the ACL because landings are more timely and no in-season closure is projected until mid-year (Table 4.2.2.2), even if the 13% buffer were retained. Further, the commercial sector is subject to a trip limit step down that would slow landings and help with accuracy of an in-season closure projection. Therefore, the effects of reducing the commercial buffer under **Alternatives 2** and **3** are expected to be negligible even though the reduced buffer extends the commercial season more so than what is seen in for the recreational sector (Table 4.2.2.2). As mentioned in Section 3.1.1 and 3.1.2, both sectors have not been subjected to an in-season closure since 2019.

Table 4.2.2.1. The projected dates the proposed 2023 ACT would be met for the Gulf greater amberjack recreational sector for a range of 2023 ACTs being considered in Reef Fish Amendment 54. The ACT met dates assume the recreational sector opens on August 1. The ACTs are in pounds whole weight.

	Action 2 ACT Buffer Alternatives		
Action 1 ACL	ACL Buffer	2023 ACT	ACT Met Date
Alt. 2	17%	393,229	23-Aug
Alt. 3	17%	432,961	26-Aug
Alt. 4	17%	411,746	24-Aug
Alt. 5	17%	418,984	25-Aug
Alt. 2	13%	412,180	25-Aug
Alt. 3	13%	453,827	27-Aug
Alt. 4	13%	431,590	26-Aug
Alt. 5	13%	439,176	26-Aug

Table 4.2.2.2. The projected dates at 75% of the ACT and when the total proposed 2023 ACTs would be met for the Gulf greater amberjack commercial sector for a range of 2023 ACTs being considered in Reef Fish Amendment 54. These projected dates assume the current fixed closed season of March 1 through May 1 was retained. The ACTs are in pounds whole weight.

	Action 2 ACT Buffer Alternatives				
Action 1 ACL	ACL Buffer	75% of 2023 ACT	75% of ACT Met Date	2023 ACT	100% of ACT Met
Alt. 2	13%	114,338	Jun-19	152,450	Oct-24
Alt. 3	13%	64,832	Feb-13	86,443	Jun-24
Alt. 4	13%	91,298	Feb-27	121,730	Aug-16
Alt. 5	13%	82,346	Feb-22	109,794	Jul-27
Alt. 2	7%	122,223	Jun-27	162,964	Nov-21
Alt. 3	7%	69,304	Feb-15	92,405	Jul-3
Alt. 4	7%	97,595	Jun-3	130,126	Sep-5
Alt. 5	7%	88,025	Feb-25	117,366	Aug-8

While it is possible the change to the recreational fishing year and fixed closed season and the reduction and the commercial trip limit may have prevented in-season closures for 2021 and 2021, harvest reductions considered in this document are expected to lead to an in-season closure for both sectors. Given the short projected season for the recreational sector, the time lag in receiving recreational landings, and projected mid-year closure for the commercial sector, **Alternatives 1** and **3** would likely have similar effects and result in more positive effects for the stock than **Alternative 2**. Retaining the higher buffer for the recreational sector (17%) would reduce the likelihood of exceeding the recreational ACL. Even though this would result in a longer closure and may increase discards, it is expected to result in greater positive effects for the stock because discards and discard mortality for this sector are expected to remain low (10%). Even though only a 5% reduction in the recreational buffer is proposed under **Alternative 2**, this could result in slightly more adverse effects than the other two alternatives due to the uncertainty in landings estimates. However, given the constraints associated with monitoring recreational data to relatively small values and the small variance in the closure projection date under the various alternatives, the increased chance of exceeding the recreational ACL under **Alternative 2** is expected to be negligible.

4.2.3 Direct and Indirect Effects on the Economic Environment

Alternative 1 (No Action) would maintain the current buffer between the ACL and ACT for each sector. Therefore, **Alternative 1** would not be expected to affect fishing practices or recreational and commercial harvests of greater amberjack and would not be expected to result in economic effects. **Alternatives 2** and **3** use different time series for the ACL/ACT control rule to determine the commercial and recreational buffers between the sector-specific ACLs and ACTs.

For the recreational and commercial sectors, other things equal, a narrower buffer between the ACL and the ACT would be expected to result in increased potential economic benefits due to increased fishing opportunities afforded to the sectors' fishermen. Conversely, a wider buffer would be expected to reduce fishing opportunities and therefore could result in adverse economic effects such as losses in economic value. However, a wider buffer reduces the likelihood of exceeding the ACL, which would result in a payback (reduction of the catch limits) in the following year.

For the recreational sector, **Alternative 3** would set the same buffer as the status quo alternative (**Alternative 1**). Therefore, **Alternative 3** would not be expected to result in economic effects for the recreational sector. **Alternative 2** proposes to reduce the recreational buffer between the ACL and ACT from 17% to 13%. This smaller buffer would therefore be expected to expand fishing opportunities in the recreational sector and result in increased economic value should recreational anglers take advantage of the increased opportunities.

For the commercial sector, **Alternatives 2** and **3** would both reduce the buffer between the commercial ACL and ACT from 13% to 7%; thereby potentially affording additional fishing opportunities to commercial fishermen. Should commercial fishermen increase their landings by

taking advantage of these opportunities, the narrowing of the buffer would result in increased economic benefits. In addition to the qualitative discussion provided in this section, the Regulatory Impact Review is expected to quantify the combined economic effects of the preferred ACL reductions (Action 1) and buffers (Action 2).

4.2.4 Direct and Indirect Effects on the Social Environment

Additional effects would not be expected under **Alternative 1** (No Action), which would maintain the current buffer between the ACL and ACT for each sector and not affect fishing activities. **Alternatives 2** and **3** use different time series for the ACL/ACT control rule to determine the buffers between each sector's ACL and ACT. In general, a smaller buffer between the ACL and the ACT would be expected to result in greater positive social effects in the short term as more fishing opportunities are provided before the ACT is met. At the same time, using a smaller buffer could increase the likeliness that the ACL is exceeded, triggering a post-season AM, which would decrease the amount of fish available to be caught in the following fishing year. A larger buffer would be expected to reduce fishing opportunities in the short term, resulting in greater negative effects in the short-term, but decreasing the likeliness that the ACL would be exceeded, triggering the post-season AM.

