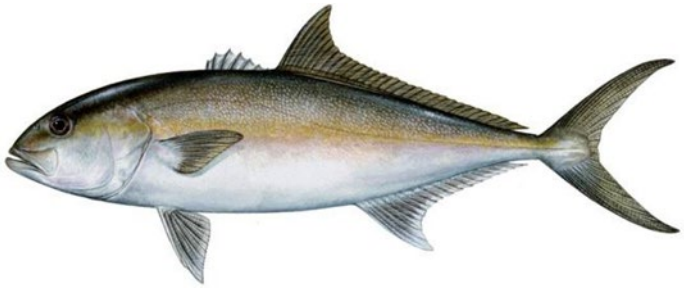
Emergency Action to Modify the Greater Amberjack Recreational Fixed Closed Season



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

Including Environmental Assessment

May 2022

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ENVIRONMENTAL ASSESSMENT COVER SHEET

Name of Action

Emergency Action to Modify the Greater Amberjack Recreational Fixed Closed Season, including Environmental Assessment

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Type of Action

( ) Administrative
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ABBREVIATIONS USED IN THIS DOCUMENT

ABC**Error! Bookmark not defined.**	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
ALS	accumulated landings system
AM	accountability measure
APAIS	Access Point Angler Intercept Survey
BiOp	biological opinion
CEA	cumulative effects analysis
CFpA	cash flow per angler
CHTS	Coastal Household Telephone Survey
Council	Gulf of Mexico Fishery Management Council
CS	consumer surplus
CSVI	Community Social Vulnerability Indicators
CVA	climate vulnerability analyses
DPS	distinct population segment
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	environmental impact statement
EJ	environmental justice
E.O.	Executive Order
ESA	Endangered Species Act
F	fishing mortality rate
FL	fork length
FES	Fishing Effort Survey
FMP	fishery management plan
FSSI	Federal Strategic Sourcing Initiative
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Florida Fish and Wildlife Research Institute
GAJ	Gulf greater amberjack
GDP	gross domestic product
Gulf	Gulf of Mexico
gw	gutted weight
HAPC	Habitat Area of Particular Concern
IFQ	individual fishing quota
IPCC	Intergovernmental Panel on Climate Change
LA Creel	Louisiana Creel
LDWF	Louisiana Department of Wildlife and Fisheries
LLE	longline endorsement
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	maximum fishing mortality threshold
mm	milimeter
MMPA	Marine Mammal Protection Act

MRIP	Marine Recreational Information Program
MRFSS	Marine Recreational Fisheries Statistics Survey
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing limit
OY	optimum yield
PAH	polycyclic aromatic hydrocarbons
PS	producer surplus
PW	product weight
RCG	Gulf Charter/Headboat Permit for Reef Fish
Reef Fish FMP	Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico
RFA	regulatory flexibility analyses
RIR	regulatory impact review
Secretary	Secretary of Commerce
SEDAR	Southeast Data, Assessment and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SF	Sustainable Fisheries
SOI	segments of interest
SPR	spawning potential ratio
SRHS	Southeast Region Headboat Survey
SSC	Scientific and Statistical Committee
SSRG	Social Science Research Group
TL	total length
TNR	trip net revenue
TPWD	Texas Parks and Wildlife Department
ww	whole weight

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CHAPTER 1. INTRODUCTION

1.1 Background

The most recent stock assessment for Gulf of Mexico (Gulf) greater amberjack, Southeast Data Assessment and Review (SEDAR) 70, was completed in 2020, and reviewed by the Gulf of Mexico Fishery Management Council's (Council) Scientific and Statistical Committee (SSC) at its January meeting in 2021. The SSC accepted the greater amberjack update assessment as the best scientific information available and agreed with the results of the assessment that greater amberjack was still overfished and undergoing overfishing. The SSC provided recommendations for reduced overfishing limit (OFL) and acceptable biological catch (ABC) so that the stock could rebuild 2027, the current target stock rebuilding time (Table 1.1.1). Greater amberjack is in the 5th year of the current 10-year rebuilding plan (GMFMC 2017a). The Council has worked toward rebuilding the greater amberjack stock since 2002. To address the results of the most recent stock assessment, the Council began development of Reef Fish Amendment 54, which would modify the Gulf greater amberjack OFLs, ABCs, sector allocation, sector annual catch limits (ACL), and sector annual catch targets (ACT). The ABC recommended by the SSC would require a 78% reduction relative to the current ABC under the current the sector allocations of 73% recreational, 27% commercial. Therefore, catch limits proposed in Amendment 54 would need to be reduced to reflect the lower ABC.

Table 1.1.1. SSC greater amberjack OFL and ABC recommendation for 2023 based on SEDAR 70 compared to the MRIP-FES equivalent of the current OFL and ABC.

Year	OFL	ABC
2020 + MRIP-FES equivalent	3,480,000	2,930,000
2023	2,236,000	649,000

Note: Catch limits in pounds whole weight (ww) and based on current sector allocation of 73% recreational, 27% commercial. The recreational portion of the 2023 OFL and ABC are based on Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES). The recreational portion of the 2020+ MRIP-FES equivalent is provided for comparison only.

The recreational sector has an ACL based on a 73% of the ABC (GMFMC 2008). The recreational sector also has an ACT, which is set 17% below the recreational ACL (GMFMC 2017a). Harvest is controlled through bag limits, size limits, inseason and postseason accountability measures (AMs) and fixed closed seasons. Due to the timing of publication of payback notices, total prior year overages based on landings presented in Table 1.1.2 and *Federal Register* noticed payback-adjusted ACLs may not match.

Until 2018, the recreational fishing season for greater amberjack in the Gulf was based on a calendar year, and the fixed closed season was June 1 - July 31 each year. Beginning in 2018, the recreational fishing year was modified to August 1 through July 31 and the fixed closed season was modified to three fixed closed seasons (January 1 – April 30, June 1 – July 31, and

November 1 – December 31). These changes were made to provide for as long of a recreational season as possible and provide fishing opportunities for multiple areas within the Gulf (GMFMC 2017a and GMFMC 2017b). When the recreational fishing year was changed to span two calendar years, the Council decided to associate the calendar year ACL and ACT determined fro the ABC, sector allocation, and ACT buffer, to the previous August start of the fishing year. For example, the 2017/2018 recreational fishing year used the 2018 recreational ACL and recreational ACT. Therefore, any change to the recreational ACL and ACT in 2023 would apply to the 2022/2023 recreational fishing year, which begins August 1, 2022.

AMs require the Regional Administrator to close the respective sector of the fishery when the ACT has been met or is projected to be met and reduce the sector ACL and sector ACT in the following year by the amount of any overage of the ACL (GMFMC 2008). Overage adjustments resulting from these AMs have occurred for the recreational and have led to dramatically shortened fishing seasons in some years (Tables 1.1.2). Since the implementation of the modified recreational fishing year and fixed closed season, paybacks have not occurred for the recreational sector. The recreational sector last had an inseason closure during the 2018/2019 fishing year (Table 1.1.2). However, it is uncertain how the COVID19 pandemic has affected fishing effort since 2020. Furthermore, if the current fixed closed seasons are retained, it is unlikely that the other management measures will slow harvest enough to avoid a significant overage of the recreational catch limits under consideration in Amendment 54 and expected to be implemented in 2023.

The need and focus of this environmental assessment is for the recreational sector. The commercial sector is not projected to meet its ACT or ACL during the timeline of this emergency rule, August 1, 2022 through July 31, 2023. Therefore, a description of the commercial sector environment is not provided here. Information regarding the commercial sector may be found in the "Modifications to Gulf of Mexico greater amberjack fishing commercial trip limits" framework action (GMFMC 2019).

