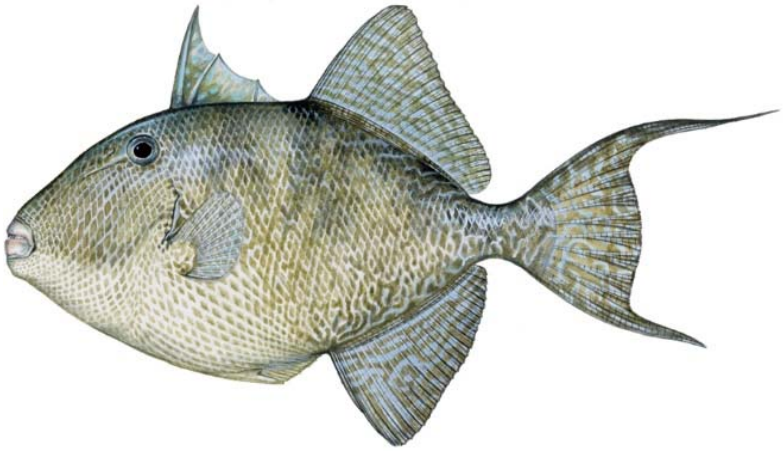
# Modifications to Gray Triggerfish Catch Levels



## Framework Action
## to the Fishery Management Plan for
## Reef Fish Resources of the Gulf of Mexico
## Including Environmental Assessment

## January 2021

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# ENVIRONMENTAL ASSESSMENT COVER SHEET

**Name of Action**

Framework Action to the Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico: Modification to Gray Triggerfish Catch Levels including Environmental Assessment.

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**Type of Action**

( ) Administrative
(X) Draft

( ) Legislative
( ) Final

Updates to the Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA) (40 CFR parts 1500 through 1508) became effective on September 14, 2020 [85 FR 43304]. This draft Environmental Assessment was prepared using the updated definition of *effects* or *impacts* in 50 CFR § 1508.1(g). Any effect or impact evaluated in this draft EA has been determined to meet the two-part standard for "reasonable foreseeability" and "reasonably close causal connection" required by the new definition.

# ABBREVIATIONS USED IN THIS DOCUMENT

| | |
|---|---|
| ABC | acceptable biological catch |
| ACL | annual catch limit |
| ACT | annual catch target |
| ALS | Accumulated Landings System |
| AM | accountability measures |
| AP | Advisory Panel |
| APAIS | Access Point Angler Intercept Survey |
| BEA | U.S. Bureau of Economic Analysis |
| CFpA | cash flow per angler |
| CHTS | Coastal Household Telephone Survey |
| Council | Gulf of Mexico Fishery Management Council |
| CS | consumer surplus |
| EA | environmental assessment |
| EEZ | Exclusive Economic Zone |
| EFH | essential fish habitat |
| EIS | environmental impact statement |
| E.O. | Executive Order |
| EJ | Environmental Justice |
| ESA | Endangered Species Act |
| F | fishing mortality |
| FES | Fishing Effort Survey |
| FL | fork length |
| FMP | fishery management plan |
| GDP | gross domestic product |
| Gulf | Gulf of Mexico Fishery |
| gw | gutted weight |
| HAPC | Habitat Areas of Particular Concern |
| IPCC | Intergovernmental Panel on Climate Change |
| MFMT | maximum fishing mortality threshold |
| MMPA | Marine Mammal Protection Act |
| mp | million pounds |
| MRFSS | Marine Recreational Fisheries Statistics Survey |
| MRIP | Marine Recreational Information Program |
| MSST | minimum stock size threshold |
| MSY | maximum sustainable yield |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| Opinion | Biological Opinion |
| OFL | overfishing limit |
| OY | optimum yield |
| PAH | polycyclic aromatic hydrocarbons |
| pw | product weight |
| Reef Fish FMP | Fishery Management Plan for the Reef Fish Resources of the Gulf |

| | |
|---|---|
| | of Mexico |
| RFA | Regulatory Flexibility Analysis |
| RIR | Regulatory Impact Review |
| SDC | status determination criteria |
| SEAMAP | Southeast Area Monitoring and Assessment Program |
| SEDAR | Southeast Data Assessment and Review |
| SEFSC | Southeast Fishery Science Center |
| SFA | Sustainable Fisheries Act |
| SPR | spawning potential ratio |
| SRHS | Southeast Region Headboat Survey |
| SSB | spawning stock biomass |
| SSC | Scientific and Statistical Committee |
| SSRG | Social Science Research Group |
| TL | total length |
| TNR | trip net revenue |
| ww | whole weight |

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# CHAPTER 1. INTRODUCTION

## 1.1 Background

Gray triggerfish are managed under the Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf of Mexico (Reef Fish FMP). This framework action would modify the acceptable biological catch (ABC), annual catch limits (ACL) and annual catch targets (ACT) for the gray triggerfish stock consistent with recommendations from the Gulf of Mexico (Gulf) Fishery Management Council's (Council) Scientific and Statistical Committee (SSC).

In September 2020, the Council's SSC reviewed an interim analysis for gray triggerfish (NOAA 2020). The proposed modifications to the gray triggerfish ABC, ACLs, and ACTs are based on results of that interim analysis and subsequent recommendations from the Council's SSC. The SSC determined the interim analysis suitable for providing interim catch advice through 2023. The gray triggerfish stock is rebuilding but is not considered overfished (GMFMC 2017a and 2017b), and is not experiencing overfishing. Gulf gray triggerfish was considered overfished in SEDAR 43 (2015), which was finalized in 2015, using data through 2013 based on the minimum stock size threshold (MSST) defined as $(1-M)*B_{30\% \text{ SPR}}$. Reef Fish Amendment 44 to the Reef Fish FMP changed the MSST for gray triggerfish to $0.50*B_{\text{MSY (or proxy)}}$, which resulted in a change in the stock status to not overfished but rebuilding. Amendment 46 to the Reef Fish FMP implemented a rebuilding plan based on the SSC's review of SEDAR 43,[1] and specified management measures in response to the results of that stock assessment.

*Establishment of gray triggerfish catch limits*

The ACLs and ACTs for gray triggerfish were established in Amendment 30A (GMFMC 2008) to the Reef Fish FMP. After the completion of the 2011 SEDAR 9 Update Assessment (SEDAR 9 Update 2011), the National Marine Fisheries Service (NMFS) published an interim rule (77 FR 28308; May 14, 2012) that reduced the recreational and commercial ACLs and ACTs to end overfishing while Amendment 37 to the Reef Fish FMP (GMFMC 2012) was being developed. Amendment 37 established a plan to rebuild the stock in 5 years and replaced the ACLs specified by the 2012 interim rule reducing the ACLs and ACTs. The SEDAR 43 (2015) stock assessment indicated the gray triggerfish stock was not rebuilt. Amendment 46 to the Reef Fish FMP (GMFMC 2017b) retained the ABC and sector ACLs and ACTs set with Amendment 37, but established a new rebuilding timeline of nine years (or 2025), according to the results of the SEDAR 43 stock assessment and subsequent SSC review. Although the Council decided not to modify the ABC, ACLs, and ACTs based on rebuilding timelines of 8, 9, and 10 years from the SEDAR 43 stock assessment. Amendment 46 implicitly adopted the SSC's recommendations for overfishing limits (OFL) of 1.31, 1.29, and 1.22 million pounds (mp) whole weight (ww) for years 2017, 2018, 2019, and beyond, respectively, by including alternatives with an ABC that was higher than the status quo OFL.

[1] https://sedarweb.org/docs/supp/Gulf%20SSC%20Review%20Summary%20-%20SEDAR%2043%20-%20Gulf%20Gray%20Triggerfish.pdf

*Gray triggerfish management and landings*

The fishing year for gray triggerfish is January 1 – December 31 with a fixed seasonal closure for the recreational sector from January 1 to the end of February, and June 1 – July 31; a seasonal closure for the commercial sector is in place from June 1 – July 31. The stock ACL is allocated 79% to the recreational sector and 21% to the commercial sector. The minimum size limits for gray triggerfish are a 15-inch fork length (FL) for the recreational sector, and 14-inch FL for the commercial sector. The recreational bag limit is one fish per person per day within the 20-reef fish aggregate bag limit for vermilion snapper, lane snapper, gray triggerfish, almaco jack, and tilefishes (golden, blueline, and goldface). The commercial trip limit is 16 fish per vessel. Currently, the commercial and recreational sectors have ACTs set at 5% and 10% below their respective ACLs. When either sector's landings reach or are projected to reach the ACT, that sector is closed to harvest for the remainder of its fishing year. If the commercial sector's landings exceed its ACL, then in the following fishing year, a post-season accountability measure (AM) overage adjustment is applied that reduces the commercial ACL by the amount of the overage and adjusts the commercial ACT accordingly. If the recreational sector's landings exceed its ACL and the gray triggerfish stock is overfished, then in the following year, a post-season overage adjustment is applied that reduces the recreational ACL by the amount of the overage and adjusts the recreational ACT accordingly.

Since ACLs were implemented in 2011, both fishing sectors have experienced periodic overages and payback AMs with annual seasonal closures to protect the stock from overexploitation (Table 1.1.1 and 1.1.2). The recreational sector ACL has been exceeded in several years since 2011; however, a payback provision AM was only applied in fishing years when the stock was determined to be overfished. The commercial sector exceeded its ACL in 2012 and 2018, with the payback provision AM being applied in the year following the overages (2013 and 2019, respectively). Further, due to the timing of when payback notices were published, total prior year overages based on landings presented in Table 1.1.1 and 1.1.2 and *Federal Register* noticed payback-adjusted ACLs may not match. Historical recreational harvest data are presented in Marine Recreational Fisheries Statistics Survey (MRFSS) and Marine Recreational Information Program's (MRIP) Coastal Household Telephone Survey (CHTS) data currencies. NMFS transitioned from monitoring the catch limit in MRFSS for the applicable years to MRIP-CHTS in 2018. A more detailed description on the recent changes to recreational catch and effort data can be found in Appendix B. Gray triggerfish recreational landings are currently recorded in MRIP-FES, however, they are back-calibrated to MRIP-CHTS to be directly comparable to the catch limits which will remain in MRIP-CHTS for quota monitoring purposes. Updating the catch limits to MRIP-FES data currency will require a stock assessment.

**Table 1.1.1** Gray triggerfish recreational landings, data collection units, recreational ACL, payback-adjusted ACL, percent ACL landed, and closure dates for the years 2008 through 2019. Landings are in pounds whole weight.

| Year | Landings | Data Units | ACT | Adjusted ACT | ACL | Adjusted ACL | Percent of ACL Landed | Closure Date |
|---|---|---|---|---|---|---|---|---|
| **2008** | 408,434 | MRFSS | 306,000 | None | 394,000 | None | 103.7 | None |
| **2009** | 402,539 | MRFSS | 356,000 | None | 426,000 | None | 94.5 | None |
| **2010** | 299,177 | MRFSS | 405,000 | None | 457,000 | None | 65.5 | None |
| **2011** | 477,477 | MRFSS | 405,000 | None | 457,000 | None | 104.5 | None |
| **2012** | 269,877 | MRFSS | 217,000 | None | 241,200 | None | 111.9 | 6/11/2012 |
| **2013** | 518,932 | MRFSS | 217,000 | None | 241,200 | None | 215.1 | 10/15/2013 |
| **2014** | 231,818 | MRFSS | 217,100 | 1,658 | 241,200 | 25,758 | 96.1 | 5/1/2014 |
| **2015** | 67,245 | MRFSS | 217,100 | 30,107 | 241,200 | 54,207 | 27.9 | 2/7/2015 |
| **2016** | 438,149 | MRFSS | 217,100 | 177,123 | 241,200 | 201,223 | 181.7 | 6/1/2016 |
| **2017** | 62,238 | MRFSS | 217,100 | 0 | 241,200 | 19,987 | 25.8 | 1/1/2017 |
| **2018** | 491,514 | MRIP-CHTS | 217,100 | None | 241,200 | None | 203.8 | 8/17/2018 |
| **2019** | 310,816 | MRIP-CHTS | 217,100 | None | 241,200 | None | 128.9 | 5/11/2019 |

Source SEFSC MRFSS recreational ACL data retrieved on May 19, 2020, and SEFSC MRIP-CHTS recreational ACL data retrieved on Sept. 14, 2020.