For the recreational sector, there would be no additional effects from **Alternative 3**, which would retain the same 17% buffer as **Alternative 1**. **Alternative 2** would reduce the recreational buffer between the ACL and ACT from 17% to 13%. Some positive effects may be expected from **Alternative 2** compared to **Alternative 1** for the recreational sector, as additional fishing opportunities would be available before the fishing season is closed when the ACT is estimated to be met.

For the commercial sector, both **Alternatives 2** and **3** would reduce the buffer between the commercial ACL and ACT from 13% to 7%, and the effects would be expected to be the same. Some positive effects may be expected from **Alternatives 2** or **3** compared to **Alternative 1**, as additional harvest opportunities are available before the fishing season is closed and further harvest prohibited. Although a smaller buffer would usually be associated with an increased likeliness for the ACL to be exceeded, the commercial harvest of greater amberjack is managed with a trip limit step down that reduces the trip limit from 1,000 lbs gw to 250 lbs gw when 75% of the commercial ACL is harvested. The step down slows the rate of harvest and decreases the likeliness that the commercial sector ACL is exceeded.

4.2.5 Direct and Indirect Effects on the Administrative Environment

Action 2 would affect the administrative environment mostly through in-season closures for both sectors that are more likely to be triggered than under current management. Closure of the recreational or commercial sectors for greater amberjack would only have minor effects on the administrative environment as closures already occur for reef fish species. Further, changing the ACT would increase the burden for NMFS, which would have to engage in rulemaking to implement this change in management, although this change is routine and considered minimal. **Alternatives 1-3** are all projected to result in in-season closures for both sectors and a need to change the ACT, so effects are expected to be the same.

There is no effect on the administrative burden for law enforcement as law enforcement officers do not monitor catch limits, but would only continue to monitor compliance with any established closed season. Some administrative burden is anticipated under **Alternatives 1-3** with respect to outreach as it relates to notifying stakeholders of the changes to the ACT. None of the expected effects are expected to be significant.

4.3 Cumulative Effects Analysis

While this environmental assessment (EA) is being prepared using the 2020 Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations, the cumulative effects discussed in this section meet the two-part standard for "reasonable foreseeability" and "reasonably close causal connection" required by the 2020 definition of effects or impacts. Below is our five-step cumulative effects analysis that identifies criteria that must be considered in an EA.

1. *The area in which the effects of the proposed action will occur* - The affected area of this proposed action encompasses the state and federal waters of the Gulf as well as Gulf communities that are dependent on reef fish fishing. Most relevant to this proposed action is greater amberjack and those who fish for them. For more information about the area in which the effects of this proposed action will occur, please see Chapter 3, Affected Environment, which describes these important resources as well as other relevant features of the human environment.

2. *The impacts that are expected in that area from the proposed action* - The proposed action would modify greater amberjack catch limits. The physical/biological consequences of the proposed action are analyzed in Section 4.1.1. 4.2.1, 4.2.1 and 4.2.2 and are not expected to be significant. Modifying the catch limits is not expected to have effects on the physical environment as is not expected to alter the manner in which the greater amberjack portion of the reef fish fishery is prosecuted (Sections 4.1.1 and 4.2.1). It is expected to have positive effects on the biological environment because the action would reduce harvest, which would reduce overfishing, allow the greater amberjack spawning stock biomass to increase, and increase the probability of meeting rebuilding on the current timeline (Section 4.1.2 and 4.2.2). Since greater amberjack is often part of a multi-species fishing strategy and fishermen can specifically target them, bycatch mortality is expected to remain the same, even with the projected decreased open season. Further, changing fishing practices on one stock does not generally change overall fishing effort or fishing practices. This action would likely have some negative short term effects on the social and economic environments (Sections 4.1.3, 4.1.4, 4.2.3, and 4.2.4). While a short-term negative effect on the social and economic environment due to decreased catch limits and subsequent decreased open season, addressing the overfishing status of the stock and meeting rebuilding on time is expected to have positive long-term effects with increased catch limits. The proposed action is not expected to significantly affect the administrative environment (Section 4.1.5 and 4.2.5), adversely or beneficially.

3. *Other past, present and reasonably foreseeable future actions (RFFAs) that have or are expected to have impacts in the area* - There are numerous actions under development in the Gulf annually. Many of these activities are expected to have impacts associated with them and are listed below.

Other fishery related actions - The cumulative effects associated with modifying the greater amberjack catch limits were analyzed in the EAs for Amendments 30A (GMFMC 2008), Amendment 35 (GMFMC 2012), and two Framework Actions (GMFMC 2015 and 2017a) to the Reef Fish FMP. These cumulative effects analyses are incorporated here by reference. Other pertinent past actions related to the management of greater amberjack are summarized in the history of management (Section 1.3). Currently, there are a few present actions and RFFAs that are being developed by the Councils that could affect Reef Fish stocks. These include: Reef Fish, Amendment 55, which proposes to revise yellowtail snapper catch limits, Amendment 56, which proposes to revise gag grouper allocations and catch limits, an interim rule to modify gag allocation and catch limits, a framework that proposes to modify the vermilion snapper bag limit and gray triggerfish fixed closed season and trip limit, a second framework that proposes to modify red snapper catch limits, a generic framework, which would modify the Gulf of Mexico Fishery Management Council's Acceptable Biological Catch Control Rule, and a generic framework that addresses essential fish habitat. Documents being considered for implementation by NMFS that could affect reef fish stocks include a framework that addresses red snapper calibration and recreational catch limits, a framework that proposes to modify red snapper catch limits, and a framework to modify vermilion snapper catch limits.[34]

Non-fishery related actions - Actions affecting the reef fish fishery have been described in previous cumulative effect analyses. Three important events include impacts of the *Deepwater Horizon* MC252 oil spill, the Northern Gulf Hypoxic Zone, and climate change (See Sections 3.1 and 3.2).

4. The impacts or expected impacts from these other actions - The cumulative effects from managing the reef fish fishery have been analyzed in multiple other actions.[35] They include detailed analysis of the reef fish fishery, cumulative effects on non-target species, protected species, and habitats in the Gulf. In general, the effects of these actions are positive as they ultimately act to restore/maintain the stocks at a level that will allow the maximum benefits in yield and recreational fishing opportunities to be achieved. However, for actions that reduce allowable harvest, some short-term negative impacts on the fisheries' social and economic environments may occur due to the need to limit directed harvest and reduce bycatch mortality. These negative impacts can be minimized by using combinations of management measures that provide the least disruption to the fishery while holding harvest to sustainable levels. None of the present and RFFAs under the Reef Fish FMP, identified above, are expected to affect how the reef fish fishery as a whole is prosecuted.