Table 1.1.2. 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 1986 through 2021 in MRIP-CHTS. Units are in lbs ww.

Year	Landings MRIP-CHTS	Landings MRIP-FES	ACT	Adjusted ACT	ACL	Adjusted ACL	Percent of 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	70.0	None 76 FR 23909	304
2012	1,301,662	2,987,002	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	1,304,310	2,328,968	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	149.0	9/28/2015 80 FR 56930	209
2016	1,570,118	2,359,323	1,092,372	1,034,442	1,255,600	1,197,670	125.0	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	183
2020/ 2021	865,105	1,596,296	1,086,985	None	1,309,620	None	66.1	None	182

Source: SEFSC Recreational ACL data (Accessed January 10, 2022).
Note: An ACL, and inseason 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.
* 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 Council is currently developing Reef Fish Amendment 54 to end overfishing and continue rebuilding the greater amberjack stock. If implemented, the National Marine Fisheries Service (NMFS) expects the reductions in the catch limits adopted in Amendment 54 to be effective in the first half of 2023. Recreational harvest for the 2022/2023 fishing year begins on August 1 and if no changes are made to the current recreational closed seasons, NMFS expects recreational landings to significantly exceed the 2023 recreational ACLs the Council is considering in Amendment 54. Therefore, this action considers modifications to the recreational fixed closed seasons to reduce overfishing of the greater amberjack stock. The emergency measures would likely have adverse, socio-economic effects, but positive biological effects, beginning in 2022. However, the emergency measures would be expected to reduce the probability of paybacks and the severity of a recreational payback that would prevent the recreational season from opening in 2023/2024.

Need for an emergency rule

Emergency rules are effective for 180 days with the option to extend another 186 days. With some of the alternatives being covered under this Environmental Assessment occurring after the first 180 days and Reef Fish Amendment 54 not expected to be implemented before the first 180 days are up, NMFS anticipates that it will be necessary to have the emergency rule in effect for a total of 365 days. Therefore, the analysis in this environmental assessment assume that the applicable management measures would be in place from August 1, 2022 through July 31, 2023.

The National Oceanic and Atmospheric Administration's (NOAA) policy guidelines for the use of emergency rules (62 FR 44421, August 21, 1997) list three criteria for determining whether an emergency exists.

1. Results from recent, unforeseen events or recently discovered circumstances; and
2. Presents serious conservation or management problems in the fishery; and
3. Can be addressed through emergency regulations for which the immediate benefits outweigh the value of advance notice, public comment, and deliberative consideration of the impacts to the same extent as would be expected under the normal rulemaking process.

NMFS would promulgate these emergency regulations under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), consistent with these three criteria. For the **first emergency criterion**, the recent unforeseen event is the results of the SEDAR 70 assessment, subsequent OFL and ABC recommendations made by the Council's SSC in November 2021 and the associated sector ACLs and ACTs presented to the Council in January 2022. NMFS compared projected landings for the 2022/2023 recreational fishing year to the 2023 recreational ACT in Amendment 54 that is derived using the the current sector allocation and percentage reduction from the ACL, and determined that if the fishing season were to open on August 1, the ACT would be harvested by August 23 (Appendix A). If historic recreational fishing year landings are similar to the average from the last three years, NMFS has also projected that recreational harvest is likely to significantly exceed the 2023 recreational ACL in Amendment 54 that is based on the current sector allocation. This exceedance would is projected to be more than double the 2023 recreational ACL, resulting in

continued overfishing and requiring NMFS to close recreational harvest for all of the 2023/2024 fishing year.

The **second emergency criterion** is that the situation presents serious conservation or management problems in the fishery. The results of SEDAR 70 and the SSC's recommendations require a significant reduction in the allowable harvest of Gulf greater amberjack to prevent overfishing and rebuild the stock consistent with the current rebuilding time. If no action is taken to adjust the recreational closed seasons before the fishing year starts on August 1, 2022, NMFS projects that recreational harvest will be more than double the recreational ACL that is likely to be established through Amendment 54 and implemented in 2023. Current regulations do not allow the portion of an overage that could not be paid back in the following year to be carried over to the second year. The failure to prevent overfishing and mitigate for the entire projected overage of recreational harvest would result in negative biological effects and may prevent the stock from rebuilding by 2027. This emergency rule is expected to help NMFS constrain recreational harvest of greater amberjack to the sector's ACL, and reduce overfishing while the Council prepares Amendment 54.

Under the **third emergency criterion**, the immediate benefit of implementing the emergency rule must outweigh the value of advance notice and public comment. The 2022/2023 recreational greater amberjack fishing year opens on August 1, 2022. Delaying the implementation of the changes to the recreational fixed closed seasons to accommodate prior public notice and comment would result in the recreational greater amberjack fishing season opening on August 1 and a possible ACL overage occurring before the emergency rule would be effective. Delaying announcement would also result in less advance notice of the revised recreational greater amberjack fishing season and could be very disruptive to the fishery. Such a delay would decrease the time available for for-hire businesses to adjust their business plans and private anglers to change their fishing plans, especially if they are visiting from out-of-state.

1.2 Purpose and Need

The purpose of the emergency measures are to modify the greater amberjack recreational fixed closed season to reduce the likelihood of the sector ACL proposed in Amendment 54 from being exceeded.

The need of the emergency measures are to reduce the likelihood of overfishing, reduce the probability of an ACL overage and subsequent payback for the recreational sector, and reduce the severity of a postseason payback that could possibly prevent the recreational season from opening in the 2023/2024 fishing year while the Council develops long-term measures to end overfishing.

1.3 History of Management

The **Reef Fish Fishery Management Plan** (**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 (GMFMC 1981). 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 FMP is available on the Council's website[1].

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 F30% SPR (proxy for fishing mortality rate corresponding to an equilibrium yield of MSY [FMSY]) when the stock is at equilibrium, optimum yield as the yield associated with an F40% SPR when the stock is at equilibrium, MFMT equal to F30%SPR, and minimum stock size threshold (MSST) equal to (1-M)*BMSY (where M = natural mortality and BMSY = stock biomass level capable of producing an equilibrium yield of MSY) or 75% of BMSY. It also established 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 rebuild the stock 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

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

time that the Council, through the recommendations of an Ad Hoc Allocation Committee, could implement a separate amendment that fairly and equitably allocated Reef Fish FMP resources between recreational and commercial sectors.

A Regulatory Amendment (with EA, RIR, and RFA; GMFMC 2011c), 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 the 2010 SEDAR 9 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 in response to the SEDAR 33 stock assessment, 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 gutted weight (gw), and increased the recreational minimum size limit from 30 inches FL to 34 inches FL.

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 was in response to the 2016 SEDAR 33 Update stock assessment. It 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.

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.

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.

Amendment 54 (in progress) was started in response to the 2020 SEDAR 70 stock assessment that determined catch limits had to be severely reduced in order to meet the 2027 rebuilding timeline set with a 2017 Framework. Amendment 54 will address greater amberjack sector

allocations and catch limits to address the continued overfished and undergoing overfishing status of the stock.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 – Modify the Recreational Fixed Closed Season for Greater Amberjack

Alternative 1: No Action – Do not modify the current regulatory recreational fixed closed season. The current fixed closed season is November 1 – April 30 and June 1 - July 31 (open August 1 – October 31 and May 1 – May 31).

Alternative 2: Modify the recreational fixed closed season to be September 1 –July 31 and June 1-July 31 (open August 1-31 and May 1-May 31).

Alternative 3: Modify the recreational fixed closed season to be August 1 – August 31 and October 1 - July 31 (open September 1-30).

Alternative 4: Modify the recreational fixed closed season to be August 1 – September 30 and November 1 - July 31 (open October 1-31).