**Table 1.1.2.** Gray triggerfish commercial landings, commercial ACL, payback-adjusted ACL, percent ACL landed, and closure dates for 2008-2019. Landing units are in pounds whole weight.

| Year | Landings | ACT | Adjusted ACT | ACL | Adjusted ACL | Percent of ACL Landed | Closure Date |
|---|---|---|---|---|---|---|---|
| **2008** | 76,717 | 80,000 | None | 105,000 | None | 73.1 | None |
| **2009** | 78,117 | 93,000 | None | 122,000 | None | 64.0 | None |
| **2010** | 55,661 | 106,000 | None | 138,000 | None | 40.3 | None |
| **2011** | 105,251 | 106,000 | None | 138,000 | None | 76.3 | None |
| **2012** | 72,778 | 60,900 | None | 64,100 | None | 113.5 | 7/1/2012 |
| **2013** | 63,086 | 60,900 | 51,602 | 64,100 | 54,802 | 98.4 | None |
| **2014** | 40,908 | 60,900 | None | 64,100 | None | 63.8 | None |
| **2015** | 48,012 | 60,900 | None | 64,100 | None | 74.9 | None |
| **2016** | 59,787 | 60,900 | None | 64,100 | None | 93.3 | None |
| **2017** | 63,264 | 60,900 | None | 64,100 | None | 98.7 | 11/17/2017 |
| **2018** | 65,373 | 60,900 | None | 64,100 | None | 102.0 | 10/7/2018 |
| **2019** | 62,810 | 60,900 | 60,298 | 64,100 | 63,498 | 98.9 | 11/26/2019 |

Source: SEFSC Commercial ACL data retrieved August 21, 2020.

*Recent gray triggerfish catch advice*

The SEDAR 62 (2019) stock assessment was intended to update catch advice using data through 2017; however, the assessment was withdrawn due to inaccuracies in essential data inputs that could not be easily reconciled; these will be addressed in a future research track assessment. Therefore, SEDAR 43 is the last stock assessment to be accepted as the best available science by the SSC with a terminal data year of 2013. While the previously established ABC of 305,300 lbs ww was maintained after SEDAR 62 was withdrawn, an interim analysis (NOAA 2020) provided updated ABC advice for SSC consideration. Despite some reservations by the SSC regarding the robustness of an interim analysis approach and its assumption of a strong proportionality between the chosen index (Southeast Area Monitoring and Assessment Program (SEAMAP) combined video survey) and the ABC, the SSC determined that the interim analysis was a useful tool for providing interim catch advice. The SSC recommended an increase in the ABC to 456,900 lbs ww (in the MRIP-CHTS data currency) for 2021 – 2023 and that an updated interim analysis be completed and used as the basis for catch advice for 2024 forward if a new stock assessment has not yet been completed. Gray triggerfish catch advice will continue to be provided in MRIP-CHTS data currency until the next stock assessment is completed. Previous ABC recommendations are still based on projections from the 2011 SEDAR 9 Update assessment. The gray triggerfish stock is still in a rebuilding plan; however, it is impossible to accurately gauge progress toward rebuilding as the interim analysis approach does not provide a biomass estimate. However, index of abundance trends suggest that it is likely that gray triggerfish biomass has increased in recent years. This additional biomass should support additional removals, but it will take a full stock assessment to determine if the stock is rebuilding according to the plan specified in Amendment 46.

Unlike typical stock assessments, interim analyses are designed to occur between regular SEDAR assessments to provide a quantitative method of adjusting catch advice, if needed, and infer stock status based on current stock conditions. Interim analyses use a representative fishery-independent index of abundance to make recommendations about changes in allowable harvest based on the trend in stock size relative to a pre-determined reference period. The gray triggerfish interim analysis used SEAMAP's combined video index as its representative index of abundance. This combined video index uses video data collected by the NMFS Pascagoula Laboratory, the NMFS Panama City Laboratory, and the Florida Fish and Wildlife Research Institute, and was used to estimate the current trend in abundance for the stock. This index was developed as part of Gulf SEDAR assessments (Pollack et al. 2015) to estimate relative abundance.

## 1.2 Purpose and Need

The purpose of the proposed action is to increase the ABC, ACLs, and ACTs, consistent with the gray triggerfish interim analysis, and SEFSC, SSC, and Reef Fish Advisory Panel recommendations.

The need for the proposed action is to establish catch limits that achieve optimum yield (OY) consistent with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act, while preventing overfishing.

## 1.3 History of Management

This history of management covers events pertinent to the management of gray triggerfish in the Gulf. A complete history of management for the Reef Fish FMP is available on the Council's website[2]. The original Reef Fish FMP [with its associated Environmental Impact Statement (EIS)] (GMFMC 1981) was implemented November 8, 1984. The following describes actions specific to gray triggerfish.

**Amendment 1** [with its associated environmental assessment (EA), regulatory impact review (RIR), and regulatory flexibility analysis (RFA)], implemented in 1990, added gray triggerfish to the fishery management unit and provided a framework procedure for specifying the total allowable catch. The framework procedure specified that allocations between the commercial and recreational sectors were based on historical landing percentages from average landings during 1979-1987.

**Amendment 12** (with its associated EA and RIR), implemented in January 1997, created an aggregate bag limit of 20-reef fish for all reef fish species not having a bag limit, including gray triggerfish.

**Amendment 16B** (with its associated EA and RIR), implemented in 1999, established a gray triggerfish 12-inch total length (TL) minimum size limit.

[2] http://gulfcouncil.org/fishery-management/implemented-plans/reef-fish/

**Amendment 30A** (with its supplemental EIS, RIR and RFA), implemented in 2008, was developed in part to stop overfishing of gray triggerfish and rebuild the overfished stock. The amendment established the maximum sustainable yield (MSY), MSST, and OY status determination criteria (SDC), and set ACLs, ACTs and AMs, set sector allocations of 21% commercial and 79% recreational, and increased the gray triggerfish minimum size limit to 14-inches FL. The size limit was changed from TL to FL to assist fishermen in measuring gray triggerfish.

The **2012 interim rule** reduced the recreational and commercial ACLs and ACTs, respectively, after the results of the 2011 Update Assessment (SEDAR 9 Update 2011) until Amendment 37 could be finalized.

**Amendment 37** (with its associated EA, RIR, and RFA), implemented in June 2013, made the reductions in ACLs and ACTs for both sectors permanent and established the objective of rebuilding the stock within 5 years or less. The rebuilding plan also modified the recreational AMs to replace the existing AM with an in-season closure authority based on the recreational ACT. A post-season overage adjustment was also added to the recreational AMs. Any overages for the recreational ACL are applied only if the stock is overfished, and the ACL and ACT are reduced by the amount of the overage in the following season. Amendment 37 also established a fixed closed season for gray triggerfish during peak spawning (June 1 through July 31) for both the recreational and commercial sectors. The daily recreational bag limit was reduced to 2 gray triggerfish per angler within the 20-reef fish aggregate bag limit and a commercial trip limit of 12 fish was implemented.

**Amendment 44** (with its associated EA), implemented in 2017, re-defined MSST for seven reef fish species including gray triggerfish. MSST was re-defined to be 50% of the BMSY proxy.

**Amendment 46** (with its associated EA, RIR, and RFA), implemented in 2018, established a rebuilding time period of 9 years, or the end of 2025, modified the recreational seasonal closure to be January 1 through the end of February, and June 1 through July 31, reduced the recreational bag limit to 1 gray triggerfish per angler per day within the 20-reef fish aggregate bag limit, increased the recreational minimum size limit for gray triggerfish to 15-inches FL and increased the commercial trip limit for gray triggerfish to 16 fish per trip.

# CHAPTER 2. MANAGEMENT ALTERNATIVES

## 2.1 Action 1 – Modify the Gray Triggerfish ABC, ACLs, and ACTs

**Alternative 1:** No Action. Retain the acceptable biological catch (ABC), annual catch limits (ACL), and annual catch targets (ACT) for gray triggerfish as implemented in 2018 by Reef Fish Amendment 46.

| Year | OFL | ABC | Recreational ACL | Recreational ACT | Commercial ACL | Commercial ACT |
|---|---|---|---|---|---|---|
| **2019+** | 1,220,000 | 305,300 | 241,200 | 217,100 | 64,100 | 60,900 |

Note: Values are in pounds whole weight. Units are in the Marine Recreational Information Program's (MRIP) Coastal Household Telephone Survey (CHTS) data currency. The overfishing limit (OFL) reflects the SSC's January 2016 recommendation.

**Alternative 2:** Modify the ABC, ACLs, and ACTs for gray triggerfish based on the results of the 2020 interim analysis, the recommendations of the Council's SSC, and Reef Fish Advisory Panel (Reef Fish AP). Apply the ACL/ACT Control Rule to determine the buffer between the ACL and ACT for the recreational and commercial sectors, respectively.

| Year | OFL | ABC | Recreational ACL | Recreational ACT | Commercial ACL | Commercial ACT |
|---|---|---|---|---|---|---|
| **2021+** | 1,220,000 | 456,900 | 360,951 | 274,323 | 95,949 | 88,273 |

Note: Values are in pounds whole weight. Units are in MRIP-CHTS. The OFL reflects the SSC's January 2016 recommendation.

**Discussion**

**Alternative 1** (No Action) would retain the current catch limits defined in Amendment 37 to the Fishery Management Plan for Reef Fish Resources (Reef Fish FMP) in the Gulf of Mexico (GMFMC 2013), which used Amendment 30A to the Reef Fish FMP (GMFMC 2008) to determine the sector allocations (79% recreational, 21% commercial). **Alternative 1** also retains the Gulf of Mexico Fishery Management Council's (Council) Annual Catch Limit (ACL)/Annual Catch Target (ACT) Control Rule that determined the buffers between the sector ACLs and ACTs. Based on an ABC equal to 305,300 pounds (lbs) whole weight (ww), the commercial ACL was set equal to 64,100 lbs ww and the recreational ACL was set equal to 241,200 lbs ww. Currently, the commercial ACT is 60,900 lbs ww (commercial ACL reduced by 5%) and the recreational ACT is 217,100 lbs ww (recreational ACL reduced by 10%). The catch limits in **Alternative 1** do not reflect the Southeast Fisheries Science Center and Council's Scientific and Statistical Committee's (SSC) recent ABC recommendation based on the 2020 gray triggerfish interim analysis, or the Reef Fish Advisory Panel's request to set the total ACL equal to the ABC based on that interim analysis. The stock is still in a rebuilding plan, and is currently considered not overfished and not experiencing overfishing. After review of the interim analysis and its catch limit recommendations, the SSC found the gray triggerfish interim analysis to be suitable

for management advice, and also recommended the ABC be increased from 305,300 lbs ww to 456,900 lbs ww for 2021 and subsequent fishing years (**Alternative 2**). The SSC did not recommend changes to the overfishing limit (OFL), and therefore the current OFL of 1,220,000 lbs ww is retained. However, as discussed above, this assumes the SSC's previous OFL recommendation from January 2016 had been adopted in Amendment 46 to the Reef Fish FMP because otherwise, the SSC's ABC recommendation and alternatives provided in that document would exceed the previously established OFL of 401,600 lbs ww. Therefore, the OFL in **Alternative 1** and **Alternative 2** are the same and reflect the SSC's January 2016 recommendation (1.22 million lbs ww).

Under the current sector allocations, **Alternative 2** would increase the recreational ACL to 360,951 lbs ww and the commercial ACL to 95,949 lbs ww. **Alternative 2** also applies the Council's ACL/ACT Control Rule to calculate a new buffer of 24% between the recreational ACL and ACT (ACT = 274,323 lbs ww**)**, and an 8% buffer between the commercial ACL and ACT (ACT = 88,273 lbs ww**)**. These buffers were determined by comparing the sector-specific landings and ACLs for the years 2016-2019, and by considering the method by which quota monitoring is performed and stock condition. Similarly, increasing the buffers between the ACL and ACT for both sectors was presented as an alternative in Amendment 46 to the Reef Fish FMP (GMFMC 2017b). However, the Council chose to take no action at that time. Increasing the buffers may help constrain landings below the respective ACLs and prevent post-season payback accountability measures. Both sector ACLs have been exceeded multiple times since 2008 (Table 1.1.1 and 1.1.2); however, the recreational sector has experienced more overages than the commercial sector. Applying the Council's ACL/ACT Control Rule to the SSC recommended catch levels represents the best available science; thus, this is provided as the only reasonable alternative to **Alternative 1**.