Impacts from the *Deepwater Horizon* MC252 oil spill are still being examined; however, as indicated in Section 3.3, the oil spill had some adverse effects on fish species. Further, the impacts on the food web from phytoplankton, to zooplankton, to mollusks, to top predators may be significant in the future. Impacts to greater amberjack from the oil spill may similarly affect other species that may be preyed upon by greater amberjack. However, since the majority of the spawning biomass for greater amberjack occurs outside the main areas affected by the *Deepwater Horizon* MC252 oil spill plume, it is less likely that a direct effect on this species will be detected. Greater amberjack are a mobile species and are able to avoid hypoxic conditions, so

[34] http://gulfcouncil.org
[35] https://gulfcouncil.org/reef-fish/

any effects from the Northern Gulf Hypoxic Zone on greater amberjack species are likely minimal.

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.[36] Global climate changes could affect the Gulf fisheries as discussed in Sections 3.2 and 3.3. 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. The proposed action is not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing, as this action should not change how the fishery is prosecuted. As described in Section 3.2, the contribution to greenhouse gas emissions from fishing is minor compared to other emission sources (e.g., oil platforms).

5. *The overall impact that can be expected if the individual impacts are allowed to accumulate:* This action, combined with other past actions, present actions, and RFFAs, is not expected to have significant beneficial or adverse effects on the physical and biological environments. Any effects are expected to be positive, but are not expected to substantially change the manner in which the reef fish fishery is prosecuted as a whole (Sections 4.1.1, 4.1.2, 4.2.1, and 4.2.2). For the social and economic environments, some short term negative effects are expected to result for fishing communities from reduced harvest and subsequent reduced season length, however, positive effects are expected long term (Sections 4.1.3, 4.1.4, 4.2.3, and 4.2.4). Furthermore, it is likely that fishing trips would occur regardless of whether greater amberjack is open of harvest, as recreational fishing for greater amberjack is generally part of a multi-species fishing strategy and commercial fishing seems to have shifted into a more multi-species fishing strategy as well. Fisherman can also switch to targeting other species when greater amberjack harvest is closed. Because it is unlikely there would be any changes in how the reef fish fishery is prosecuted, this action, combined with past actions, present actions, and RFFAs, is not expected to have significant adverse effects on public health or safety.

6. Summary: The proposed action is not expected to have individual significant effects to the physical, biological, economic, or social environments. Any effects of the proposed action, when combined with other past actions, present actions, and RFFAs are not expected to be significant. The effects of the proposed action are, and will continue to be, monitored through collection of landings data by NMFS, individual state programs, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. Landings data for the commercial sector in the Gulf are collected through trip ticket programs, port samplers, and logbook programs. Landings data for the recreational sector in the Gulf are collected through the MRIP, Louisiana Creel Survey, Southeast Region Headboat

[36] http://www.ipcc.ch/publications_and_data/publications_and_data.shtml

Survey, and Texas Parks and Wildlife Department. The cumulative social and economic effects of past, present, and future amendments may be described as limiting fishing opportunities in the short-term, but increasing fishing opportunities in the long-term, resulting in positive social and economic impacts. The proposed actions in this amendment are expected to result in some important long-term benefits to the commercial and for-hire fishing fleets, fishing communities and associated businesses, and private recreational anglers. Limiting harvest now is expected to allow for greater harvest in the future. The proposed changes in management for Gulf greater amberjack would contribute to changes in the fishery within the context of the current economic and regulatory environment at the local and regional level. This analysis found positive effects on the biophysical environments because it would reduce harvest of the greater amberjack stock, thereby allowing population levels to increase and assist with meeting rebuilding by 2027. Short term negative socioeconomic effects are expected, but are regarded as minimal due to the long-term positive effects that are expected with the stock meeting rebuilding.

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APPENDIX A. CHANGES TO RECREATIONAL DATA COLLECTION

Changes to the Recreational Data Collection Survey

The Marine Recreational Fisheries Statistics Survey (MRFSS) was created in 1979 by NMFS. In the Gulf, MRFSS collected data on catch and effort in recreational fisheries, including greater amberjack, since 1981. The program included the APAIS, which consists of onsite interviews at marinas and other points where recreational anglers fish, to determine catch. MRFSS also included CHTS, which used random-digit dialing of homes in coastal counties to contact anglers to determine fishing effort. In 2000, the For-Hire Survey (FHS) was implemented to incorporate for-hire effort due to lack of coverage of charter boat anglers by the CHTS. The FHS used a directory of all known charter boats and a weekly telephone sample of the charter boat operators to obtain effort information.

MRFSS included both offsite telephone surveys and onsite interviews at marinas and other points where recreational anglers fish. In 2012 a new design was certified and subsequently implemented in 2013: MRIP replaced MRFSS to meet increasing demand for more precise, accurate, and timely recreational catch estimates. MRIP is a more scientifically sound methodology for estimating catch because it reduces some sources of potential bias as compared to MRFSS resulting in more accurate catch estimates. Specifically, CHTS was improved to better estimate private angling effort. Instead of random telephone calls, MRIP-CHTS used targeted calls to anglers registered with a federal or state saltwater fishing registry. The MRIP Access Point Angler Intercept Survey (APAIS) began incorporating a new survey design in 2013. This new design addressed concerns regarding the validity of the survey approach, specifically that trips recorded during a given time period are representative of trips for a full day (Foster et al. 2018). The more complete temporal coverage with the new survey design provides for consistent increases or decreases in APAIS angler catch rate statistics, which are used in stock assessments and management, for at least some species (NOAA Fisheries 2019). In 2018, NOAA Fisheries convened a peer review of a method of producing revised historical catch statistics that are comparable to those produced by the improved APAIS.[37]

MRIP also transitioned from the legacy Coastal Household Telephone Survey (CHTS) to a new mail survey (Fishing Effort Survey, FES) beginning in 2015, and in 2018, the FES replaced the CHTS. Both survey methods collect data needed to estimate marine recreational fishing effort (number of fishing trips) by shore and private/rental boat anglers on the Atlantic and Gulf coasts. The CHTS used random-digit dialing of homes in coastal counties to contact anglers. The new mail-based FES uses angler license and registration information as one way to identify and