Alternative 5: Modify the recreational fixed closed season to be August 1 – August 31 and November 1 - July 31 (open September 1 – October 31).

Discussion

Alternative 1 would maintain the current regulatory recreational fixed closed season of November 1 – April 30 and June 1 - July 31 that was put in place to allow for a closure during peak spawning in the majority of the Gulf of Mexico (Gulf) and allow a spring season (GMFMC 2017b). This also allows for harvest of greater amberjack when the red snapper season is typically closed, which was also part of the purpose of changing the recreational fishing year and fixed closed season in 2018. However, recreational harvest under the **Alternative 1** for 2018/2019 – 2020/2021 fishing years averaged 1,442,478 lbs whole weight (ww) in Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES) units. Under the current sector allocation of 73% recreational and an annual catch target (ACT) 17% below the annual catch limit (ACL), the 2023 ACT in Amendment 54 would be 393,229 lbs ww in MRIP FES units and NMFS projects that recreational harvest would reach this ACT by August 23, 2022 (Table 2.1.1 and Appendix A). As mentioned previously, if the reduced recreational catch limits proposed in Amendment 54 are implemented in the first half of 2023, those catch limits would apply to the 2022/2023 recreational fishing year and are approximately 78% less than the current recreational catch limits. However, the National Marine Fisheries Service (NMFS) does not have the authority to close recreational harvest in August of 2022 because current regulations require an inseason closure based on the current, much higher, codified ACT. Historical recreational landings information project that under the current codified ACT, recreational fishing would remain open until the current codified fixed closure start date of November 1. Landings information for the fall would be obtained prior to a May reopening. However, if Reef Fish Amendment 54 is not yet implemented and the current codified ACT was not reached, the

recreational fishing season would reopen in May allowing for even greater recreational harvest (Appendix A). Retaining the fixed closed season under **Alternative 1** is projected to result in recreational harvest during the 2022/2023 fishing year that significantly exceeds 2023 annual catch limit (ACL) proposed in Amendment 54 (Table 2.1.1). This projected overage would require NMFS to implement a payback that would result in no recreational harvest for the entire 2024/2025 fishing year. This payback would not be enough to account for the entire overage but NMFS does not have the authority to carry forward the amount of the overage that cannot be paid back in the 2024/2025 fishing year. As a result, this would likely cause a further reduction in the yield stream associated with rebuilding the stock by 2027.

Table 2.1.1. The projected dates the proposed 2023 ACT being considered in Reef Fish Amendment 54 would be met for the recreational sector based on average Gulf of Mexico greater amberjack recreational landings from the 2018/2019, 2019/2020, 2020/2021 fishing years under the current sector allocation and ACT buffer (**Alternative 1**). The ACT, average fishing year landings, and projected ACL overage are in pounds ww and Marine Recreational Information Program (MRIP)-Fishing Effort Survey (FES) units.

Reef Fish Am. 54 2023 ACT	Projected Reef Fish Am. 54 2023 ACT Met Date	Average Fishing Year Landings	Projected Reef Fish Am. 54 2023 ACL overage
393,229	August 23	1,422,478	948,708

Alternative 2 would establish a fixed closed season that only allows for the month of August to be open in the fall. This would still allow for greater amberjack harvest after red snapper has historically closed for private anglers in federal waters as was a primary objective when the fixed closed season was modified in 2018 (GMFMC 2017b). It would also allow for federal for-hire operators to take those trips that have already been scheduled for the start of the fishing year. However, this alternative is not expected to not allow for a May 2023 season even if Reef Fish Amendment 54 is effective by April 30, 2023 (Table 2.1.2 and Appendix A). Landings for August are also projected to exceed the ACL alternative proposed in Reef Fish Amendment 54 derived using the current sector allocation, resulting in a payback during the 2023/2024 fishing year (Table 2.1.2). However, the overage is not projected to be so much that the 2023/2024 fishing year could not open as under **Alternative 1**. **Alternative 2** would also require for-hire operators to reschedule any trips currently booked for September or October.

Table 2.1.2. The projected dates the proposed 2023 ACT being considered in Reef Fish Amendment 54 would be met for the recreational sector based on average greater amberjack recreational landings from the 2019/2020, 2020/2021, 2021/2022 fishing years for the month of August, the current sector allocation and ACT buffer (**Alternative 2**). The ACT, average August landings, and projected ACL overage are in pounds ww and MRIP-FES units.

Reef Fish Am. 54 2023 ACT	Projected Reef Fish Am. 54 2023 ACT Met Date	Average August Landings	Projected Reef Fish Am. 54 2023 ACL overage
393,229	August 23	532,232	58,462

Alternative 3 would establish a fixed closed season that only allows for the month of September to be open in the fall. As with **Alternatives 1** and **2**, this would also allow for greater amberjack harvest after red snapper has historically closed for private anglers in federal waters. Additionally, the private angling season for red snapper has increased further into the fall since the Gulf states were delegated authority to set the private angling season under Reef Fish Amendment 50 (GMFMC 2019). Multiple states now allow fishing for red snapper federal until December. Having a season that starts on September 1 would help ensure that either greater amberjack or red snapper are still available for the private angler to harvest in the fall. Unlike **Alternatives 1** and **2,** harvest under **Alternative 3** is not projected to reach the Amendment 54 proposed 2023 ACT alternative derived using the current allocation and percentage reduction from the ACL (Table 2.1.3 and Appendix A). This would allow for a May season even if if Reef Fish Amendment 54 is effective by April 30, 2023. However, the **Alternative 3** recreational fixed closed season would require for-hire operators to reschedule any trips currently booked for August or October.

Table 2.1.3. The projected dates the proposed 2023 ACT being considered in Reef Fish Amendment 54 would be met for the recreational sector based on average greater amberjack recreational landings from the 2019/2020, 2020/2021, 2021/2022 fishing years for the month of September under the current sector allocation and ACT buffer (**Alternative 3**). The ACT and average September landings are in lbs ww and MRIP-FES units.

Reef Fish Am. 54 2023 ACT	Projected Reef Fish Am. 54 2023 ACT Met Date	Average September Landings
393,229	Not met	170,825

Alternative 4 would establish a fixed closed season that only allows for the month of October to be open in the fall. As with **Alternatives 1 - 3**, **Alternative 4** would allow for greater amberjack harvest after red snapper has historically closed for private anglers in federal waters. Like **Alternative 3, Alternative 4** would also require for-hire operators to reschedule trips that are currently booked for August. However, like **Alternative 2**, **Alternative 4** would require splitting a recreational wave for purposes of monitoring landings and would also require for-hire operators to reschedule trips that are currently booked for September. Retaining splitting a wave would maintain uncertainty in projecting landings similar to **Alternatives 1** and **2**. Like **Alternative 3,** harvest under **Alternative 4** is not projected to reach the Amendment 54 proposed 2023 ACT derived using the current sector allocation and percentage reduction from the ACL, allowing for a May season even if Reef Fish Amendment 54 is effective by April 30, 2023 (Table 2.1.4 and Appendix A). .

Table 2.1.4. The projected dates the proposed 2023 ACT being considered in Reef Fish Amendment 54 would be met for the recreational sector based on average greater amberjack recreational landings from the 2019/2020, 2020/2021, 2021/2022 fishing years for the month of October under the current sector allocation and ACT buffer (**Alternative 4**). The ACT and average October landings are in lbs ww and MRIP-FES units.