Although gray triggerfish recreational landings are currently recorded using the Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES), they are back-calibrated to MRIP-Coastal Household Telephone Survey (CHTS) to be directly comparable to the catch limits, which if updated in this action, will remain in MRIP-CHTS for quota monitoring purposes. Updating the catch limits to the MRIP-FES data currency will require a new stock assessment.

# CHAPTER 3. AFFECTED ENVIRONMENT

## 3.1 Description of the Physical Environment

The physical environment for Gulf of Mexico (Gulf) reef fish is detailed in the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004), Generic Amendment 3 (GMFMC 2005), and the Generic Annual Catch Limits (ACL)/Accountability Measures (AM) Amendment (GMFMC 2011a), which are hereby incorporated by reference.

The Gulf has a total area of approximately 600,000 square miles (1.5 million $km^2$), including state waters (Gore 1992). It is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel (Figure 3.1.1). 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 73 through 83º F (23-28º C) including bays and bayous (Figure 3.1.1) between 1982 and 2009, according to satellite-derived measurements.[3] In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

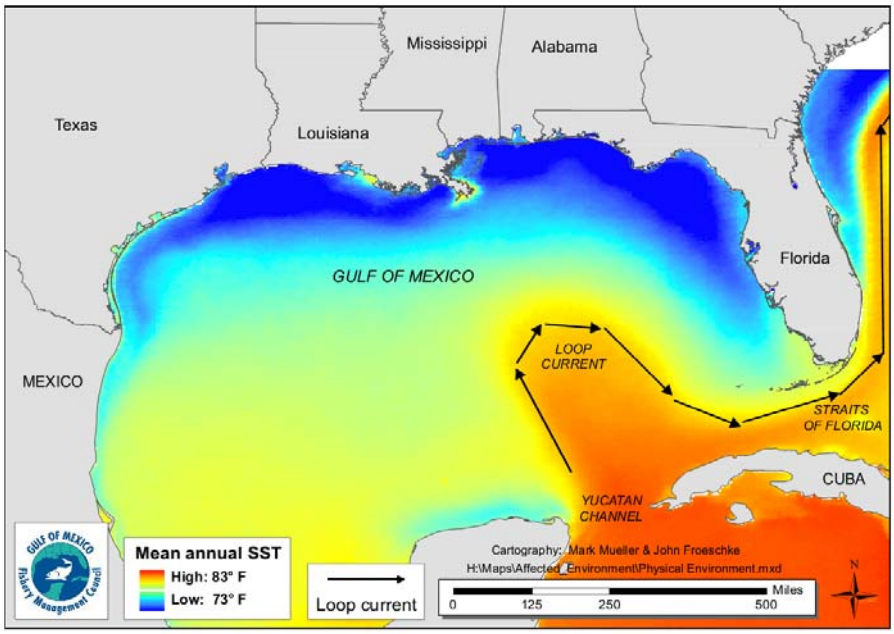


**Figure 3.1.1.** Mean annual sea surface temperature derived from the Advanced Very High-Resolution Radiometer Pathfinder Version 5 sea surface temperature data set.[4]

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

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

## Habitat Areas of Particular Concern (HAPC) and Environmental Sites of Special Interest Relevant to Reef Fish

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 (Reef Fish FMP) (GMFMC 2011b) and Amendment 9 to the Fishery Management Plan for the Coral and Coral Reefs of the Gulf of Mexico, U.S. Waters (GMFMC 2018), which are hereby incorporated by reference. There are environmental sites of special interest that are discussed in the Generic EFH Amendment (GMFMC 2004) that are relevant to gray triggerfish management and are hereby incorporated by reference. Some of these areas include the longline/buoy area closure, the Edges Marine Reserve, Tortugas North and South Marine Reserves, individual reef areas and bank HAPC of the northwestern Gulf, the Florida Middle Grounds HAPC, the Pulley Ridge HAPC, and Alabama Special Management Zone.

## 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). For 2020, the extent of the hypoxic area was estimated to be 2,117 square miles and is the third smallest area mapped since 1985. This in part can be attributed to multiple storm events that occurred in the Louisiana area in 2020, and why the 5-year hypoxic area average, which is 5,408 square miles, is important to consider. However, both the average and the low 2020 extent are still larger than the 1,930 square mile goal set by the federal-state Hypoxia Task Force to be reached by 2035.[5] 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 are able to detect lower dissolved oxygen levels and move away from hypoxic conditions. Therefore, these organisms are indirectly affected by limited prey availability and constrained available habitat (Baustian and Rabalais 2009; Craig 2012).

## Greenhouse gases

The Intergovernmental Panel on Climate Change (IPCC) has indicated greenhouse gas emissions are one of the most important drivers of recent changes in climate. Wilson et al. (2017) inventoried the sources of greenhouse gases in the Gulf from sources associated with oil platforms and those associated with other activities such as fishing. A summary of the results of the inventory are shown in Table 3.1.2 with respect to total emissions and from fishing. Commercial fishing and recreational vessels make up a small percentage of the total estimated greenhouse gas emissions from the Gulf (2.04% and 1.67%, respectively).

[5] http://gulfhypoxia.net

**Table 3.1.2.** 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

### 3.2.1 Gray Triggerfish

A complete description of the biological/ecological environment can be found in Chapter 3 of Amendment 46 to the Reef Fish FMP (GMFMC 2017b). That description is summarized in the following sections and incorporated herein by reference.

**Gray Triggerfish Life History and Biology**

Larval and juvenile gray triggerfish are found associated with *Sargassum* spp. mats in late summer and fall (Bortone et al. 1977; Dooley 1972; Fahay 1975; Wells and Rooker 2004). Adult gray triggerfish are closely associated with both natural and artificial reefs (Frazer and Lindberg 1994; Ingram 2001; Johnson and Saloman 1984; Kurz 1995; Lingo and Szedlmayer 2006; Simmons and Szedlmayer 2011; Vose and Nelson 1994) and are estimated to have high site fidelity (Ingram and Patterson 2001). Adult gray triggerfish are also found over soft bottom, where they lay their eggs in depressions in the sand substrate (Simmons and Szedlmayer 2011).

Studies conducted in the Gulf and South Atlantic Bight have found that peak spawning occurs during the months of June and July. However, spawning can occur as early as May and as late as August (Hood and Johnson 1997; Ingram 2001; Moore 2001; Simmons and Szedlmayer 2012; Wilson et al. 1995). Both sexes are reproductively mature by age-2, 10 inches fork length (FL) (250 mm FL) (Ingram 2001; Wilson et al. 1995) with some fish as young as age-0 being mature

as well (Jefferson et al. 2019). Male gray triggerfish establish territories, build nests, and form harems (one male and several females) (Simmons and Szedlmayer 2012). Eggs are laid in a gelatinous matrix in the bottom of the nest. After fertilization, female gray triggerfish provide parental care while the male defends his territory and courts other female gray triggerfish on the reef (Simmons and Szedlmayer 2012).

There have been relatively few age and growth studies on gray triggerfish; however, this species is estimated to live up to 11 years, with 16 being the maximum age recorded (Hood and Johnson 1997; Ingram 2001; Panama City National Marine Fisheries Service (NMFS) Database, accessed 2020; Wilson et al. 1995). Gray triggerfish is estimated to grow rapidly within the first year of life then growth slows for both sexes combined (Hood and Johnson 1997; Ingram 2001; Wilson et al. 1995). Sexual dimorphism is evident with male gray triggerfish being significantly larger than females (Hood and Johnson 1997; Ingram 2001; Jefferson et al. 2019; Simmons and Szedlmayer 2012). Research for SEDAR 62 (2019) was conducted using samples processed from 1999 through 2017 at the NMFS Panama City Laboratory from both fishery-dependent and fishery-independent samples in the Gulf. The samples showed a maximum recorded length of gray triggerfish being 26 inches FL (697 mm FL). The maximum weight recorded was 12.6 lbs gw (5.7 kg). The maximum age (using spines) recorded was 14 years old. However, there were minimal samples at this size, weight, and/or age. Most fish sampled were 16-18 inches FL (400-450 mm FL) and 4 years old (Allman et al. 2019).

**Stock Status History of Gray Triggerfish**

The first gray triggerfish assessments concluded the stock was overfished and undergoing overfishing (Porch 2001; Valle et al. 2001). This assessment of the stock did not change in the next assessment, SEDAR 9 (2006). A 6-year rebuilding plan was implemented in Amendment 30A (GMFMC 2008). An update assessment (SEDAR 9 Update 2011) indicated the stock was still overfished and experiencing overfishing, and would not be rebuilt by 2013. Amendment 37 (GMFMC 2012) implemented a new rebuilding plan to rebuild the stock in 5 years. The next stock assessment (SEDAR 43 2015) of Gulf gray triggerfish was reviewed by the Scientific and Statistical Committee (SSC) in October 2015. The assessment indicated that gray triggerfish was no longer experiencing overfishing, but remained overfished. In November 2015, NMFS notified the Council that the gray triggerfish stock was not making adequate progress toward rebuilding. Based on SSC recommendations and Council discussion, the Council requested additional data and analyses from the Southeast Fisheries Science Center (SEFSC) for subsequent review by the SSC. The Council requested the SEFSC complete six projection scenarios with specific rebuilding targets of 8, 9, and 10 years and assuming two recruitment scenarios (low, high) due to recruitment concerns raised during the SEDAR 43 stock assessment. The Council ultimately chose a 9-year rebuilding plan, which would rebuild the stock by 2025. To generate catch advice for the new rebuilding plan established in Amendment 46 (GMFMC 2017b), the SSC used the "low recruitment scenario" for 2014-2018, with fleet selectivity, discards, and retention held constant.

The implementation of Amendment 44 to the Reef Fish FMP (GMFMC 2017a) changed the gray triggerfish status determination criteria (SDC) for minimum stock size threshold (MSST), resulting in the stock no longer determined to be overfished. The SEDAR 62 (2019) stock

assessment was intended to update catch advice using data through 2017; however, the assessment was withdrawn due to various impediments that will be addressed in a future research track stock assessment. Therefore, SEDAR 43 is the last full stock assessment to be accepted for gray triggerfish with a terminal data year of 2013. However, a 2020 Interim Analysis determined the stock is not overfished or undergoing overfishing and provided catch advice, but was unable to determine if the current rebuilding timeline is being met. The next full assessment is scheduled to begin in 2024. This assessment will update the gray triggerfish stock status and determine if rebuilding has been met.

### 3.2.2 General Information on Reef Fish Species

The National Ocean Service collaborated with NMFS and the Council to develop distributions of reef fish (and other species) in the Gulf (SEA 1998). Reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. In general, both eggs and larval stages are planktonic. Larval fish feed on zooplankton and phytoplankton. Gray triggerfish are exceptions to this generalization as they lay their eggs in nests on the sandy bottom (Simmons and Szedlmayer 2012), and gray snapper whose larvae are found around submerged aquatic vegetation.

**Status of Reef Fish Stocks**

The Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico (Reef Fish FMP) currently encompasses 31 species. The NMFS Office of Sustainable Fisheries updates its Status of U.S. Fisheries Report to Congress[6] on a quarterly basis. Stock assessments and status determinations have been conducted and designated for many reef fish stocks and can be found on the Council[7] and the SEDAR[8] websites.

Of the stocks for which stock assessments have been conducted, the last quarter report of the 2020 Status of U.S. Fisheries classifies only one as overfished (greater amberjack), and four stocks as undergoing overfishing (lesser amberjack, almaco jack, banded rudderfish, and lane snapper).

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

A stock assessment was conducted for Atlantic goliath grouper (SEDAR 47 2016). The Council's SSC accepted the assessment's general findings that the stock was not overfished nor

[6] https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates

[7] www.gulfcouncil.org

[8] www.sedarweb.org

experiencing overfishing. Although the SSC determined Atlantic goliath grouper to not be experiencing overfishing, the SSC deemed the assessment not suitable for stock status determination and management advice.

Stock assessments were conducted for seven reef fish stocks (including lane snapper) using the Data Limited Methods Toolkit (DLMToolkit; SEDAR 49 2016). This method allows the setting of the overfishing limit (OFL) and acceptable biological catch (ABC) based on limited data and life history information, but does not provide assessment-based status determinations. Several stocks did not have enough information available to complete an assessment even using the DLMToolkit.