[37] https://www.fisheries.noaa.gov/event/access-point-angler-intercept-survey-calibration-workshop

contact anglers (supplemented with data from the U.S. Postal Service, which includes virtually all U.S. households). Because the FES and CHTS are so different, NMFS conducted side-by side testing of the two methods from 2015 to 2018 and developed calibration procedures to convert the historical catch estimates (MRFSS, MRIP-CHTS, MRIP-APAIS [collectively MRFSS]) into MRIP-FES. This calibration model was peer reviewed in 2017[38] and the Council's Scientific and Statistical Committee reviewed the model at a July 8-9, 2020, meeting.[39] In general, landings estimates are higher, and in some cases substantially higher, using the MRIP-FES as compared to the CHTS estimates. This is because the FES is designed to more accurately measure fishing activity than the CHTS, not because there was a sudden rise in fishing effort. NMFS developed a calibration model to adjust historic effort estimates so that they can be accurately compared to new estimates from the FES. The new effort estimates alone do not lead to definitive conclusions about stock size or status in the past or at current. NMFS determined that the MRIP-FES data, when fully calibrated to ensure comparability among years and across states, produced the best available data for use in stock assessments and management (NOAA Fisheries 2019). Table 1.1.3 in Draft Amendment 54 provides Gulf greater amberjack landings for 1981 through 2020 fishing years comparing MRIP-CHTS harvest data to MRIP-FES harvest data. While stock total landings in MRIP-FES are provided, only stock total landings in MRIP-CHTS should be compared to the total stock ACL.

Reference:

NOAA Fisheries. Office of Science & Technology; Southeast Fisheries Science Center; Southeast Regional Office. 2019. Recommended use of the current Gulf of Mexico surveys of marine recreational fishing in stock assessments. 32 pp.

[38] https://www.fisheries.noaa.gov/event/fishing-effort-survey-calibration-model-peer-review
[39] https://gulfcouncil.org/ssc/archive/

APPENDIX B. ACL/ACT CONTROL RULE FOR THE RECREATIONAL SECTOR USING YEARS 2017-2020

As of 03/23/2022				**Greater Amberjack**	
ACL/ACT Buffer Spreadsheet			version 4.1 - April 2011	**Sector: Recreational**	
sum of points	3.5			**Years: 2017-2020**	
max points	6.5		Buffer between ACL and ACT (or ABC and ACL)	Unweighted	10
Min. Buffer	**0**	**min. buffer**	User adjustable	Weighted	**13**
Max Unw.Buff	19	max unwt. Buff			
Max Wtd Buff	**25**	**max wtd. buffer**	User adjustable		

Component	Element score	Element	Selection	Element result
Stock assemblage	0	This ACL/ACT is for a single stock.	x	0
	1	This ACL/ACT is for a stock assemblage, or an indicator species for a stock assemblage		
Ability to Constrain Catch	0	Catch limit has been exceeded 0 or 1 times in last 4 years	x	1.5
	1	Catch limit has been exceeded 2 or more times in last 4 years		
		For the year with max. overage, add 0.5 pts. For every 10 percentage points (rounded up) above ACL	1.5	
		Not applicable (there is no catch limit)		
		Apply this component to recreational fisheries, not commercial or IFQ fisheries		
Precision of Landings Data Recreational	0	Method of absolute counting		2
	1	MRIP proportional standard error (PSE) <= 20		
	2	MRIP proportional standard error (PSE) > 20	x	
		Not applicable (will not be included in buffer calculation)		
		Apply this component to commercial fisheries or any fishery under an IFQ program		
Precision of Landings Data Commercial	0	Landings from IFQ program		not applicable
	1	Landings based on dealer reporting		
	2	Landings based on other		
		Not applicable (will not be included in buffer calculation)	x	
Timeliness	0	In-season accountability measures used or fishery is under an IFQ	x	0
	1	In-season accountability measures not used		
			Sum	3.5

Weighting factor				
	Element weight	Element	Selection	Weighting
Overfished status	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 (MSST).		
	0.3	4. Stock is overfished, below MSST.	x	
	0.3	5. Status criterion is unknown.		

APPENDIX C. ACL/ACT CONTROL RULE FOR THE COMMERCIAL SECTOR USING YEARS 2017-2020

ACL/ACT Buffer Spreadsheet			version 4.1 - April 2011	Sector: Commercial	
sum of points	1.5			Years: 2017-2020	
max points	5.5		Buffer between ACL and ACT (or ABC and ACL)	Unweighted	5
Min. Buffer	**0**	**min. buffer**	User adjustable	Weighted	**7**
Max Unw.Buff	19	max unwt. Buff			
Max Wtd Buff	**25**	**max wtd. buffer**	User adjustable		

Component	Element score	Element	Selection	Element result
Stock assemblage	0	This ACL/ACT is for a single stock.	x	0
	1	This ACL/ACT is for a stock assemblage, or an indicator species for a stock assemblage		
Ability to Constrain Catch	0	Catch limit has been exceeded 0 or 1 times in last 4 years	x	0.5
	1	Catch limit has been exceeded 2 or more times in last 4 years		
		For the year with max. overage, add 0.5 pts. For every 10 percentage points (rounded up) above ACL	0.5	
		Not applicable (there is no catch limit)		
		Apply this component to recreational fisheries, not commercial or IFQ fisheries		
	0	Method of absolute counting		not applicable
Precision of Landings Data Recreational	1	MRIP proportional standard error (PSE) <= 20		
	2	MRIP proportional standard error (PSE) > 20		
		Not applicable (will not be included in buffer calculation)	x	
		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	Landings based on dealer reporting	x	
	2	Landings based on other		
		Not applicable (will not be included in buffer calculation)		
Timeliness	0	In-season accountability measures used or fishery is under an IFQ	x	0
	1	In-season accountability measures not used		
			Sum	1.5

Weighting factor				
	Element weight	Element	Selection	Weighting
Overfished status	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 (MSST).		
	0.3	4. Stock is overfished, below MSST.	x	
	0.3	5. Status criterion is unknown.		