Reef Fish Am. 54 2023 ACT	Projected Reef Fish Am. 54 2023 ACT Met Date	Average October Landings
393,229	Not met	176,519

Alternative 5 would establish a fixed closed season that allows for the months of September and October to be open in the fall. As with **Alternatives 1-4**, **Alternative 5** would allow for greater amberjack harvest after red snapper has historically closed for private anglers in federal waters. Like **Alternatives 3** and **4, Alternative 5** would require for-hire operators to reschedule trips booked for August. Further, **Alternative 5** would no longer split a recreational wave for purposes of monitoring landings. This would reduce uncertainty in projecting landings as discussed in Appendix A. **Alternative 5** would also allow for the longest fishing fall season during which landings are not projected to reach the Amendment 54 proposed 2023 ACT alternative derived using the current sector allocation and percentage reduction from the ACL (Table 2.1.5 and Appendix A). However, there is a lot of uncertainty surrounding the possible shift in fishing effort if the month of August is closed. If any shift in effort occurs, **Alternative 5 is more likely than** Alternatives 3 **and** 4 to not result in a May season being able to occur even if Reef Fish Amendment 54 is effective by April 30, 2023.

Table 2.1.5. The projected dates the proposed 2023 ACT being considered in Reef Fish Amendment 54 would be met for the recreational sector based on average greater amberjack recreational landings from the 2019/2020, 2020/2021, 2021/2022 fishing years for the months of September and October under the current sector allocation and ACT buffer (**Alternative 5**). The ACT and average September and October landings are in lbs ww and MRIP-FES units.

Reef Fish Am. 54 2023 ACT	Projected Reef Fish Am. 54 2023 ACT Met Date	Average September and October Landings
393,229	Not met	347,344

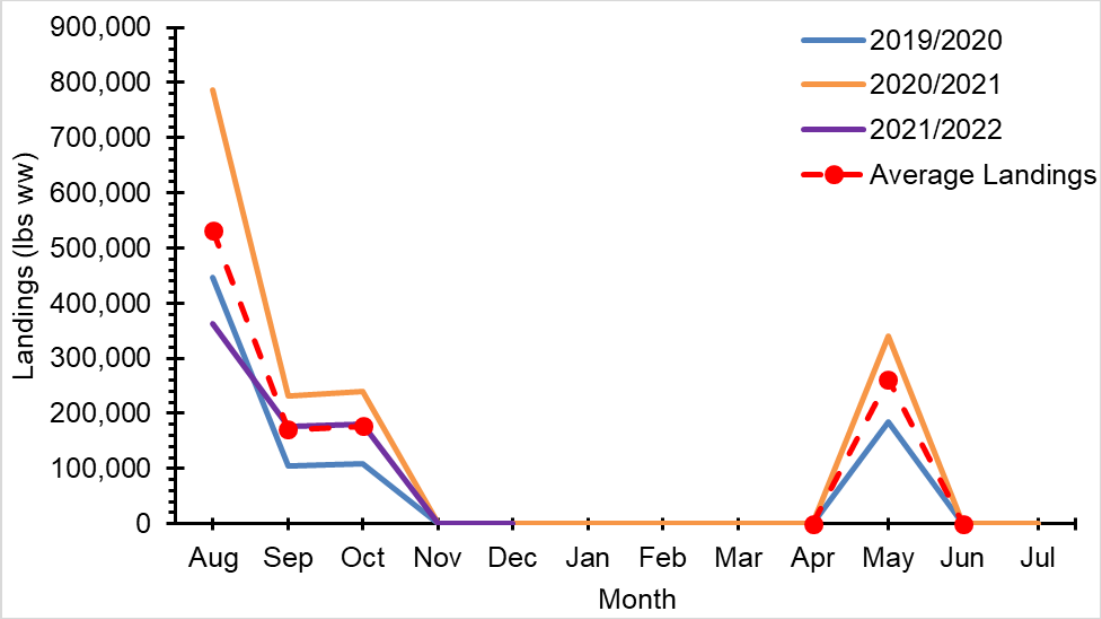

Figure 1. Gulf of Mexico greater amberjack recreational landings by month for available 2019/2020, 2020/2021, 2021/2022 fishing years, and an average of these landings. May only has landings from 2020 and 2021 because May 2022 landings are not available at this time. All landings are in lbs ww and in MRIP-FES units. The predicted recreational landings include MRIP, Southeast Region Headboat Survey (SRHS), Texas Parks and Wildlife Department (TPWD), and Louisiana (LA) Creel landings.

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 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 2005), 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 3.1.1).

Oceanographic conditions are affected by the Loop Current, discharge of freshwater into the northern Gulf, and a semi-permanent, anti-cyclonic gyre in the western Gulf. The Gulf includes both temperate and tropical waters (McEachran and 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 (NODC 2011).[2] In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

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

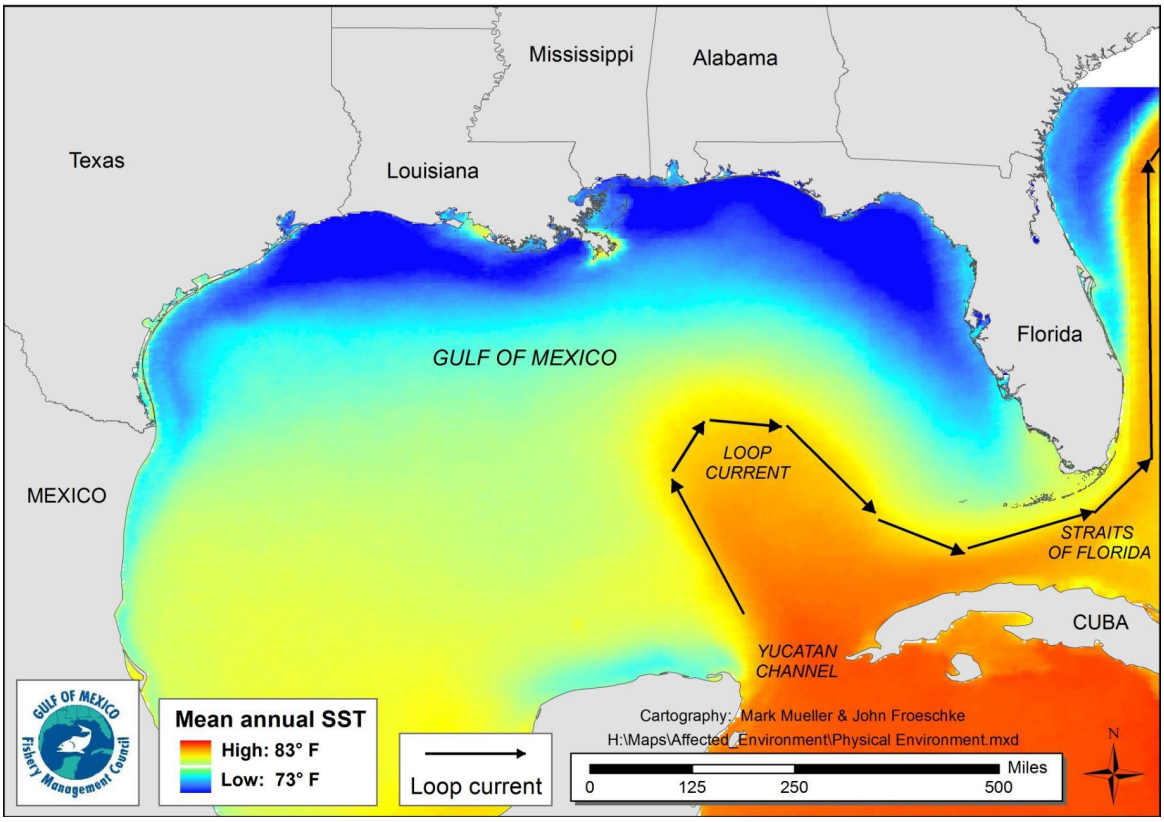

Figure 3.1.1. Mean annual sea surface temperature derived from the Advanced Very High-Resolution Radiometer Pathfinder Version 5 sea surface temperature data set.[3]

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, 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

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

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 2005) 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.[4] The hypoxic conditions in the northern Gulf directly impact less mobile benthic macroinvertebrates (e.g., polychaetes) by influencing density, species richness, and community composition (Baustian and Rabalais 2009; 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).