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

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

| Common Name | Scientific Name | Stock Status | | Most recent assessment or SSC workshop |
|---|---|---|---|---|
| | | Overfishing | Overfished | |
| **Family Balistidae – Triggerfishes** | | | | |
| gray triggerfish | *Balistes capriscus* | N | N | SEDAR 43 2015 |
| **Family Carangidae – Jacks** | | | | |
| greater amberjack | *Seriola dumerili* | N | Y | SEDAR 70 2020 |
| lesser amberjack | *Seriola fasciata* | Y | Unknown | SEDAR 49 2016 |
| almaco jack | *Seriola rivoliana* | Y | Unknown | SEDAR 49 2016 |
| banded rudderfish | *Seriola zonata* | Y | Unknown | |
| **Family Labridae – Wrasses** | | | | |
| hogfish | *Lachnolaimus maximus* | N | N | SEDAR 37 2014 |
| **Family Malacanthidae – Tilefishes** | | | | |
| tilefish (golden) | *Lopholatilus chamaeleonticeps* | N | N | SEDAR 22 2011a |
| blueline tilefish | *Caulolatilus microps* | N | Unknown | |
| goldface tilefish | *Caulolatilus chrysops* | N | Unknown | |
| **Family Serranidae – Groupers** | | | | |
| gag | *Mycteroperca microlepis* | N | N | SEDAR 33 Update 2016b |
| red grouper | *Epinephelus morio* | N | N | SEDAR 42 2015 |
| Scamp | *Mycteroperca phenax* | Unknown | Unknown | |
| black grouper | *Mycteroperca bonaci* | N | N | SEDAR 19 2010 |
| yellowedge grouper | *Hyporthodus flavolimbatus* | N | N | SEDAR 22 2011b |
| snowy grouper | *Hyporthodus niveatus* | N | Unknown | SEDAR 49 2016 |
| speckled hind | *Epinephelus drummondhayi* | N | Unknown | SEDAR 49 2016 |
| yellowmouth grouper | *Mycteroperca interstitialis* | Unknown | Unknown | SEDAR 49 2016 |
| yellowfin grouper | *Mycteroperca venenosa* | Unknown | Unknown | |
| warsaw grouper | *Hyporthodus nigritus* | N | Unknown | |
| *Atlantic goliath grouper | *Epinephelus itajara* | N | Unknown | SEDAR 47 2016 |
| **Family Lutjanidae – Snappers** | | | | |
| queen snapper | *Etelis oculatus* | N | Unknown | |
| mutton snapper | *Lutjanus analis* | N | N | SEDAR 15A Update 2015 |
| blackfin snapper | *Lutjanus buccanella* | N | Unknown | |
| red snapper | *Lutjanus campechanus* | N | N | SEDAR 31 Update 2015 |
| cubera snapper | *Lutjanus cyanopterus* | N | Unknown | |
| gray snapper | *Lutjanus griseus* | N | N | |
| lane snapper | *Lutjanus synagris* | Y | Unknown | SEDAR 49 Update 2019 |
| silk snapper | *Lutjanus vivanus* | N | Unknown | |
| yellowtail snapper | *Ocyurus chrysurus* | N | N | SEDAR 27A 2012 |
| vermilion snapper | *Rhomboplites aurorubens* | N | N | SEDAR 45 2016 |
| wenchman | *Pristipomoides aquilonaris* | N | Unknown | SEDAR 49 2016 |

Note: *Atlantic goliath grouper is a protected grouper (i.e., ACL is set at zero) and benchmarks do not reflect appropriate stock dynamics. Species status based on the NOAA Quarter 4 2020 FSSI report.

### Bycatch

Details of previous bycatch estimates in the gray triggerfish portion of the reef fish fishery can be found in Appendix G (Bycatch Practicability Analysis) of Amendment 46 to the Reef Fish FMP (GMFMC 2017b), and is hereby incorporated by reference.

While bycatch occurs in the hook-and-line and trawl fisheries, gray triggerfish make up a small portion of species landed on trips. Previous studies have documented low hook-and-line discard mortality of gray triggerfish, with only 5% estimated to die after release (GMFMC 2017b). However, updated research conducted for SEDAR 62 (2019) shows that mean estimated discard survival across all 35 depths for North Carolina was 35% and for Florida was 34% (Runde et al. 2019). These results have implications for gray triggerfish management because the estimate of discard survival is substantially lower than previously assumed. In the shrimp trawl fishery, mortality is assumed to be 100%, with all gray triggerfish assumed to be age-0 (GMFMC 2017b). Recent bycatch reduction device requirements and a reduction in shrimping effort is expected to have reduced gray triggerfish bycatch. However, there are no new presumably lower bycatch rates from the observer program for gray triggerfish since those available for SEDAR 9 (2006) to inform the model and reduce the grey triggerfish bycatch estimates. Therefore, it is expected shrimp trawl bycatch is overestimated (Zhang 2020).

Given that gray triggerfish are normally caught as bycatch on trips targeting other reef fish species by hook-and-line, gray triggerfish discard mortality may be reduced if more fish are allowed to be harvested during the fishing season. Shrimp trawl bycatch and discard mortality is expected to stay the same due the age of fish caught.

**Protected Species**

The Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) provide special protections to some species that occur in the Gulf. A brief summary of these two laws and more information is available on the NMFS Law and Policy website.[9] All 22 marine mammals in the Gulf are protected under the MMPA. Three marine mammals (sperm whales, Bryde's whales, and manatees) are also protected under the ESA. Bryde's whales are the only resident baleen whales in the Gulf with the species recently being listed as endangered (84 FR 15488; April 15, 2019). Other species protected under the ESA include sea turtle species (Kemp's ridley, loggerhead (Northwest Atlantic Ocean distinct population segment [DPS]), green (South Atlantic and North Atlantic DPSs), leatherback, and hawksbill), five fish species (Gulf sturgeon, smalltooth sawfish, Nassau grouper, giant manta ray, and oceanic whitetip shark), and six coral species (elkhorn, staghorn, rough cactus, lobed star, mountainous star, and boulder star). Critical habitat designated under the ESA for smalltooth sawfish, Gulf sturgeon, and the Northwest Atlantic Ocean DPS of loggerhead sea turtles also occurs in the Gulf, though only loggerhead critical habitat occurs in federal waters.

The most recent biological opinion (opinion) on the Reef Fish FMP was completed on September 30, 2011 (NMFS 2011). The opinion determined the continued authorization of the Gulf reef fish fishery managed under the Reef Fish FMP is not likely to affect ESA-listed marine mammals or *Acropora* corals, and is not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback), or smalltooth sawfish. An incidental take statement was provided. Since issuing the opinion, in memoranda dated September 16, 2014, and October 7, 2014, NMFS concluded that the activities associated with the Reef Fish FMP are not likely to adversely affect critical habitat for the Northwest Atlantic

[9] https://www.fisheries.noaa.gov/topic/laws-policies

Ocean loggerhead sea turtle DPS or four newly listed species of corals (rough cactus, lobed star, mountainous star, and boulder star).

On April 6, 2016, NMFS and the U.S. Fish and Wildlife Service published a final rule (81 FR 20057) removing the range-wide and breeding population ESA-listings of the green sea turtle and listing eight DPSs as threatened and three DPSs as endangered, effective May 6, 2016. Two of the green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, occur in the Gulf and are listed as threatened. In addition, on June 29, 2016, NMFS published a final rule (81 FR 42268) listing Nassau grouper as threatened under the ESA. NMFS has reinitiated consultation on the Reef Fish FMP to address these listings. In a memorandum dated September 29, 2016, NMFS determined that allowing fishing under the Reef Fish FMP to continue during the re-initiation period is not likely to jeopardize the continued existence of the North Atlantic and South Atlantic DPSs of green sea turtles or Nassau grouper. Furthermore, 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 reinitiated consultation on the Reef Fish FMP to address the listings of the giant manta and oceanic whitetip and determined that allowing fishing under the Reef Fish FMP to continue during the revised re-initiation period is not likely to jeopardize the continued existence of listed sea turtle species, smalltooth sawfish, the green turtle DPSs, Nassau grouper, the giant manta, or the oceanic whitetip. Since the revised request for reinitiation of consultation, NMFS determined that the newly listed Gulf Bryde's whale may be affected by fishing managed under the Reef Fish FMP in a June 20, 2019, memorandum. In that same June 20, 2019, memorandum, NMFS concluded that the activities associated with the Reef Fish FMP were not likely to jeopardize the continued existence of the Bryde's whale during the revised reinitiation period.

There is no information to indicate marine mammals and birds rely on gray triggerfish for food, and they are not generally caught by fishers harvesting gray triggerfish. Primary gear types used in the Gulf reef fish fishery are classified in the Final List of Fisheries for 2021 (86 FR 3028) as Category III gear. This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to one percent of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock, while allowing that stock to reach or maintain its optimum sustainable population. Additionally, there is no evidence that the indirect gray triggerfish fishery is adversely affecting seabirds.

### ***Deepwater Horizon*** **MC252 Oil Spill**

*General Impacts on Fishery Resources*

The presence of polycyclic aromatic hydrocarbons (PAH), which are highly toxic chemicals that tend to persist in the environment for long periods of time, in marine environments can have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2012). The future reproductive success of long-lived species, including many reef fish species, may be negatively affected by episodic events resulting in high-mortality years or low recruitment. These episodic events could leave gaps in the age

structure of the population, thereby affecting future reproductive output (Mendelssohn et al. 2012). Other studies have described the vulnerabilities of various marine finfish species, with morphological and/or life history characteristics similar to species found in the Gulf, to oil spills and dispersants (Hose et al. 1996; Carls et al. 1999; Heintz et al. 1999; Short 2003).

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. The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern.

**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).[10] 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[11] predicts the average sea surface temperature in the Gulf will increase by 1-3ºC for 2010-2070 compared to the average over the years 1950-2010. For reef fishes, 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 (Gobler 2020; Hollowed et al. 2013; Maynard et al. 2015; Sokolow 2009; Wells et al. 2015). 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 (Chagaris 2019; Gruss et al. 2017; King and McFarlane 2006; Pinsky and Mantua 2014). While complex, these factors do not change the reality of climate change impacts on managed species and the need to incorporate

[10] http://www.ipcc.ch/

[11] https://www.esrl.noaa.gov/psd/ipcc/

this information into stock assessments. Better planning and collaboration with managers is currently being pursued to include this type of data into the assessment process.

**Red Tide**

Red tide is a common name for harmful algal blooms caused by species of dinoflagellates and other organisms that cause the water to appear to be red. Red tide blooms occur in the Gulf almost every year, generally in late summer or early fall. They are most common off the central and southwestern coasts of Florida between Clearwater and Sanibel Island but may occur anywhere in the Gulf. More than 50 species capable of causing red tides occur in the Gulf, but one of the best-known species is *Karenia brevis* (Steindinger 2009). This organism produces toxins capable of killing fish, birds and other marine animals along with causing respiratory irritation in humans (Asai et al. 1982; Flewelling et al. 2005; Hemmert, 1975; Kirkpatrick et al. 2004; Landsberg et al. 2009). The effects of red tide on fish stocks have been well established. In 2005 and 2014, severe red tide events occurred in the Gulf along with an associated large decline in multiple abundance indices for red grouper, gag, and other species thought to be susceptible to mortality from red tide events (Chagaris and Sinnickson 2018; Flaherty and Landsberg 2011; Hu et al. 2015; Walter et al. 2013). Mortality occurs via absorption of toxins across gill membranes (Abbott et al. 1975; Baden 1988), ingestion of toxic biota (Flewelling et al. 2005; Landsberg 2002; Landsberg et al. 2009), from some indirect effect such as hypoxia (Walter et al. 2013) or from a combination of these effects. Gray triggerfish are found within fish communities of species negatively affected by high mortality due to red tide. However, although their abundance varied, studies have shown that gray triggerfish that remained in red tide areas were able to survive, suggesting that the stock is more tolerant and resilient to environmental stresses (Dupont and Coy 2008; DuPont et al. 2010).

## 3.3 Description of the Economic Environment

Economic information pertaining to gray triggerfish can be found in Amendment 46 to the Reef Fish FMP (GMFMC 2017b) and is incorporated herein by reference. The following section contains select updated information on the economic environment of the Gulf gray triggerfish portion of the reef fish fishery, broken down by sector. Inflation adjusted revenues and prices are reported in 2019 dollars using the annual, non-seasonally adjusted Gross Domestic Product (GDP) implicit price deflator provided by the U.S. Bureau of Economic Analysis (BEA).