APPENDIX D. ACL/ACT CONTROL RULE FOR THE RECREATIONAL SECTOR USING YEARS 2016-2019

sum of points	4.5			**Years: 2016-2019**	
max points	6.5		Buffer between ACL and ACT (or ABC and ACL)	Unweighted	13
Min. Buffer	**0**	**min. buffer**	User adjustable	Weighted	**17**
Max Unw.Buff	19	max unwt. Buff			
Max Wtd Buff	**25**	**max wtd. buffer**	User adjustable		

Component	Element score	Element	Selection	Element result
Stock assemblage	0	This ACL/ACT is for a single stock.	x	0
	1	This ACL/ACT is for a stock assemblage, or an indicator species for a stock assemblage		
Ability to Constrain Catch	0	Catch limit has been exceeded 0 or 1 times in last 4 years		2.5
	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	1.5	
		Not applicable (there is no catch limit)		
		Apply this component to recreational fisheries, not commercial or IFQ fisheries		
	0	Method of absolute counting		2
Precision of	1	MRIP proportional standard error (PSE) <= 20		
Landings Data	2	MRIP proportional standard error (PSE) > 20	x	
Recreational		Not applicable (will not be included in buffer calculation)		
		Apply this component to commercial fisheries or any fishery under an IFQ program		
Precision of	0	Landings from IFQ program		not applicable
	1	Landings based on dealer reporting		
Landings Data	2	Landings based on other		
Commercial		Not applicable (will not be included in buffer calculation)	x	
Timeliness	0	In-season accountability measures used or fishery is under an IFQ	x	0
	1	In-season accountability measures not used		
			Sum	4.5

Weighting factor

	Element weight	Element	Selection	Weighting
Overfished status	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 (MSST).		
	0.3	4. Stock is overfished, below MSST.	x	
	0.3	5. Status criterion is unknown.		

APPENDIX E. ACL/ACT CONTROL RULE FOR THE COMMERCIAL SECTOR USING YEARS 2016-2019

As of 03/23/2022				**Greater Amberjack**	
ACL/ACT Buffer Spreadsheet			version 4.1 - April 2011	**Sector: Commercial**	
sum of points	1.5			**Years: 2016-2019**	
max points	5.5		Buffer between ACL and ACT (or ABC and ACL)	Unweighted	5
Min. Buffer	**0**	**min. buffer**	User adjustable	Weighted	**7**
Max Unw.Buff	19	max unwt. Buff			
Max Wtd Buff	**25**	**max wtd. buffer**	User adjustable		

Component	Element score	Element	Selection	Element result
Stock assemblage	0	This ACL/ACT is for a single stock.	x	0
	1	This ACL/ACT is for a stock assemblage, or an indicator species for a stock assemblage		
Ability to Constrain Catch	0	Catch limit has been exceeded 0 or 1 times in last 4 years	x	0.5
	1	Catch limit has been exceeded 2 or more times in last 4 years		
		For the year with max. overage, add 0.5 pts. for every 10 percentage points (rounded up) above ACL	0.5	
		Not applicable (there is no catch limit)		
		Apply this component to recreational fisheries, not commercial or IFQ fisheries		
Precision of Landings Data Recreational	0	Method of absolute counting		not applicable
	1	MRIP proportional standard error (PSE) <= 20		
	2	MRIP proportional standard error (PSE) > 20		
		Not applicable (will not be included in buffer calculation)	x	
		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	Landings based on dealer reporting	x	
	2	Landings based on other		
		Not applicable (will not be included in buffer calculation)		
Timeliness	0	In-season accountability measures used or fishery is under an IFQ	x	0
	1	In-season accountability measures not used		
			Sum	1.5

Weighting factor

	Element weight	Element	Selection	Weighting
Overfished status	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 (MSST).		
	0.3	4. Stock is overfished, below MSST.	x	
	0.3	5. Status criterion is unknown.		

APPENDIX F. ALTERNATIVES CONSIDERED BUT REJECTED

At its June 2022 meeting, **Alternative 6** was removed from Action 1 it did not adequately consider historical participation of the commercial and recreational sectors and thus, was not consistent with the purpose and need.

Alternative 6: Revise the allocation between the recreational and commercial sectors, such that the commercial ACL is retained at 484,380 lbs ww in 2022 resulting in an allocation equal to 24.4% recreational and 75.6% commercial in 2022. Maintain the recreational allocation at 24.4% recreational and 75.6% commercial thereafter. Set the total stock ACL equal to the ABC.

Year	OFL	ABC	Total ACL	Rec ACL	Com ACL	Allocation (Rec:Com)
2022	2,028,000	641,000	641,000	156,620	484,380	24.4:75.6
2023	2,160,000	757,000	757,000	184,963	572,037	24.4:75.6
2024	2,265,000	870,000	870,000	212,573	657,427	24.4:75.6
2025	2,339,000	970,000	970,000	237,007	732,993	24.4:75.6
2026	2,389,000	1,055,000	1,055,000	257,776	797,224	24.4:75.6
2027	2,423,000	1,124,000	1,124,000	274,635	849,365	24.4:75.6

Note: Values are in lbs ww. The recreational portion of the OFL, ABC, total ACL and ACL are based on MRIP-FES data.

APPENDIX G. GULF GREATER AMBERJACK RECREATIONAL PROJECTION

Predicting Closure Dates for the Gulf of Mexico Greater Amberjack Recreational Sector

Introduction

Greater amberjack (*Seriola dumerili*) are one of 31 reef fish species managed by the Gulf of Mexico Fishery Management Council (Council). Greater amberjack are in the Council's 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 2020, a stock assessment was conducted for the Gulf of Mexico greater amberjack (SEDAR 70). Results from the assessment showed the greater amberjack stock is overfished and experiencing overfishing. An Emergency Rule is currently being drafted and its purpose is to restrict harvest by modifying the recreational fixed closed seasons. The current management measures for the recreational sector are a closed fixed season from November 1 through April 30 and June 1 through July 31, minimum size of 34 inches fork length, and one greater amberjack per angler bag limit. Additionally, the current fishing year is from August 1st to July 31st.

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). These data were provided from the SEFSC on March 17, 2022, and following SEDAR 70 the MRIP data used is from the Fishing Effort Survey. MRIP, TPWD, and LA Creel conducted dockside intercepts to collect information on the size and number of greater amberjack. Headboat collected size and number of greater amberjack through logbooks completed by headboat operators.