[4] http://gulfhypoxia.net

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 3.1.1 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 3.1.1. 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.

3.2 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 milimeter (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 (2002) 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

Details of bycatch in the greater amberjack fishery can be found in Appendix C (Bycatch Practicability Analysis) of Framework to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico (Reef Fish FMP) to modify greater amberjack allowable harvest and rebuilding plan (GMFMC 2017a), and is hereby incorporated by reference.

In summary, studies have documented low bycatch and bycatch mortality of finfish 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)[5]. 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. Bag can also play a part in bycatch, although not as significant a role as 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. Interactions with other species such as sea turtles and sea birds are known to occur, but are minimal (see next section).

This assessment considers temporary measures that are expected to affect greater amberjack discard mortality due to changing the recreational fixed closed season. 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 extending fixed closed seasons. Discard mortality increase for reef fish has been positively correlated with warmer water temperatures (Pulver 2017), of which, proposed alternatives have the recreational season being 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.

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[6]. 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.

[5] https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates
[6] https://www.fisheries.noaa.gov/about/office-protected-resources

Of the four marine mammals that may be present in the Gulf (sperm, sei, fin, and Gulf Rice's), the sperm, sei, and Gulf Rice's whale[7] 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 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.

[7] 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.

NMFS published a final rule on April 15, 2019, listing the Gulf Bryde's whale as endangered. In a memorandum dated June 20, 2019, NMFS revised the re-initiation request to include the Gulf Bryde's 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.

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 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.[8]

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).[9] 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[10] 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 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)[11] 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

[8] https://www.fisheries.noaa.gov/news/deepwater-horizon-10-years-later-10-questions
[9] http://www.ipcc.ch/
[10] https://www.esrl.noaa.gov/psd/ipcc/
[11] https://www.fisheries.noaa.gov/national/climate/climate-vulnerability-assessments

salinity. However, greater amberjack's biological traits (Figure 3.2.1) 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).

	Seriola dumerili	Attribute Mean	Data Quality	Expert Scores Plots (tallies by bin)
Sensitivity Attributes	Habitat Specificity	1.7	2.6	
	Prey Specificity	1.6	2.4	
	Adult Mobility	1.6	2.8	
	Dispersal of Early Life Stages	2.1	2.2	
	Early Life History Survival and Settlement Requirements	1.9	1.6	
	Complexity in Reproductive Strategy	2	2	
	Spawning Cycle	1.7	2.6	
	Sensitivity to Temperature	1.6	2.2	
	Sensitivity to Ocean Acidification	1.6	2	
	Population Growth Rate	1.8	2.2	
	Stock Size/Status	2.1	2.4	
	Other Stressors	1.9	1.8	
	Sensitivity Score	Low		
Exposure Factors	Air Temperature	1	0	
	Hypoxia	1.6	2.2	
	Ocean Acidification	4	2	
	Precipitation	1	0	
	Primary Productivity	1.8	2	
	Salinity	3.5	3	
	Sea Level Rise	1	0	
	Sea Surface Temperature	4	3	
	Exposure Score	High		
Overall Vulnerability Rank		Low		

Low
Moderate
High
Very High

Figure 3.2.1. Greater amberjack biological processes analyzed for climate change sensitivities.

3.3 Description of the Economic Environment

3.3.1 Commercial Sector

The focus of this environmental assessment is the recreational sector. Therefore, a description of the economic (social) environment for the commercial sector is not provided here. Information regarding the commercial sector may be found in the "Modifications to Gulf of Mexico greater amberjack fishing commercial trip limits" framework action (GMFMC, 2019).

3.3.2 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 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 3.3.2.1). 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 3.3.2.1). 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 3.3.2.2).

Table 3.3.2.1. 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)

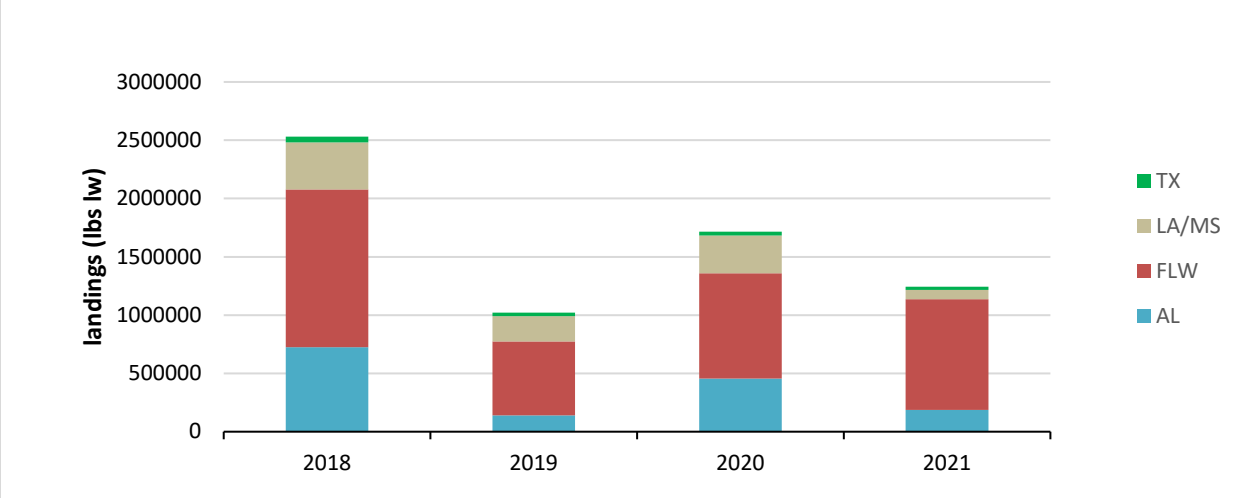

Figure 3.3.2.1. Recreational landings of Gulf greater amberjack by state.*
Source: SEFSC MRIP ACL data set (April 2022).
*Louisiana and Mississippi are combined here to align with the way headboat landings were reported.

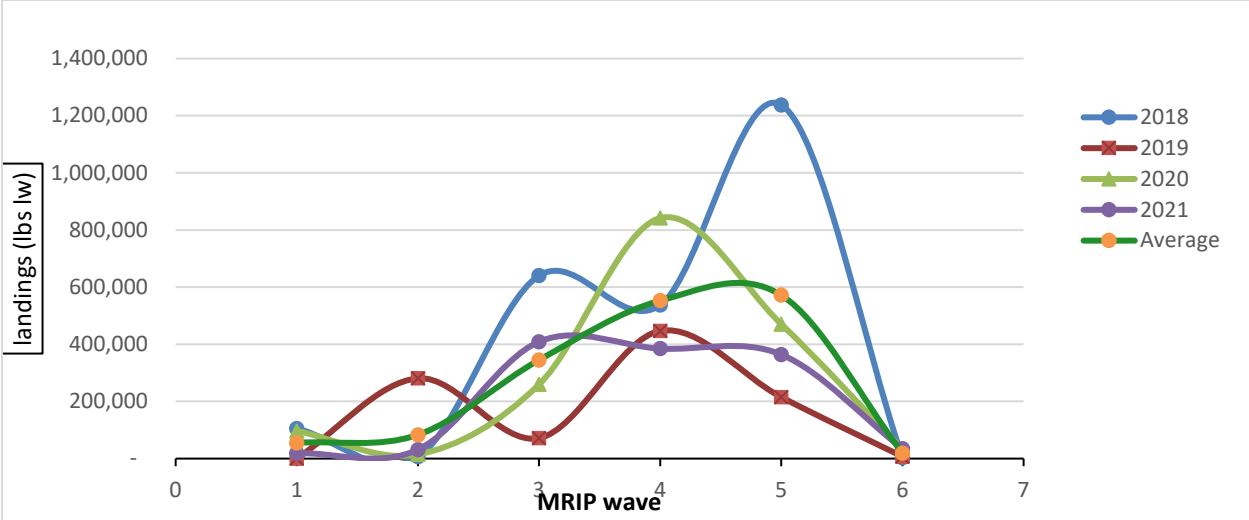

Figure 3.3.2.2. Recreational landings of Gulf greater amberjack by wave.
Source: SEFSC MRIP ACL data set (April 2022)

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).[12]

Tables 3.3.2.2 – 3.3.2.5 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 when the federal harvest season is opened for greater amberjack in the Gulf (May and August). 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.