### 3.3.1 Commercial Sector

**Permits**

Any fishing vessel that harvests and sells any of the reef fish species managed under the Reef Fish FMP from the Gulf exclusive economic zone (EEZ) must have a valid Gulf reef fish permit. As of December 8, 2020, there were 831 limited access valid or renewable reef fish permits, 62 of which had longline endorsements. Commercial harvest of Gulf gray triggerfish in the EEZ may only be sold to dealers with a federal dealer permit. As of December 8, 2020, there were 380 entities with a federal Gulf and South Atlantic Dealers permit.

**Total Landings and Dockside Revenue**

Gulf gray triggerfish is managed under a stock ACL that is specified and monitored in terms of pounds (lbs) whole weight (ww). Both gray triggerfish landings and revenue increased steadily from 2015 through 2019, with the exception of a small dip in landings in 2019 (Table 3.3.1.1). Florida accounted for the vast majority of these landings and associated revenue (Table 3.3.1.1). The average annual ex-vessel price for gray triggerfish during the time period was approximately $2.05 per lb ww (2019 dollars).

**Table 3.3.1.1**. Commercial Gulf gray triggerfish landings (lbs ww) and revenue (2019 dollars) by state.

| | AL | FL | LA/MS* | TX | Total |
|---|---|---|---|---|---|
| | Landings (lbs ww) | | | | |
| 2015 | 3,289 | 41,567 | 2,633 | 518 | 48,007 |
| 2016 | 4,512 | 51,646 | 2,674 | 912 | 59,744 |
| 2017 | 4,017 | 56,545 | 2,404 | 298 | 63,264 |
| 2018 | 3,968 | 59,946 | 1,162 | 253 | 65,329 |
| 2019 | 3,535 | 57,987 | 976 | 195 | 62,693 |
| Average | 3,864 | 53,538 | 1,970 | 435 | 59,807 |
| | Dockside Revenue (2019 $) | | | | |
| 2015 | $ 6,761 | $ 87,604 | $ 3,377 | $ 604 | $ 98,347 |
| 2016 | $ 9,847 | $ 103,330 | $ 3,312 | $ 1,728 | $ 118,216 |
| 2017 | $ 9,069 | $ 115,101 | $ 3,275 | $ 431 | $ 127,876 |
| 2018 | $ 9,140 | $ 122,100 | $ 1,538 | $ 380 | $ 133,158 |
| 2019 | $ 10,109 | $ 124,136 | $ 1,490 | $ 296 | $ 136,031 |
| Average | $ 8,985 | $ 110,454 | $ 2,598 | $ 688 | $ 122,725 |

Source: Southeast Fisheries Science Center (SEFSC) Commercial ACL Dataset (October 2020)
*Louisiana and Mississippi are combined for confidentiality purposes.

**Vessels, Trips, Landings, and Dockside Revenue**

The following summaries of landings, revenue, and effort (Tables 3.3.1.2 and 3.3.1.3) are based on logbook information and the NMFS Accumulated Landings System (ALS) for prices. Therefore, the values contained in this section may not match exactly with landings and revenue values presented elsewhere in this document that used ACL monitoring data. In addition, the landings are presented in gutted weight (gw) rather than in ww. Landings for all species in the SEFSC Social Science Research Group's (SEFSC-SSRG) Socioeconomic Panel data are expressed in gw to provide one unit for all species. This is because data summarizations, as presented in Tables 3.3.1.2 and 3.3.1.3 below, generally involve a multitude of species. It is also important to note that federally-permitted vessels that are required to submit logbooks generally report their harvest of most species regardless of whether the fish were caught in state or federal waters.

The number of federally permitted commercial vessels that harvested gray triggerfish in the Gulf was fairly stable from 2015 through 2019 with a peak in participation in 2017 (Table 3.3.1.2). Gray triggerfish landings and associated ex-vessel revenue increased steadily over the time period and reached 5-year highs in 2019 (Tables 3.3.1.2 and 3.3.1.3). On average (2015 through 2019), vessels that landed gray triggerfish did so on approximately 33% of their Gulf trips, but gray triggerfish comprised less than 0.3% of their annual revenue from all species (Tables 3.3.1.2 and 3.3.1.3). Average annual revenue per vessel for all species harvested by these vessels experienced a downward trend from 2015 through 2019, with an overall decrease of approximately 19% (Table 3.3.1.3). Estimates of net revenue specific to the vessels affected by this amendment are not readily available; however, it is assumed there is an overlap between these vessels and vessels that participate in the commercial Gulf reef fish fishery in general. According to Overstreet and Liese (2018), annual net revenue from operations for commercial vessels in the reef fish fishery was approximately 34% of their average annual gross revenue from 2014 through 2016.[12] Applying this percentage to the results provided in Table 3.3.1.3 would result in an estimated per vessel average annual net revenue from operations of $53,703 (2019 dollars) per year.

**Table 3.3.1.2.** Number of vessels, number of trips, and landings (lbs gw) by year for gray triggerfish.

| Year | # of vessels that caught gray triggerfish (> 0 lbs gw) | # of trips that caught gray triggerfish | gray triggerfish landings (lbs gw) | Other species' landings jointly caught w/ gray triggerfish (lbs gw) | # of Gulf trips that only caught other species | Other species' landings on Gulf trips w/o gray triggerfish (lbs gw) | All species landings on South Atlantic trips (lbs gw) |
|---|---|---|---|---|---|---|---|
| 2015 | 232 | 1,298 | 39,850 | 3,609,672 | 2,590 | 6,344,319 | 71,465 |
| 2016 | 277 | 1,513 | 50,915 | 4,243,998 | 3,295 | 7,097,005 | 16,782 |
| 2017 | 283 | 1,478 | 51,108 | 3,811,417 | 2,917 | 6,619,145 | 101,375 |
| 2018 | 262 | 1,213 | 53,406 | 2,838,244 | 2,664 | 5,682,080 | 49,136 |
| 2019 | 261 | 1,336 | 59,022 | 3,171,464 | 2,541 | 5,356,112 | 35,216 |
| Average | 263 | 1,368 | 50,860 | 3,534,959 | 2,801 | 6,219,732 | 54,795 |

Source: SEFSC-SSRG Socioeconomic Panel v.11 (09/04/2020)

[12] The percentage estimates have been rounded to the closest full percentage point for current purposes based on guidance from the report's authors.

**Table 3.3.1.3.** Number of vessels and ex-vessel revenues by year (2019 dollars) for gray triggerfish.

| Year | # of vessels that caught gray triggerfish (> 0 lbs gw) | Dockside revenue from gray triggerfish | Dockside revenue from 'other species' jointly caught w/ gray triggerfish | Dockside revenue from 'other species' caught on Gulf trips w/o gray triggerfish | Dockside revenue from 'all species' caught on South Atlantic trips | Total dockside revenue | Average total dockside revenue per vessel |
|---|---|---|---|---|---|---|---|
| 2015 | 232 | $84,111 | $14,578,062 | $26,683,186 | $273,092 | $41,618,451 | $179,390 |
| 2016 | 277 | $105,846 | $17,564,637 | $29,620,523 | $59,493 | $47,350,500 | $170,940 |
| 2017 | 283 | $108,781 | $15,461,847 | $27,736,584 | $368,708 | $43,675,920 | $154,332 |
| 2018 | 262 | $112,093 | $11,950,902 | $24,535,099 | $191,739 | $36,789,833 | $140,419 |
| 2019 | 261 | $133,038 | $13,804,131 | $23,702,435 | $120,729 | $37,760,333 | $144,676 |
| Average | 263 | $108,774 | $14,671,916 | $26,455,565 | $202,752 | $41,439,008 | $157,951 |

Source: SEFSC-SSRG Socioeconomic Panel v.11 (09/04/2020)

**Imports**

Imports of seafood products compete in the domestic seafood market and have in fact dominated many segments of the seafood market. Imports affect the price for domestic seafood products and tend to set the price in the market segments in which they dominate. Seafood imports have downstream effects on the local fish market. At the harvest level for reef fish in general and gray triggerfish in particular, imports affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to domestic production of reef fish, including gray triggerfish, imports tend to cushion the adverse economic effects on consumers resulting from a reduction in domestic landings. Imports data for gray triggerfish are not available; however, imported snapper may be considered a reasonable substitute for gray triggerfish. The following describes recent trends in snapper imports.

Imports[13] of fresh snapper increased from 26.1 million pounds product weight (pw) in 2015 to 32.8 million pounds pw in 2019. Total revenue from fresh snapper imports increased from $84.7 million (2019 dollars[14]) in 2015 to a five-year high of $109.5 million in 2019. Imports of fresh snappers primarily originated in Mexico, Central America, or South America, and entered the U.S. through the port of Miami. Imports of fresh snapper were highest on average (2015 through 2019) during the months of March through August.

[13] NOAA Fisheries Service purchases fisheries trade data from the Foreign Trade Division of the U.S. Census Bureau. Data are available for download at https://www.fisheries.noaa.gov/national/sustainable-fisheries/foreign-fishery-trade-data

[14] Converted to 2019 dollars using the annual, non-seasonally adjusted GDP implicit price deflator provided by the U.S. BEA.

Imports of frozen snapper were substantially less than imports of fresh snapper from 2015 through 2019. During this time, frozen snapper imports ranged from 11.4 million pounds pw to 14.4 million pounds pw and the value of these imports ranged from $34.8 million (2019 dollars) to $40.3 million. Imports of frozen snapper primarily originated in South America (especially Brazil), Indonesia, and Mexico. The majority of frozen snapper imports entered the U.S. through the ports of Miami and New York. Imports of frozen snappers tended to be lowest during February through June when fresh snapper imports were strong.

**Business Activity**

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

Estimates of the U.S. average annual business activity associated with the commercial harvest of gray triggerfish in the Gulf were derived using the model developed for and applied in NMFS (2018) and are provided in Table 3.3.1.4.[15] This business activity is characterized as jobs (full- and part-time), output impacts (gross business sales), income impacts (wages, salaries, and self-employed income), and value-added impacts, which represent the contribution made to the U.S. GDP. These impacts should not be added together because this would result in double counting. It should be noted that the results provided should be interpreted with caution and demonstrate the limitations of these types of assessments. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species. Separate models to address individual species are not available. For example, the results provided here apply to a general "all other finfish" category rather than just gray triggerfish, and a harvester job is "generated" for approximately every $35,000 (2019 dollars) in ex-vessel revenue. These results contrast with the number of harvesters (vessels) with recorded landings of gray triggerfish presented in Table 3.3.1.2 and Table 3.3.1.3.

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

**Table 3.3.1.4**. Average annual business activity (2015 through 2019) associated with the commercial harvest of gray triggerfish in the Gulf. All monetary estimates are in 2019 dollars.

| Species | Average Ex-vessel Value ($ thousands) | Total Jobs | Harvester Jobs | Output (Sales) Impacts ($ thousands) | Income Impacts ($ thousands) | Value Added ($ thousands) |
|---|---|---|---|---|---|---|
| Gray Triggerfish | $109 | 14 | 3 | $1,082 | $392 | $557 |

Source: Calculated by NMFS Southeast Regional Office (SERO) using the model developed for and applied in NMFS (2018).

## 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. 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 because larger concentrations of fish are required to satisfy larger groups of anglers.

### Landings

Recreational landings of gray triggerfish fluctuated from 2015 through 2019, with a peak in 2016 (Figure 3.3.2.1). The majority of estimated landings were from private/rental vessel trips, although there were substantial landings from charter and headboat vessels as well (Figure 3.3.2.1). There were few if any estimated landings from shore (Figure 3.3.2.1). On average (2015 through 2019), approximately 71% of estimated recreational gray triggerfish landings were attributed to Florida, with most of the remainder coming from Alabama (Figure 3.3.2.2).