Predicted Landings

The proposed Reef Fish Amendment 54 has 2023 catch limits assigned to the 2022/2023 recreational fishing year. An estimate of future landings are required to explore the impact on the recreational season length from implementing new ACTs. The greater amberjack recreational fishery has had several regulatory changes over the past seven years. For example there have been changes to the start of the fishing year, bag limit, size limit, and changes to the periods of time when the recreational sector was open. Additionally, there have been numerous closures of the recreational sector since 2014, however, there has not been a closure of the recreational sector in the fishing years of 2019/2020, 2020/2021, and 2021/2022. Since the recreational sector has had numerous regulation changes and closures over the past seven years it was assumed that landings in recent years are the best predictor of future landings. Since the recent recreational landings from the fishing years of 2019/2020, 2020/2021, and 2021/2022 did not have any new regulation changes or recreational closures these data were used to predict

future landings. The landings were separated from two-month waves into single months by assuming the landings were uniform within a wave. However, if one of the months in a wave had a fixed closure then it was assumed all of the landings in that wave came from the open month in the wave. For example, the recreational sector has a fixed closure of July so all of the landings from the July/August wave were assumed to come from August. Predicted August through October recreational landings came from a three-year average of monthly landings from 2019, 2020, and 2021. Predicted May recreational landings came from a two-year average of 2020 and 2021 May landings. Only two years of landings were used to make a prediction for May because the recreational sector was closed in May in 2019 and the 2022 May landings are not available at this time. The average landings by month are provided in Table 1. Figure 1 provides the landings used in the analysis.

Table 1. Calculated average recreational landings by month using Gulf of Mexico greater amberjack recreational landings from the 2019/2020, 2020/2021, 2021/2022 fishing years for the months of August, September, and October.

Month	Average Landings
August	532,232
September	170,825
October	176,519
May	261,506

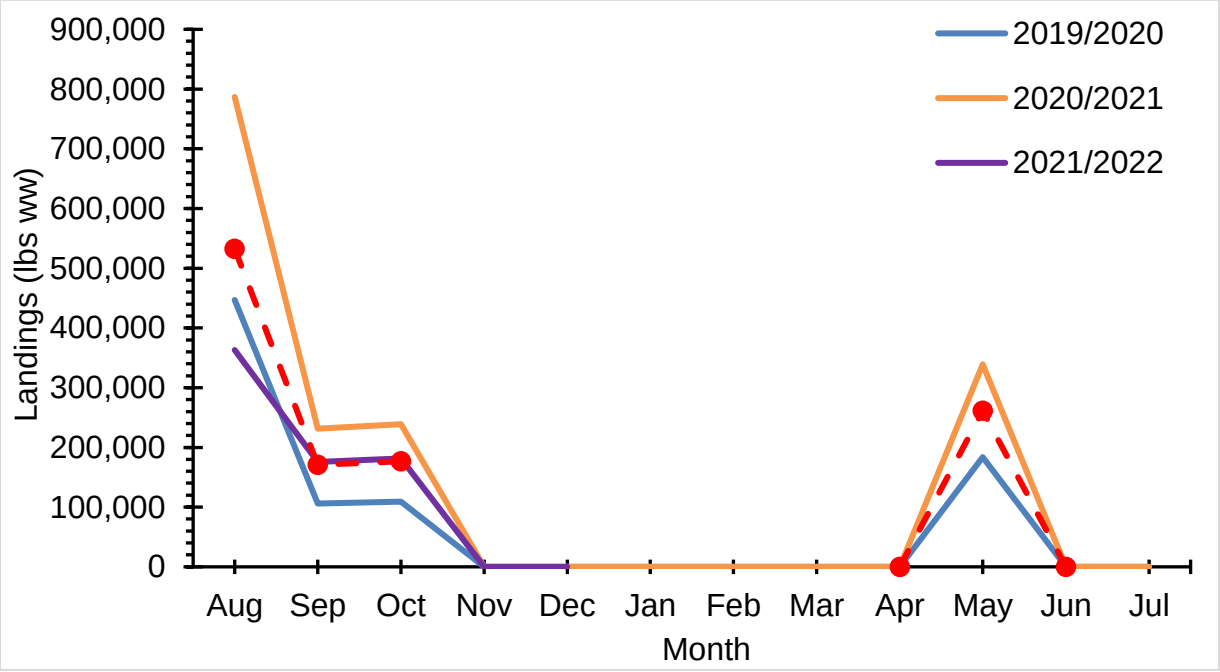

Figure 1. Gulf of Mexico greater amberjack recreational landings by month for available 2019/2020, 2020/2021, 2021/2022 fishing years, and also an average of these landings. May only has landings from 2020 and 2021 because the recreational sector was closed in 2019 and May 2022 landings are not available at this time. All landings are in pounds whole weight (lbs ww).

Predicted Closure Dates

Closure dates were determined from cumulatively summing the average landings and comparing them to the proposed 2023 ACTs stated in Reef Fish Amendment 54. Table 2 provides the predicted closure dates under the various proposed 2023 ACT alternatives in Reef Fish Amendment 54 with the fishing season starting August 1st. Due to the predicted high landings in August (> 500,000 pounds) all of the proposed 2023 ACT alternatives are expected to be met and exceeded in August.

Table 2. The projected dates the proposed 2023 ACT would be met for the greater amberjack recreational sector for a range of 2023 ACTs being considered in Reef Fish Amendment 54. The ACT met dates assume the recreational sector open only the month of August. The ACTs are in pounds whole weight.

ACL Buffer	2023 ACT	ACT Met Date
17%	393,229	23-Aug
17%	432,961	26-Aug
17%	411,746	24-Aug
17%	418,984	25-Aug
13%	412,180	25-Aug
13%	453,827	27-Aug
13%	431,590	26-Aug
13%	439,176	26-Aug

References

SEDAR 70. 2020. Stock assessment report Gulf of Mexico greater amberjack (*Seriola dumerili*). Southeast Data, Assessment and Review. North Charleston, South Carolina. http://www.sefsc.noaa.gov/sedar/.

APPENDIX H. GULF GREATER AMBERJACK COMMERCIAL PROJECTION

Gulf of Mexico Greater Amberjack Commercial Sector Season Length Prediction Analyses

In 2020, a stock assessment was conducted for the Gulf of Mexico greater amberjack (SEDAR 70). Results from the assessment showed the Gulf of Mexico greater amberjack stock is overfished and experiencing overfishing. An analysis of recent commercial landings were done to predict if the ACTs being considered in Reef Fish Amendment 54 would be reached.

The current management measures for the commercial sector are a closed fixed season from March 1 through May 31, a minimum size limit of 36 inches, a 1,000 pounds gutted weight (lbs gw) trip limit, and a reduction of the trip limit down to 250 lbs gw when 75% of the ACT is reached.