[12] https://www.st.nmfs.noaa.gov/recreational-fisheries/data-and-documentation/queries/index

Table 3.3.2.2. Greater Amberjack recreational target trips, by mode and state, 2018-2021.

Mode	Year	Mississippi	Alabama	Florida	Louisiana	Texas	Total
Charter							
	2018	0	1,245	18,392	4,117	0	23,754
	2019	0	424	5,373	2,187	0	7,984
	2020	0	1,610	13,319	1,083	0	16,012
	2021	0	1,600	6,964	1,201	0	9,765
	Average	0	1,220	11,012	2,147	0	14,379
Private							
	2018	4,750	25,486	161,835	21,819	0	213,890
	2019	2,542	26,557	21,375	17,034	0	67,508
	2020	25,762	42,032	82,585	13,182	0	163,561
	2021	1,615	14,930	38,444	8,493	0	63,482
	Average	8,667	27,251	76,060	15,132	0	127,110
All							
	2018	4,750	26,731	180,227	25,936	0	237,644
	2019	2,542	26,981	26,748	19,221	0	75,492
	2020	25,762	43,642	95,904	14,265	0	179,573
	2021	1,615	16,530	45,408	9,694	0	73,247
	Average	8,667	28,471	87,072	17,279	0	141,489

Sources: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreationalfishing-data-downloads. Effort estimates for Texas are from the TPWD'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 LDWF Recreational Creel (LA Creel) Survey and were adjusted to MRIP-FES equivalents using the ratios in NMFS (2020). Headboat target effort is unavailable.

Table 3.3.2.3. 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	27,801	1,251	206,652
	2019	2,865	11,931	88,125	23,391	1,354	127,666
	2020	5,323	43,519	72,945	9,684	204	131,675
	2021	4,152	26,173	17,690	15,201	678	63,894
	Average	3,782	31,109	77,690	19,019	872	132,472
All							
	2018	2,788	48,023	159,832	28,944	2,394	241,981
	2019	2,865	16,562	124,758	23,858	1,821	169,864
	2020	5,323	47,690	94,700	11,681	2,201	161,595
	2021	4,152	30,209	40,514	18,270	3,747	96,892
	Average	3,782	35,621	104,951	20,688	2,541	167,583

Sources: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreationalfishing-data-downloads. Effort estimates for Texas are from the TPWD'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 LDWF Recreational Creel (LA Creel) Survey and were adjusted to MRIP FES equivalents using the ratios in NMFS (2020). Headboat target effort is unavailable.

Table 3.3.2.4. Greater Amberjack recreational target trips, by wave and mode* from 2018-2021

Mode	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	98,636	36,173	51,305	6,261	213,890
2019	4,702	0	2,881	44,577	15,348	0	67,508
2020	1,391	7,577	59,552	51,768	43,272	0	163,560
2021	0	0	28,688	26,177	8,617	0	63,482
Average	5,702	3,095	47,439	39,674	29,636	1,565	127,110
All							
2018	17,996	11,308	107,568	38,874	55,197	6,702	237,645
2019	5,467	228	2,881	46,514	20,402	0	75,492
2020	3,442	11,041	62,487	58,896	43,706	0	179,572
2021	439	0	33,707	29,548	9,554	0	73,248
Average	6,836	5,644	51,661	43,458	32,215	1,676	141,489

Sources: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreationalfishing-data-downloads. Effort estimates for Texas are from the TPWD'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 LDWF Recreational Creel (LA Creel) Survey and were adjusted to MRIP FES equivalents using the ratios in NMFS (2020). Headboat target effort is unavailable.

*No reported shore trips

Table 3.3.2.5. Greater Amberjack recreational catch trips, by wave and mode* from 2018-2021

Mode	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	8,451	7,728	77,395	80,961	61,781	11,175	247,491
2019	17,590	27,073	21,123	66,326	30,548	9,356	172,016
2020	13,420	7,462	39,834	51,865	43,643	4,583	160,807
2021	4,500	6,583	31,908	29,190	20,249	2,891	95,321
Average	10,990	12,212	42,565	57,086	39,055	7,001	168,909

Sources: MRIP Survey Data available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreationalfishing-data-downloads. Effort estimates for Texas are from the TPWD'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 LDWF Recreational Creel (LA Creel) Survey and were adjusted to MRIP FES equivalents using the ratios in NMFS (2020). 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 3.3.2.6). Texas, however, saw little decline in headboat angler days from 2018-2020, and had significant 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 3.3.2.7). 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 3.3.2.7).

Table 3.3.2.6. 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 Southeast Regional Headboat Survey (SRHS) (February, 2022).
*headboat data from Mississippi and Louisiana are combined for confidentiality purposes.

Table 3.3.2.7. 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).

For-hire 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 3.3.2.8).

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 3.3.2.8. Number of valid or renewable RCG 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. (2009) 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 (2022) used a 2014 mail survey of recreational anglers fishing in the Gulf to produce values of the CS for an additional fish kept. Carter, Lovell and Liese 2022 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 us our closest 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 (pers. comm. 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 3.3.2.8, 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 3.3.2.9. 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 gross domestic product (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 3.3.2.10. To calculate the multipliers from Table 3.3.2.10, 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 3.3.2.10 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 3.3.2.10 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 3.3.2.10. 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	TX*
	Charter Mode				
Target Trips	11,012	1,220	0	2,147	0
Value Added Impacts	$3,853	$508	$0	$1,018	$0
Sales Impacts	$6,470	$924	$0	$1,913	$0
Income Impacts	$2,251	$290	$0	$600	$0
Employment (Jobs)	60	10	0	22	0
	Private/Rental Mode				
Target Trips	76,060	27,251	8,667	15,312	0
Value Added Impacts	$2,742	$1,232	$189	$2,285	$0
Sales Impacts	$4,250	$1,906	$314	$3,911	$0
Income Impacts	$1,439	$479	$100	$1,234	$0
Employment (Jobs)	39	18	3	31	0
	All Modes				
Target Trips	87,072	28,471	8,667	17,459	0
Value Added Impacts	$6,595	$1,740	$189	$3,303	$0
Sales Impacts	$10,720	$2,830	$314	$5,824	$0
Income Impacts	$3,690	$769	$100	$1,835	$0
Employment (Jobs)	98	28	3	53	0

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 currently no shore multipliers available for Texas
Note: Headboat information is unavailable.

3.4 Description of the Social Environment

The emergency action addressed in this document may affect existing strategies for management of greater amberjack resources in the Gulf of Mexico, with potential implications for persons who pursue the species for recreational purposes. The focus of this environmental assessment is the recreational sector. Therefore, a description of the social environment for the commercial sector is not provided here. Information regarding the commercial sector may be found in the "Modifications to Gulf of Mexico greater amberjack fishing commercial trip limits" framework action (GMFMC, 2019). The present section describes select social, demographic, and geographic aspects of the greater amberjack recreational sector addressed by the emergency rule, providing essential background for social effects analysis in Chapter 4. Quantitative description is limited to the 2016 through 2020 time-series, with emphasis on data year 2020. Description of community-level involvement in the fishery sector of interest is provided to meet the requirements of National Standard 8 of the Magnuson-Stevens Fishery Conservation and

Management Act (Magnuson-Stevens 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.