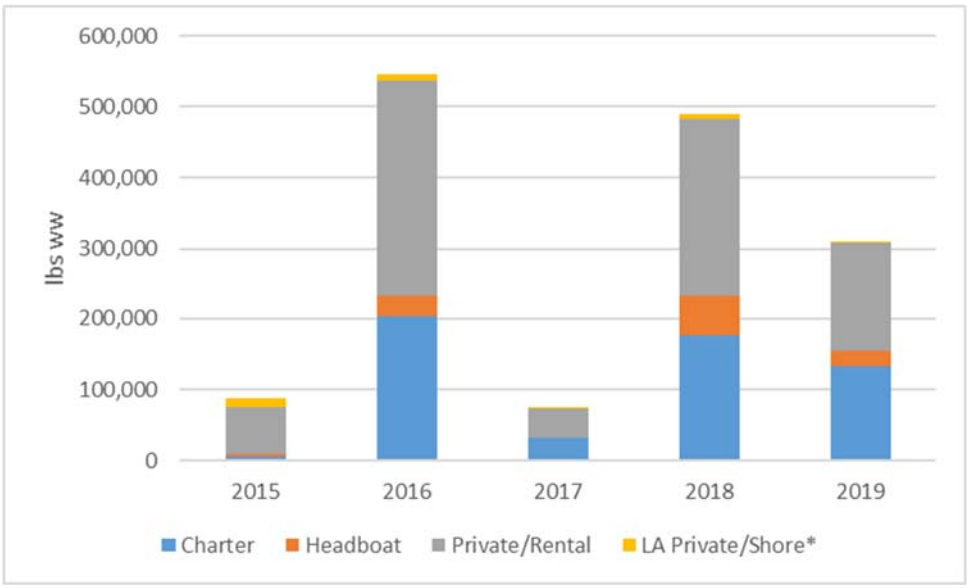


**Figure 3.3.2.1**. Recreational landings of Gulf gray triggerfish by mode.
Source: SEFSC Recreational ACL data MRIPACLspec_rec81_20wv3_14Sep20wLACreel_2014_2019.xls (Accessed Dec. 2020).
*The Louisiana Department of Wildlife and Fisheries does not differentiate between private and shore modes in its LA Creel data collection program.

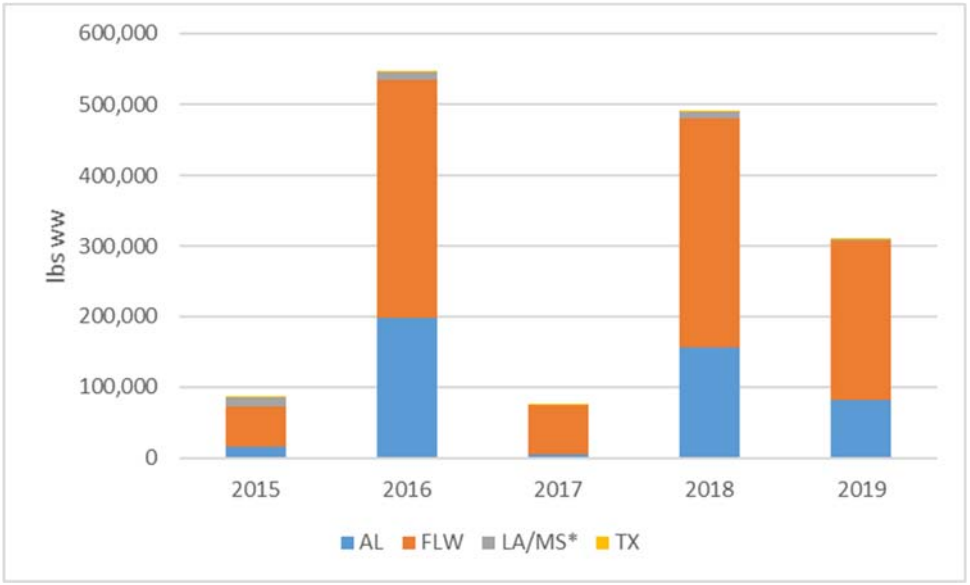


**Figure 3.3.2.2**. Recreational landings of Gulf gray triggerfish by state.
Source: SEFSC Recreational ACL data MRIPACLspec_rec81_20wv3_14Sep20wLACreel_2014_2019.xls (Accessed Dec. 2020).
Note: FLW refers to the west coast of Florida.
*LA and MS are combined for confidentiality purposes.

## Permits

For-hire vessels are required to have a Gulf charter/headboat permit for reef fish (for-hire permit) to fish for or possess reef fish species in the Gulf EEZ. These are limited access permits. On

December 8, 2020, there were 1,305 vessels with a valid (non-expired) or renewable[16] for-hire reef fish permit (including historical captain permits). Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, only federally permitted headboats are required to submit harvest and effort information to the NMFS Southeast Region Headboat Survey (SRHS).[17] Participation in the SRHS is based on determination by the SEFSC that the vessel primarily operates as a headboat. As of February 8, 2020, 69 Gulf headboats were registered in the SRHS (K. Fitzpatrick, NMFS SEFSC, pers. comm.). The majority of these headboats were located in Florida (39), followed by Texas (16), Alabama (9), and Mississippi/Louisiana (5).

Information on Gulf charter vessel and headboat operating characteristics is included in Savolainen et al. (2012) and is incorporated herein by reference.

There are no specific federal permitting requirements for recreational anglers to fish for or harvest reef fish species, including gray triggerfish. Instead, anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. As a result, it is not possible to identify with available data how many individual anglers would be expected to be affected by this action.

**Angler Effort**

Recreational effort derived from the Marine Recreational Information Program (MRIP) database can be characterized in terms of the number of trips as follows:

- Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or 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.

[16] A renewable permit is an expired permit that may not be actively fished, but is renewable for up to one year after expiration.

[17] All federal charter/headboat permit holders, including charter vessel owners or operators, are be required to comply with the new Southeast For-Hire Electronic Reporting Program as of January 5, 2021. Under this program, all such permit holders must declare trips prior to departure and submit electronic fishing reports prior to offloading fish, or within 30 minutes after the end of a trip, if no fish are landed. Those vessels selected to report to the SRHS (i.e., federally permitted headboats) will continue to submit their reports under the new requirements directly to the SRHS program. For more information, see: https://www.fisheries.noaa.gov/southeast/recreational-fishing-data/southeast-hire-electronic-reporting-program?utm_medium=email&utm_source=govdelivery

A target trip may be considered an angler's revealed preference for a certain species, and thus may carry more relevant information when assessing the economic effects of regulations on the subject species than the other two measures of recreational effort. Given the subject nature of this action, the following discussion focuses on target trips for gray triggerfish in the Gulf.

It is important to note that in 2018, MRIP transitioned from the old Coastal Household Telephone Survey (CHTS) to a new mail-based fishing effort survey (FES). The estimates presented in Table 3.3.2.1 are calibrated to the FES and may be greater than estimates that are non-calibrated.[18] The vast majority of the estimated target trips for gray triggerfish in the Gulf from 2015 through 2019 were taken in Florida and the dominant mode of fishing was the private/rental mode (Table 3.3.2.1). Target trips for gray triggerfish fluctuated widely from 2015 through 2019, with a peak in 2018 (Table 3.3.2.1).

[18] As of August 2018, all directed trip estimate information provided by MRIP (public use survey data and directed trip query results) for the entire time series were updated to account for both the Access Point Angler Intercept Survey (APAIS) design change in 2013, as well as the transition from the CHTS to the FES in 2018. Back-calibrated estimates of directed effort are not available. For more information, see: https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-estimate-updates

**Table 3.3.2.1**. Gulf gray triggerfish recreational target trips, by mode and state, 2015-2019.*

| | Alabama | Florida | Mississippi | Total |
|---|---|---|---|---|
| | **Shore Mode** | | | |
| 2015 | 0 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 | 0 |
| 2018 | 0 | 0 | 0 | 0 |
| 2019 | 0 | 0 | 0 | 0 |
| Average | 0 | 0 | 0 | 0 |
| | **Charter Mode** | | | |
| 2015 | 0 | 0 | 0 | 0 |
| 2016 | 2,039 | 5,332 | 0 | 7,371 |
| 2017 | 766 | 3,936 | 0 | 4,702 |
| 2018 | 2,980 | 3,847 | 0 | 6,827 |
| 2019 | 3,224 | 3,436 | 0 | 6,660 |
| Average | 1,802 | 3,310 | 0 | 5,112 |
| | **Private/Rental Mode** | | | |
| 2015 | 5,790 | 4,744 | 0 | 10,533 |
| 2016 | 40,517 | 74,716 | 0 | 115,233 |
| 2017 | 1,233 | 14,306 | 0 | 15,539 |
| 2018 | 26,222 | 188,247 | 0 | 214,469 |
| 2019 | 11,552 | 76,475 | 0 | 88,027 |
| Average | 17,063 | 71,698 | 0 | 88,760 |
| | **All Modes** | | | |
| 2015 | 5,790 | 4,744 | 0 | 10,534 |
| 2016 | 42,556 | 80,048 | 0 | 122,604 |
| 2017 | 1,999 | 18,242 | 0 | 20,241 |
| 2018 | 29,202 | 192,094 | 0 | 221,296 |
| 2019 | 14,776 | 79,911 | 0 | 94,687 |
| Average | 18,865 | 75,008 | 0 | 93,872 |

Source: MRIP database, SERO, NMFS (December, 2020).
*These estimates are based on the MRIP FES. Directed effort estimates that are calibrated to the new MRIP mail-based FES may be greater than non-calibrated estimates presented elsewhere.
Note 1: MRIP estimates for Louisiana are not available after 2013. The Louisiana Department of Wildlife and Fisheries did collect target effort data beginning in 2016; however, that data is not currently calibrated with the MRIP data and therefore is not useful for direct comparison. NMFS expects there would be few if any target trips for gray triggerfish in that part of the Gulf.
Note 2: Texas and headboat information is unavailable.

Similar analysis of recreational effort is not possible for the headboat mode because headboat data are not collected at the angler level. Estimates of effort by the headboat mode are provided

in terms of angler days, or the total number of standardized full-day angler trips.[19] Headboat angler days were fairly stable across the Gulf states from 2015 through 2019 (Table 3.3.2.2). There was, however, a downward trend in reported angler days in Florida from 2016 on. On average (2015 through 2019), 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 3.3.2.2). 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 (2015 through 2019) (Table 3.3.2.3).

**Table 3.3.2.2**. Gulf headboat angler days and percent distribution by state (2015 through 2019).

| | Angler Days | | | | Percent Distribution | | | |
|---|---|---|---|---|---|---|---|---|
| | **FL** | **AL** | **MS-LA**** | **TX** | **FL** | **AL** | **MS-LA** | **TX** |
| **2015** | 176,375 | 18,008 | 3,587 | 55,135 | 69.7% | 7.1% | 1.4% | 21.8% |
| **2016** | 183,147 | 16,831 | 2,955 | 54,083 | 71.3% | 6.5% | 1.1% | 21.0% |
| **2017** | 178,816 | 17,841 | 3,189 | 51,575 | 71.1% | 7.1% | 1.3% | 20.5% |
| **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% |
| **Average** | 174,380 | 18,228 | 3,120 | 53,082 | 70.1% | 7.3% | 1.3% | 21.3% |

Source: NMFS SRHS (February, 2020).
*Headboat data from Mississippi and Louisiana are combined for confidentiality purposes.

**Table 3.3.2.3**. Gulf headboat angler days and percent distribution by month (2015 – 2019).

| | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Headboat Angler Days** | | | | | | | | | | | |
| **2015** | 9,444 | 10,594 | 22,827 | 20,684 | 20,973 | 44,731 | 45,192 | 26,637 | 15,114 | 17,246 | 9,757 | 9,906 |
| **2016** | 7,954 | 13,233 | 21,829 | 18,691 | 21,693 | 50,333 | 49,881 | 21,775 | 13,596 | 15,827 | 11,823 | 10,381 |
| **2017** | 8,998 | 14,007 | 21,032 | 19,383 | 19,186 | 47,673 | 54,028 | 22,984 | 10,289 | 11,054 | 11,299 | 11,488 |
| **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 |
| **Avg** | 6,850 | 12,869 | 21,649 | 18,528 | 19,400 | 48,607 | 50,000 | 24,085 | 12,721 | 13,689 | 10,290 | 10,120 |
| | **Percent Distribution** | | | | | | | | | | | |
| **2015** | 3.7% | 4.2% | 9.0% | 8.2% | 8.3% | 17.7% | 17.9% | 10.5% | 6.0% | 6.8% | 3.9% | 3.9% |
| **2016** | 3.1% | 5.1% | 8.5% | 7.3% | 8.4% | 19.6% | 19.4% | 8.5% | 5.3% | 6.2% | 4.6% | 4.0% |
| **2017** | 3.6% | 5.6% | 8.4% | 7.7% | 7.6% | 19.0% | 21.5% | 9.1% | 4.1% | 4.4% | 4.5% | 4.6% |
| **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% |
| **Avg** | 2.7% | 5.2% | 8.7% | 7.4% | 7.8% | 19.5% | 20.1% | 9.7% | 5.1% | 5.5% | 4.1% | 4.1% |

Source: NMFS SRHS (February, 2020).