Predicting Commercial Landings

Commercial landings data for Gulf of Mexico greater amberjack were obtained from the Southeast Fisheries Science Center (SEFSC) on April 5, 2022. These commercial landings contained historical Gulf of Mexico greater amberjack landings up to the end of February 2022. Future commercial landings were predicted from reviewing recent commercial landings data. In May of 2020 a Framework Action reduced the trip limit from 1,500 lbs gw down to 1,000 lbs gw with an additional step down to 250 lbs gw once 75% of the ACT had been met. This new trip limit (1,500 lbs gw reduced to 1,000 lbs gw) was analyzed for the Framework Action and expected to reduce commercial harvest by about 18%. To keep the commercial landing analysis consistent with future landings only landings after the implementation of the new Framework Action trip limit were used. Therefore, only commercial landings after May 2020 were used in the analysis. Monthly commercial landings for January and February came from the average monthly landings from 2021 and 2022. The average landings for January and February are provided in Table 1. No commercial landings predictions were made for March 1 through May 31 because in 1998 Amendment 15 implemented a fixed commercial closure for this time period. Landings from June through December were an average of monthly landings from 2020 and 2021. The commercial landings used in this analysis are shown in Figure 1.

Table 1. Calculated average commercial landings by month using Gulf of Mexico greater amberjack commercial landings from the 2021 and 2022 fishing years for January and February.

Month	Average Landings
January	42,114
February	52,953
June	
July	
August	

September	
October	
November	
December	

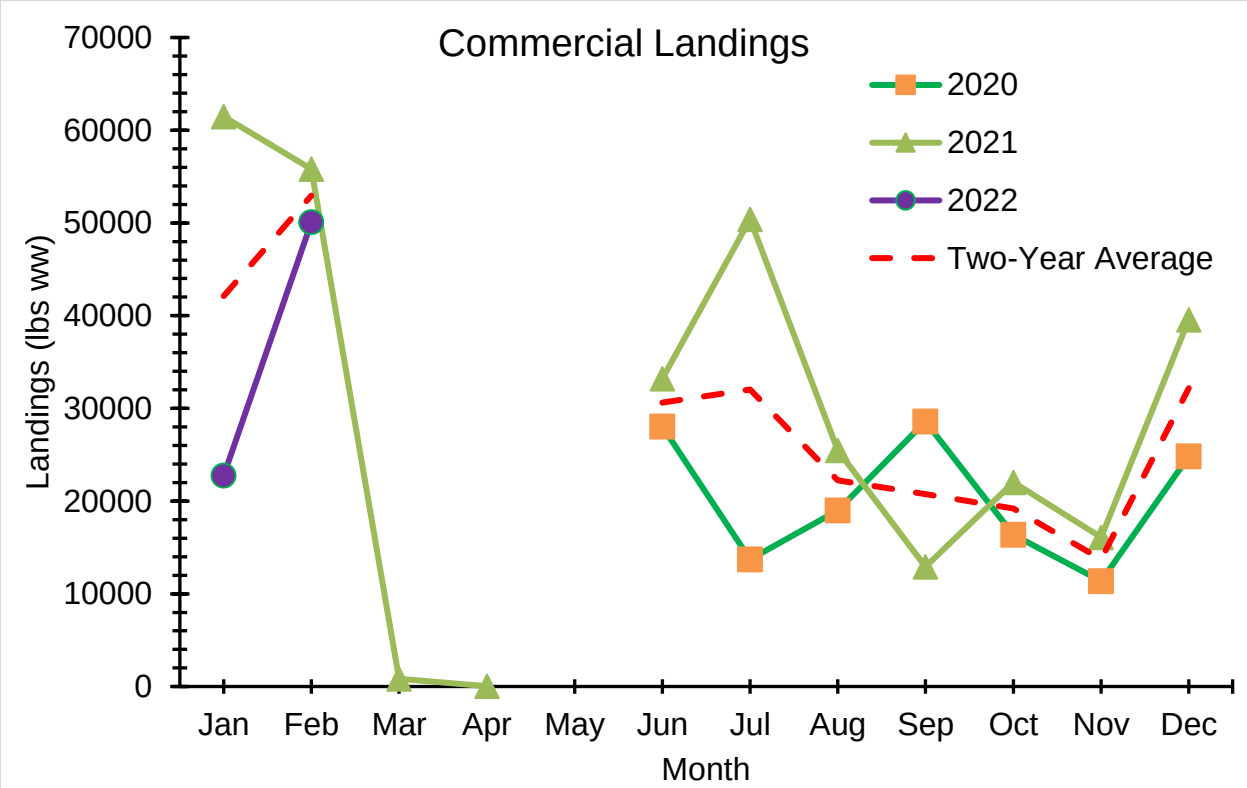

Figure 1. Gulf of Mexico greater amberjack commercial landings by month for 2020, 2021, 2022, and the calculated two-year average. Specific monthly landings for each year were chosen due to the commercial fishery being open for the entire month, and these landings occurred after the May of 2020 implementation of 1,000 lbs gw trip limit from a Framework Action. All landings are in pounds whole weight.

Predicting Reduction of Landings from the Reduced Trip Limit Down to 250 Pounds

The current regulations have a trip limit of 1,000 lbs gw that is reduced down to 250 lbs gw when 75% of the ACT has been met. Commercial logbook data was used to evaluate the impact the trip limit reduction will have on the commercial landings. Commercial logbook landings were provided from the SEFSC on May 6, 2021. In May of 2020 a Framework Action reduced the trip limit from 1,500 down to 1,000 pounds. To understand the current distribution of greater amberjack harvest per trip with the newly imposed 1,000 lbs gw trip limit and the impact of reducing the trip limit to 250 lbs gw only commercial logbook data after May 2020 were used. Available greater amberjack commercial logbook data from May 2020 to the current logbook dataset resulted in 120 Gulf of Mexico commercial trips that harvested greater amberjack. The distribution of the greater amberjack harvested per trip are shown in Figure 2. Landing reductions for reducing the trip limit from 1,000 lbs gw down to 250 lbs gw were estimated by

normalizing all trips that harvested greater amberjack that were above the 250 lbs gw trip limit. For example, to determine the percent reduction in landings if a 250 lbs gw trip limit were imposed, trips with greater amberjack harvest greater than 250 lbs gw were normalized to have harvested only 250 lbs gw, and a new total landings was calculated to compare with landings under current limits. This resulted in a calculated reduction of commercial landings of 62.2% for the reduced trip limit from 1,000 down to 250 lbs gw.