3.4.1 Greater Amberjack Recreational 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 2004). This affinity has implications for the location, depth, and manner in which captains and crew pursue the species.

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. The behaviors of greater amberjack, ecological indications of 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 of Mexico. 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

Data available from the SEFSC Recreational ACL database indicate that over 641,000 greater amberjack were landed on a recreational basis in the Gulf region during fishing year 2019/2020. Based on analysis of time-series data regarding the distribution of recreational greater amberjack

landings in the Gulf region (GMFMC 2017a), 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. 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 of Mexico 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 Choctwatchee Bay and the Gulf of Mexico in northwest Florida, Destin fleets are also directly adjacent to Gulf waters, in this case via East Pass. Both communities are popular Gulf of Mexico tourist destinations.

Table 3.4.2.1. Distribution of Gulf of Mexico for-hire/headboat reef fish permits among the top permit-holding communities in the regionn 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 of Mexico 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 3.4.2.1 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.

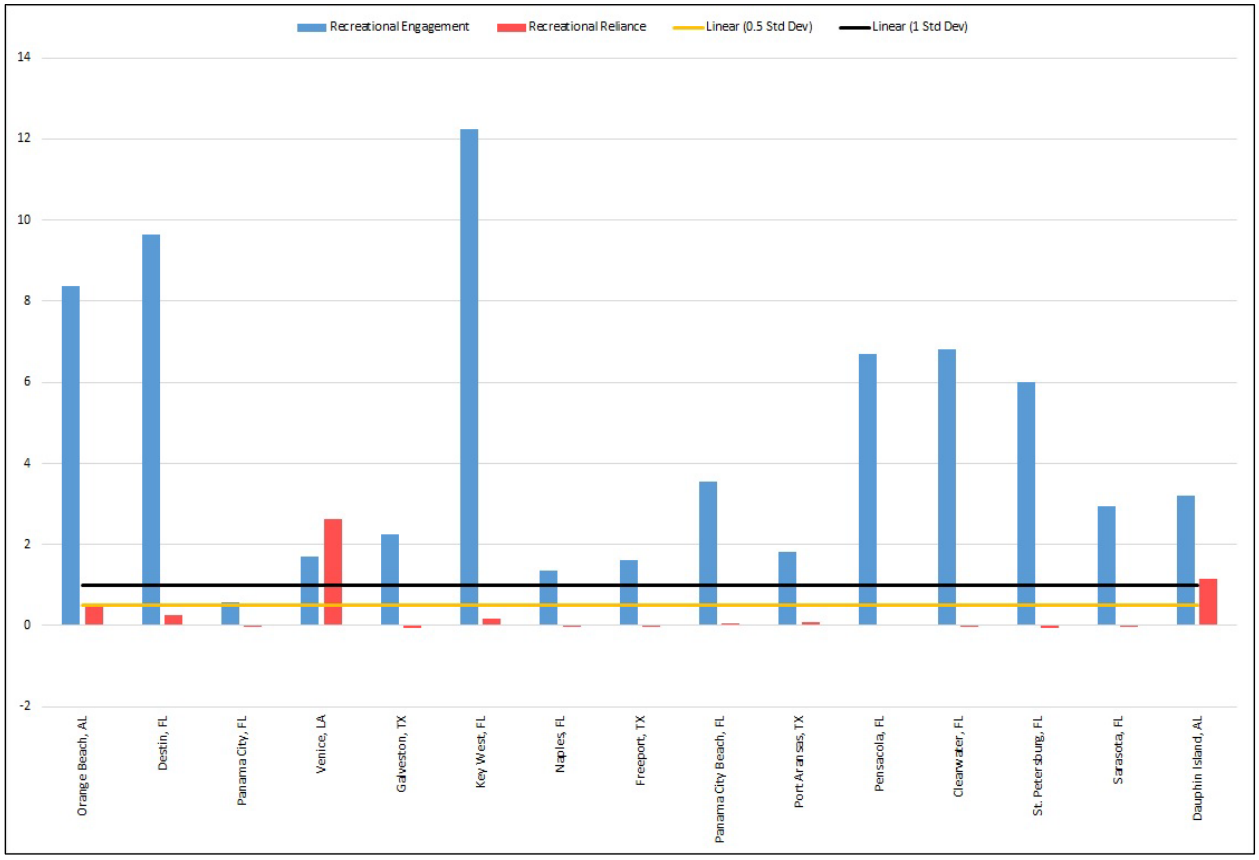

Figure 3.4.2.1. Measures of community involvement in the Gulf of Mexico recreational fishing industry during 2020.
Source: SERO, Community Social Vulnerability Indicators (CSVI) Database.

3.4.2 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 figure, 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 recreational fisheries of which the greater amberjack recreational fishery is an important element. 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.

Figure 3.4.3.1 below depicts social vulnerability measures for communities most extensively involved in the Gulf recreational fishing industry. The data presented here indicate social vulnerabilities in multiple communities, and especially in the Florida communities of Venice, Louisiana, and Freeport, Texas. The figure derives from data available in the SERO Community Social Vulnerability Indicators (CSVI) Database.

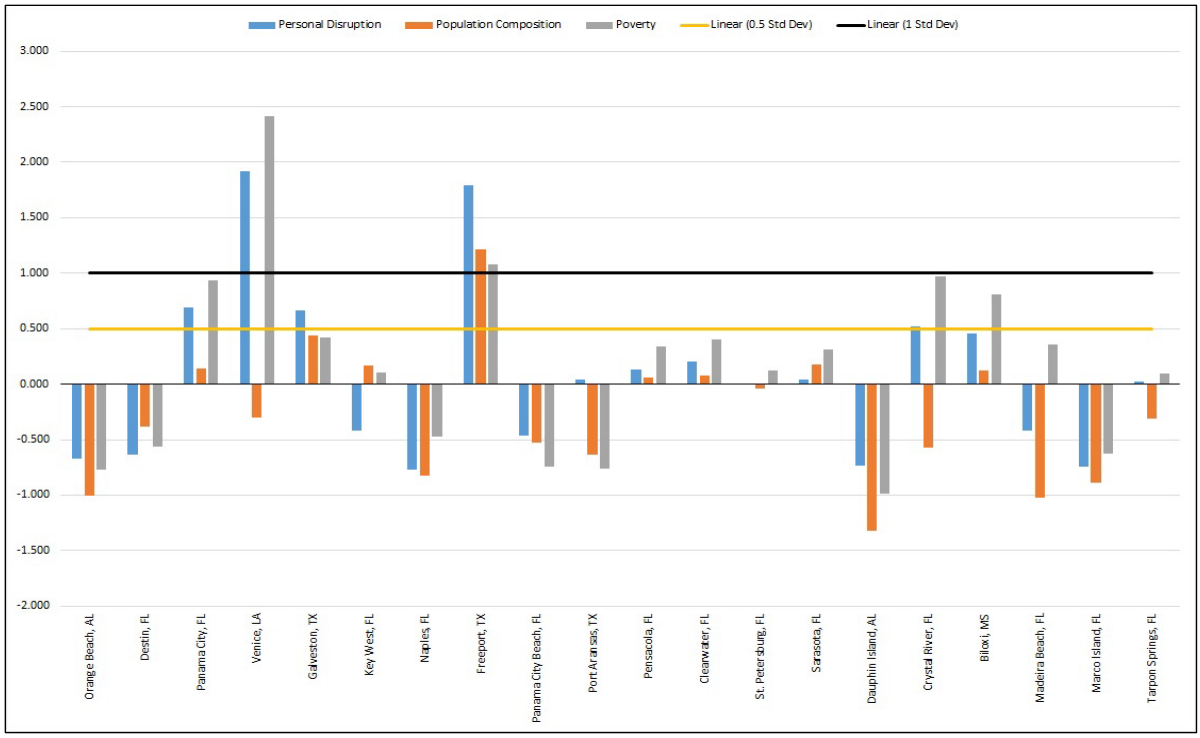

Figure 3.4.3.1. Social vulnerability measures for Gulf of Mexico communities with the greatest number of locally held for-hire reef fish permits.
Source: SERO CSVI Database.