[19] Headboat trip categories include half-, three-quarter-, full-, and 2-day trips. A full-day trip equals one angler day, a half-day trip equals .5 angler days, etc. Angler days are not standardized to an hourly measure of effort and actual trip durations may vary within each category.

**Economic Value**

Participation, effort, and harvest are indicators of the value of saltwater recreational fishing. However, a more specific indicator of value is the satisfaction that anglers experience over and above their costs of fishing. The monetary value of this satisfaction is referred to as consumer surplus (CS). The value or benefit derived from the recreational experience is dependent on several quality determinants, which include fish size, catch success rate, and the number of fish kept. These variables help determine the value of a fishing trip and influence total demand for recreational fishing trips.

Haab et al. (2012) estimated the CS for catching and keeping one additional snapper (based on catch data for a composite group of snappers and similar species, including gray triggerfish) in the Southeastern U.S. using four separate econometric modeling techniques. Of the four models, the finite mixture model, which takes into account variation in the preferences of anglers, produced the lowest root mean square error. The CS estimate for snapper (a reasonable proxy for gray triggerfish) from the finite mixture model was $12.95 (2019 dollars); however, the other logit-based models from the study produced CS estimates for snapper that ranged from $12.95 (2019 dollars) to $35.97. [20]

The foregoing estimates of economic value should not be confused with economic impacts associated with recreational fishing expenditures. Although expenditures for a specific good or service may represent a proxy or lower bound of value (a person would not logically pay more for something than it was worth to them), they do not represent the net value (benefits minus cost), nor the change in value associated with a change in the fishing experience.

With regard to for-hire businesses, economic value can be measured by producer surplus (PS) per passenger trip (the amount of money that a vessel owner earns in excess of the cost of providing the trip). Estimates of the PS per for-hire passenger trip are not available. Instead, trip net revenue (TNR), which is the return used to pay all labor wages, returns to capital, and owner profits, is used as a proxy for PS. 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 $164 (2019 dollars) and the estimated CFpA value for an average Gulf headboat angler trip is $54 (Souza and Liese 2019). Estimates of CFpA for a gray triggerfish target trip are not available.

According to Savolainen et al. (2012), the average charter vessel operating in the Gulf is estimated to receive approximately $90,000 (2019 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 $272,000 (2019 dollars) in gross revenue and $79,000 in net income annually.

[20] Excludes red snapper which Haab et al. (2012) modeled separately and which had an estimated willingness to pay of $46.12 to $145.45 (2019 dollars).

**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 gray triggerfish in the Gulf were calculated using average trip-level impact coefficients derived from the 2016 Fisheries Economics of the U.S. report (NMFS 2018) and underlying data provided by NOAA Office of Science and Technology. Economic impact estimates in 2016 dollars were adjusted to 2019 dollars using the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

Business activity (economic impacts) for the recreational sector is characterized in the form of jobs (full- and part-time), income impacts (wages, salaries, and self-employed income), output impacts (gross business sales), and value-added impacts (contribution to the GDP in a state or region). Estimates of the average annual economic impacts (2015-2019) resulting from Gulf gray triggerfish target trips are provided in Table 3.3.2.4. The average impact coefficients, or multipliers, used in the model are invariant to the "type" of effort and can therefore be directly used to measure the impact of other effort measures such as gray triggerfish catch trips. To calculate the multipliers from Table 3.3.2.4, simply divide the desired impact measure (sales impact, value-added impact, income impact or employment) associated with a given state and mode by the number of target trips for that state and mode.

The estimates provided in Table 3.3.2.4 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 3.3.2.4 may be considered a lower bound on the economic activity associated with those trips that targeted gray triggerfish.

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 3.3.2.4**. Estimated annual average economic impacts (2015-2019) from recreational trips that targeted Gulf gray triggerfish, by state and mode, using state-level multipliers. All monetary estimates are in 2019 dollars in thousands.

| | FL | AL | MS |
|---|---|---|---|
| | **Charter Mode** | | |
| Target Trips | 3,310 | 1,802 | 0 |
| Value Added Impacts | $1,144 | $742 | $0 |
| Sales Impacts | $1,922 | $1,349 | $0 |
| Income Impacts | $669 | $423 | $0 |
| Employment (Jobs) | 18 | 15 | 0 |
| | **Private/Rental Mode** | | |
| Target Trips | 71,698 | 17,063 | 0 |
| Value Added Impacts | $2,554 | $762 | $0 |
| Sales Impacts | $3,959 | $1,179 | $0 |
| Income Impacts | $1,340 | $297 | $0 |
| Employment (Jobs) | 37 | 11 | 0 |
| | **Shore** | | |
| Target Trips | 0 | 0 | 0 |
| Value Added Impacts | $0 | $0 | $0 |
| Sales Impacts | $0 | $0 | $0 |
| Income Impacts | $0 | $0 | $0 |
| Employment (Jobs) | 0 | 0 | 0 |
| | **All Modes** | | |
| Target Trips | 75,008 | 18,865 | 0 |
| Value Added Impacts | $3,698 | $1,504 | $0 |
| Sales Impacts | $5,880 | $2,528 | $0 |
| Income Impacts | $2,009 | $720 | $0 |
| Employment (Jobs) | 55 | 26 | 0 |

Source: Effort data from MRIP; economic impact results calculated by NMFS SERO using NMFS (2018) and underlying data provided by the NOAA Office of Science and Technology.
Note 1: MRIP estimates for Louisiana are not available after 2013. The Louisiana Department of Wildlife and Fisheries did collect target effort data beginning in 2016; however, that data is not currently calibrated with the MRIP data and therefore is not useful for direct comparison. As seen in the neighboring state of Mississippi, NMFS expects there would be few if any target trips for gray triggerfish in that part of the Gulf.
Note 2: Texas and headboat information is unavailable.

## 3.4 Description of the Social Environment

A description of the social environment is included in Reef Fish Amendment 30A (GMFMC 2008) and Reef Fish Amendment 46 (GMFMC 2017b). These documents are incorporated herein by reference. The description focuses on available landings and permit data associated with geographic and demographic data to identify communities with a strong relationship to fishing for gray triggerfish. A strong relationship is defined as having significant landings and

revenue for managed species. Thus, impacts from regulatory change are more likely to occur in places with greater landings of these species. Nevertheless, for both the commercial and recreational sectors, gray triggerfish are part of a multi-species fishing strategy rather than a directed fishery. For the recreational sector, there are many communities spread throughout the Gulf, from Florida to Texas, that serve as a launching point for trips that target reef fish species including gray triggerfish. The majority of gray triggerfish landings are recreational and occur in Alabama and the Florida Panhandle, where the species has increased in popularity, while at the same time in-season fishing closures have been occurring since the implementation of ACLs (Table 1.1.1).

### 3.4.1 Commercial Fishing

As noted, gray triggerfish are part of a multi-species fishing strategy rather than a directed fishery. Most commercially caught gray triggerfish are landed by vertical line, either bandit reel or hook-and-line, alongside other species (GMFMC 2008, 2017b). Furthermore, some commercial fishermen fish throughout the Gulf and may unload in various locations, making it difficult to identify communities that would be most affected by these regulations. Dealers who buy gray triggerfish take in multiple reef fish species, so they are not totally dependent on gray triggerfish landings. Gulf commercial landings of gray triggerfish have averaged ~59,800 lbs per year from 2015 through 2019 (Table 3.3.1.1). Depending on what percentage gray triggerfish constitutes of their total landings, the dealers may or may not be heavily impacted by any reduction in landings of gray triggerfish. It is thus difficult to isolate potential impacts on communities arising from the actions in this amendment. However, communities may be affected by changes in fishing regulations generally, and by changes to fishing for gray triggerfish, specifically, so social impacts would still be expected.

A regional quotient (RQ) measure was used to identify communities with commercial landings of gray triggerfish. The RQ measures the relative importance of a given species across all communities in the region and represents the proportional distribution of commercial landings of a particular species. This proportional measure does not provide the number of pounds or the value of the catch because the data may be confidential at the community level for many places. Rather, the RQ is calculated by dividing the total pounds (or value) of a species landed in a given community, by the total pounds (or value) for that species for all communities in the region. The measure is a way to quantify the importance of gray triggerfish to communities around the Gulf coast and suggest where impacts from management actions are more likely to be experienced. The data used for the RQ measure were assembled from the ALS, which includes commercial landings of all species from both state and federal waters and is based on dealers' reports. These data were converted to provide landings by dealers' address.

As noted in Section 3.3.1, Florida accounts for the vast majority of commercial gray triggerfish landings. Based on the RQ measure, the top 15 communities with the highest landings of gray triggerfish in 2018 are identified in Figure 3.4.1.1. Of the top five communities, four are located in the Florida Panhandle (Panama City, Destin, Pensacola, and Apalachicola) with Madeira Beach following with landings well below the others.

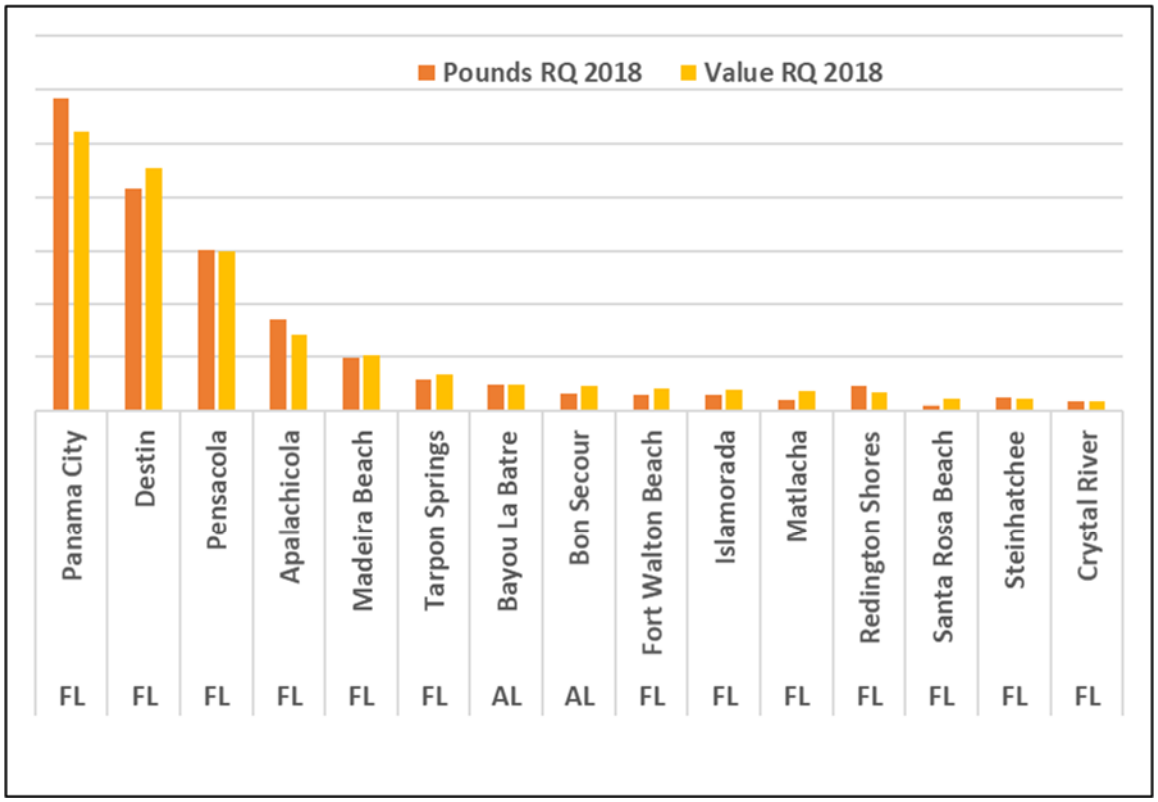


**Figure 3.4.1.1.** Top 15 communities with the greatest commercial landings of gray triggerfish in 2018. Source: NMFS ALS 2018 (based on dealer address).