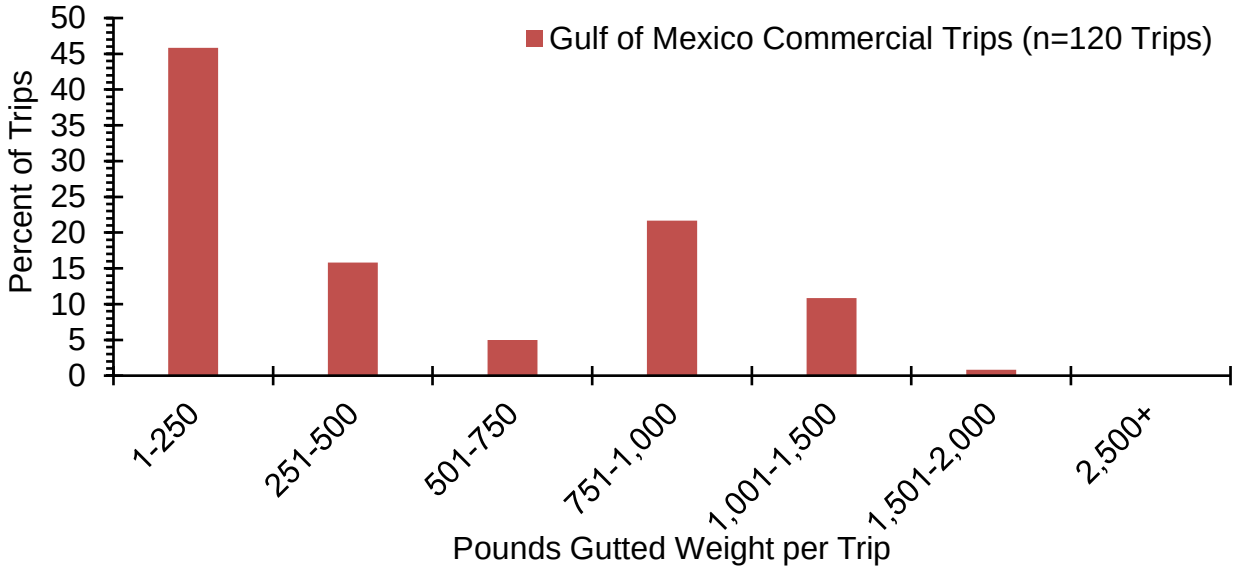

Figure 2. The percent of commercial trips (n=120) harvesting Gulf of Mexico greater amberjack by weight bin from June 2020 to May 2021. Source: SEFSC commercial logbook (May 6, 2021).

Predicting Closure Dates

Action 2 of Reef Fish Amendment 54 is exploring a range of commercial ACTs. Several of the alternatives of Action 2 have a range of commercial ACTs, however, to simplify this analysis only the ACT alternatives for the year 2023 were used. Only 2023 proposed Reef Fish Amendment 54 ACTs were analyzed since this is the fishing year when Reef Fish Amendment 54 is expected to be effective. The average commercial landings were assumed to reflect future greater amberjack commercial landings, and was used to determine if and when the commercial landings would reach the ACT. The average commercial landings were cumulative summed, and when 75% of the ACTs were met then the landings were reduced by 62.2% to reflect the impact of the landings from the trip limit being reduced down to 250 lbs gw. The cumulative summing of landings continued until the ACT was met. Table 2 provides a list of the closure dates generated from the analysis if the commercial sector retained the current fixed closed season of March 1 through May 31. The closure dates ranged from June 24 to November 21.

Table 2. The projected dates at 75% of the ACT and when the total proposed 2023 ACTs would be met for the Gulf of Mexico greater amberjack commercial sector for a range of 2023 ACTs being considered in Reef Fish Amendment 54. These projected dates assume the current fixed closed season of March 1 through May 1 was retained. The ACTs are in pounds whole weight.

ACL Buffer	75% of 2023 ACT	75% of ACT Met Date	2023 ACT	100% of ACT Met
13%	114,338	Jun-19	152,450	Oct-24
13%	64,832	Feb-13	86,443	Jun-24
13%	91,298	Feb-27	121,730	Aug-16
13%	82,346	Feb-22	109,794	Jul-27
7%	122,223	Jun-27	162,964	Nov-21
7%	69,304	Feb-15	92,405	Jul-3
7%	97,595	Jun-3	130,126	Sep-5
7%	88,025	Feb-25	117,366	Aug-8

APPENDIX I. OTHER APPLICABLE LAW

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for management of stocks included in fishery management plans (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 (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. Notice and comment, and the 30-day delay in effectiveness may be waived under specified circumstances. Proposed and final rules will be published before implementing the action 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 National Oceanic and Atmospheric Administration (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 generally 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 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, amendments, and regulations, consistent with National Standard 2 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which requires the use of best scientific 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 and 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.[40]

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

[40] http://www.boem.gov/Environmental-Stewardship/Archaeology/Shipwrecks.aspx

proposed action would have no additional adverse impacts on listed historic resources, nor would they alter any regulations intended to protect them.

Paperwork Reduction Act (PRA)

The PRA of 1995 (44 U.S.C. 3501 et seq.) regulates the collection of public information by federal agencies to ensure that the public is not overburdened with information requests, that the federal government's information collection procedures are efficient, and that federal agencies adhere to appropriate rules governing the confidentiality of such information. The PRA requires NMFS to obtain approval from OMB before requesting most types of fishery information from the public. This action would not invoke the PRA.

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. 12898: Environmental Justice

The E.O. on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations that became effective in 1994, requires federal agencies to examine the human health and socioeconomic implications of federal actions among low-income and minority groups and populations around the nation. E.O. 12898 requires that such agencies conduct programs, policies, and activities in a manner that ensures no individuals or populations are excluded, denied the benefits of, or subjected to discrimination due to race, color, or nation of origin. Of particular relevance in the context of marine fisheries, federal agencies are further required to collect, maintain, and analyze data regarding patterns of consumption of fish and wildlife among persons who rely on such foods for purposes of subsistence. In sum, the principal intent of E.O. 12898 is to require assessment and due consideration of any "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."

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 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 2005b) and Coral Amendment 9 (GMFMC 2018), 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, amendments, and regulations promulgated under the Magnuson-Stevens Act 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, HAPCs, 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.