3.5 Description of the Administrative Environment

3.5.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Act (16 U.S.C. 1801 *et seq*.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the 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.

3.5.2 State Fishery Management

The purpose of state representation at the Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective state fisheries. Each of the five 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 3.6.1.1).

Table 3.5.2.1. 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. LIST OF PREPARERS AND REVIEWERS

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REVIEWERS

Name	Expertise	Responsibility	Agency
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Nancie Cummings	Research Fishery Biologist	Review	SEFSC
David Carter	Economist	Review	SEFSC
Jennifer Lee	Protected Resources	Review	SERO
David Dale	Essential Fish Habitat	Review	SERO
Peter Hood	Branch Chief	Review	SERO
Carrie Simmons, Ph.D.	Executive Director	Review	GMFMC
John Froeschke, Ph.D.	Deputy Director	Review	GMFMC

GMFMC = Gulf of Mexico Fishery Management Council; NOAA GC = National Oceanic and Atmospheric Administration General Counsel; SAFMC = South Atlantic Fishery Management Council; SEFSC = Southeast Fisheries Science Center of the National Marine Fisheries Service; SERO = Southeast Regional Office of the National Marine Fisheries Service

CHAPTER 5. LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED

Gulf of Mexico Fishery Management Council
National Marine Fisheries Service
- Southeast Fisheries Science Center
- Southeast Regional Office
    - Protected Resources
    - Habitat Conservation
    - Sustainable Fisheries

NOAA General Counsel
U.S. Coast Guard

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APPENDIX A. 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. The Emergency Rule is looking to change the fixed closed season to be September 1st through July 31st (open August 1st through August 31st), August 1st through August 31st and October 1st through July 31st (open September 1st through September 30th), or August 1st through September 30th and November 1st through July 31st (open October 1st through October 31st) in order to reduce harvest so as not to exceed the 2023 proposed ACT alternatives in Reef Fish Amendment 54.

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). This data was 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 Emergency Rule currently being drafted will be imposed on future fishing years. However, 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 this data was 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

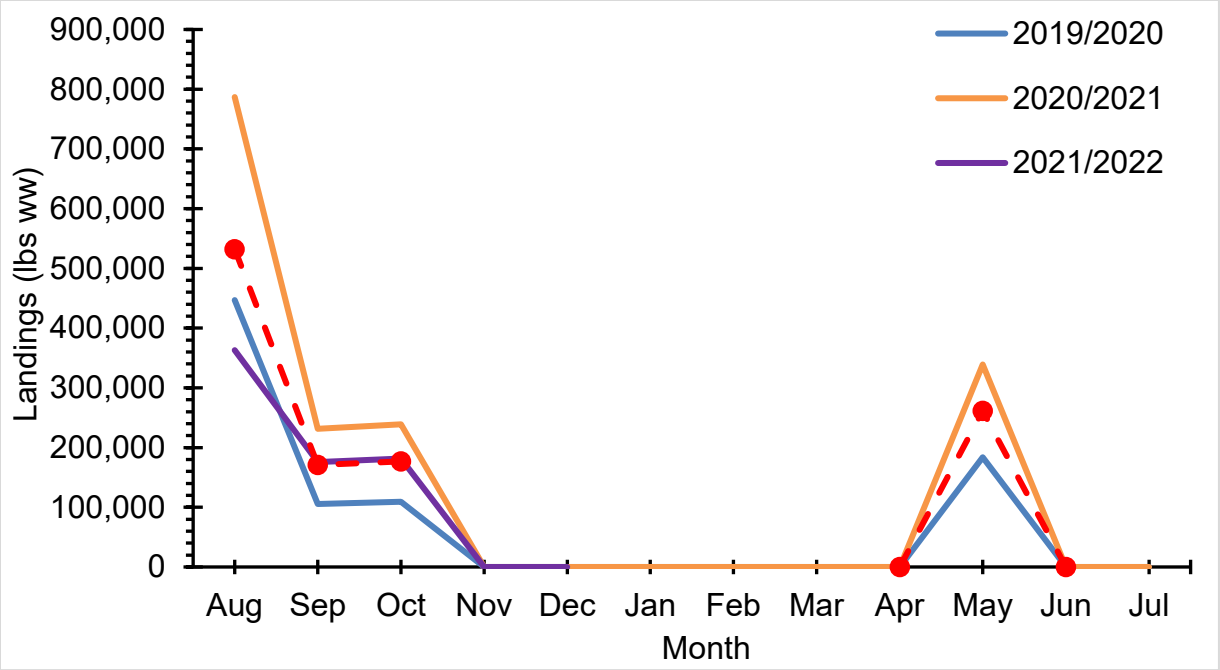

Figure 1. Gulf of Mexico greater amberjack recreational landings by month for available 2019/2020, 2020/2021, 2021/2022 fishing years, and also an average of these landings. May only has landings from 2020 and 2021 because the recreational sector was closed in 2019 and May 2022 landings are not available 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

Other options for estimating if the proposed 2023 Reef Fish Amendment 54 ACTs would be met is to open the recreational sector on September 1st or October 1st and keep it open only for each of those months. Table 3 provides the predicted dates the proposed ACT would be met with the fishing season only being open the month of September. Table 4 provides the predicted dates the proposed ACT would be met with the fishing season only being open the month of October.

Table 3. 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 September. The ACTs are in pounds whole weight.

ACL Buffer	2023 ACT	ACT Met Date
17%	393,229	Not met
17%	432,961	Not met
17%	411,746	Not met
17%	418,984	Not met
13%	412,180	Not met

Table 4. 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 the Reef Fish Amendment 54. The ACT met dates assume the recreational sector open only the month of October. The ACTs are in pounds whole weight.

ACL Buffer	2023 ACT	ACT Met Date
17%	393,229	Not met
17%	432,961	Not met
17%	411,746	Not met
17%	418,984	Not met
13%	412,180	Not met

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 B. OTHER APPLICABLE LAWS

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

Coastal Zone Management Act

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

Regulations at 15 CFR 930.32(b) state: "A federal agency may deviate from full consistency with an approved management program when such deviation is justified because of an emergency or other similar unforeseen circumstance ("exigent circumstance"), which presents the federal agency with a substantial obstacle that prevents complete adherence to the approved program." The dynamic circumstances supporting the request for the emergency rule, and the associated need to implement this emergency rule qualify as exigent circumstances.

Upon submission to the Secretary of Commerce, NMFS will determine if this plan amendment is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. Their determination will

then be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these states.

Data Quality Act

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

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

Scientific information and data are key components of FMPs, 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. Further information can be found at: http://www.boem.gov/Environmental-Stewardship/Archaeology/Shipwrecks.aspx

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

Executive Orders (E.O.)

E.O. 12630: Takings

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

E.O. 13089: Coral Reef Protection

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

Regulations are already in place to limit or reduce habitat impacts within the Flower Garden Banks National Marine Sanctuary. Additionally, NMFS approved and implemented Generic Amendment 3 for Essential Fish Habitat (GMFMC 2005) 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