A community's proportion of total landings is not static and changes over time. As noted in Reef Fish Amendment 46 (GMFMC 2017b), Florida's Panhandle communities have ranked highest for commercial gray triggerfish landings over time with their 5-year average landings higher than other areas of the Gulf and they remain so as depicted in Figure 3.4.1.1.

Figure 3.4.1.2 is an overall measure of a community's commercial fishing engagement as measured by engagement and reliance indices developed to identify those communities most involved in fishing. Most communities in Figure 3.4.1.2 are considered to be highly or moderately engaged in commercial fishing as many are at or above 1 standard deviation of the mean factor score. Fort Walton Beach, Matlacha and Redington Shores show the least amount of engagement in commercial fishing overall. Several communities are highly reliant, with communities like Bayou La Batre, Bon Secour, Apalachicola, Crystal River and Steinhatchee exhibiting fairly high reliance with moderate to high engagement. Data were not available for the community of Santa Rosa Beach.

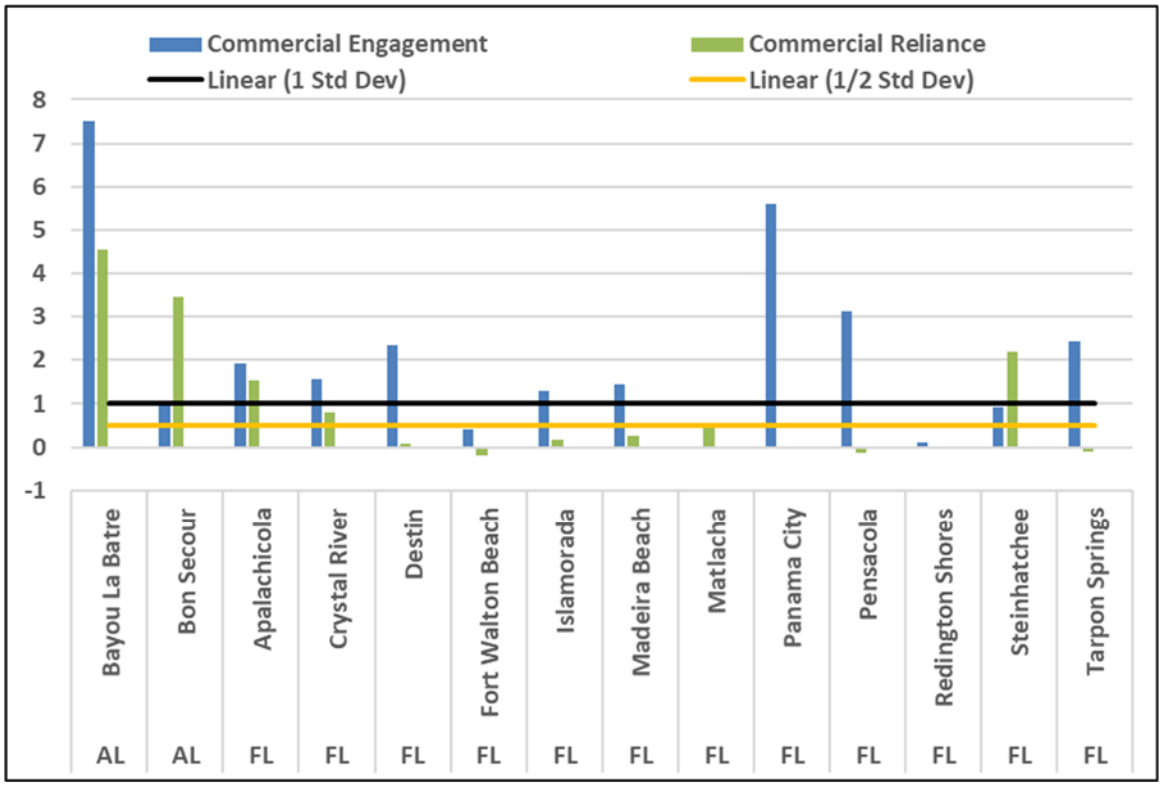


**Figure 3.4.1.2**. Commercial fishing engagement and reliance for gray triggerfish communities for 2018.

Source: Social Indicators Database, NOAA Fisheries, NMFS, SERO (accessed 12/29/20).

## 3.4.2 Recreational Fishing

Gray triggerfish landings for the recreational sector are not available by community. This makes it difficult to identify communities as dependent or reliant on recreational fishing for gray triggerfish. Furthermore, gray triggerfish is generally part of a multi-species fishing activity making it difficult to isolate recreational dependence or reliance on gray triggerfish separately from other reef fish species, although it is a prized fish when caught, especially in the Alabama area. Gulf recreational landings of gray triggerfish have averaged ~273,992 lbs per year from 2015 through 2019, with a range of 67,245 lbs to 491,514 lbs (Table 1.1.1). The fishing season was closed on February 7 in 2015, and was only one day long in 2017. The in-season closures that have occurred each year since 2012 have coincided with its growing popularity.

While there are no landings data at the community level for the recreational sector, Table 3.4.2.1 provides a listing of the top 25 communities based upon the number of charter vessel/headboat (for-hire) permits for reef fish. This is a crude measure of the reliance upon recreational reef fish fishing, is general in nature, and not specific to gray triggerfish. Ideally, additional variables quantifying the importance of recreational fishing to a community would be included, such as the amount of recreational landings in a community by species, availability of recreational fishing related businesses and infrastructure, etc.; however, these data are not available at this time. The communities of Destin, FL and Orange Beach, AL have the most for-hire reef fish permits, outdistancing other communities by far. It is likely that these two communities would have more

gray triggerfish landings as they are located in the areas where much of the recreational landings occur for this species.

**Table 3.4.2.1.** Number of reef fish charter permits by community

| State | Home Port City | Number of Permits |
|---|---|---|
| FL | DESTIN | 91 |
| AL | ORANGE BEACH | 84 |
| LA | VENICE | 42 |
| FL | NAPLES | 39 |
| FL | PANAMA CITY | 35 |
| TX | GALVESTON | 35 |
| FL | KEY WEST | 33 |
| TX | FREEPORT | 30 |
| TX | PORT ARANSAS | 28 |
| FL | PANAMA CITY BEACH | 26 |
| FL | CLEARWATER | 24 |
| FL | PENSACOLA | 23 |
| FL | SAINT PETERSBURG | 21 |
| FL | SARASOTA | 19 |
| AL | DAUPHIN ISLAND | 18 |
| FL | CRYSTAL RIVER | 17 |
| FL | MADEIRA BEACH | 15 |
| FL | FORT MYERS BEACH | 14 |
| MS | BILOXI | 14 |
| FL | MARCO ISLAND | 13 |
| FL | TARPON SPRINGS | 13 |
| FL | VENICE | 12 |
| LA | GRAND ISLE | 12 |
| TX | MATAGORDA | 12 |
| FL | FORT MYERS | 11 |

Source: SERO Permits 2020 (accessed 12/29/20).

At this time, it is not possible to examine the intensity of recreational fishing activity at the community level for a specific species, i.e., gray triggerfish. However, it is likely that those communities that have a higher rank in terms of for-hire activity and have a dynamic commercial fishery for gray triggerfish will likely have a higher engagement in recreational fishing for gray triggerfish. Nevertheless, it cannot be assumed that the proportion of commercial gray triggerfish landings among other species in a community would be similar to its proportion among recreational landings within the same community because of differences in fishing practices and preferences among sectors. Yet, an examination of where commercial and recreational landings are the greatest, and where these locations overlap could suggest areas of

greater recreational dependence and reliance on the gray triggerfish resource, and thus, where effects would most likely be experienced.

Figure 3.4.2.1 is an overall measure of a community's recreational fishing engagement as measured by engagement and reliance indices developed to identify those communities most involved in fishing. The communities in Figure 3.4.2.1 are considered to be highly or moderately engaged in recreational fishing as all are at or above 1 standard deviation of the mean factor score. Dauphin Island, Crystal River, Orange Beach, Destin, Venice and Port Aransas are also highly reliant on recreational fishing as they exceed the 1 standard deviation for that measure also.

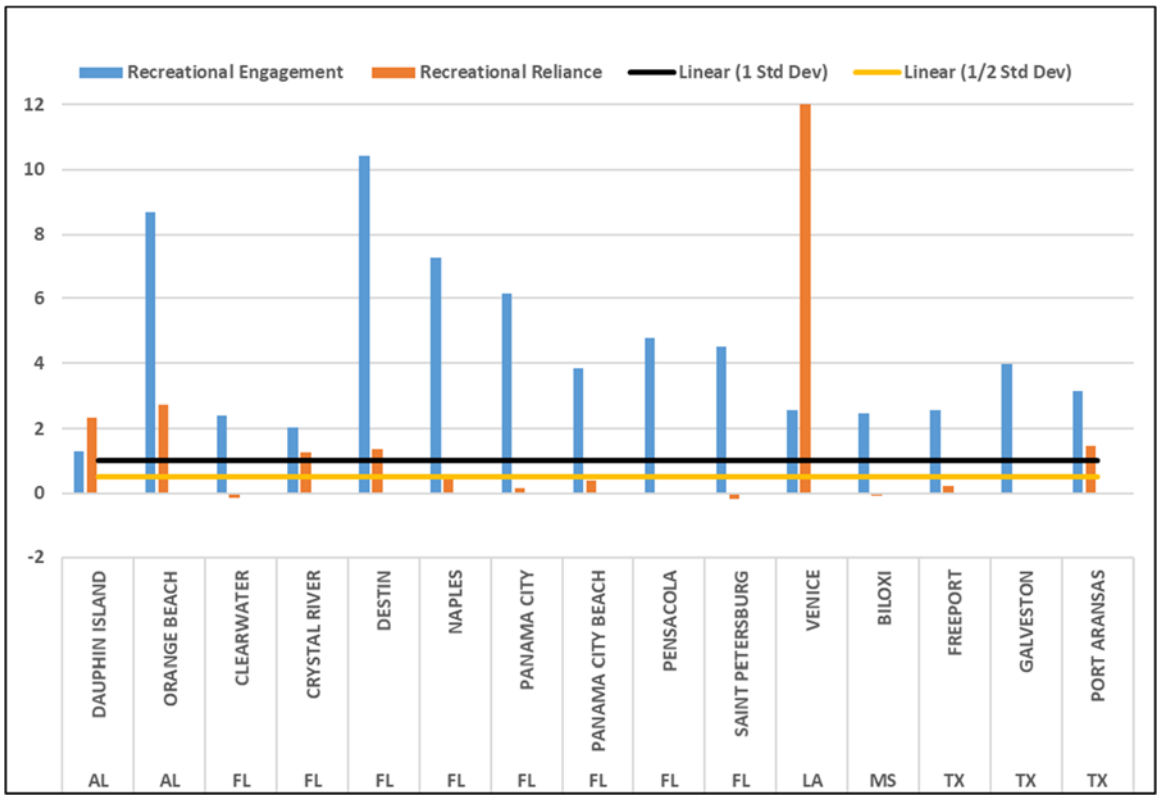


**Figure 3.4.2.1**. Recreational fishing engagement and reliance for gray triggerfish communities for 2018.

Source: Social Indicators Database, NOAA Fisheries, NMFS, SERO (accessed 12/29/20).

## 3.4.3 Environmental Justice Considerations

Executive Order (E.O.) 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. The main focus of E.O. 12898 is to consider "the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-

income populations in the United States and its territories…" This executive order is generally referred to as environmental justice (EJ).

### 3.4.4 Community Social Vulnerability Indices

In order to assess whether a community may be experiencing EJ issues, a suite of indices created to examine the social vulnerability of coastal communities (Jepson and Colburn 2013; Jacob et al. 2013) is presented in Figures 3.4.4.1 The three indices are poverty, population composition, and personal disruption. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and children under the age of 5, disruptions such as higher separation rates, higher crime rates, and unemployment are all signs of vulnerable populations. These indicators are closely aligned to previously used measures of EJ which used thresholds for the number of minorities and those in poverty, but are more comprehensive in their assessment. Again, those communities that exceed the thresholds would be expected to exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change. It should be noted that some communities may not appear in these figures as census data are not available to create the indices.

Of the communities in Figure 3.4.4.1., most do not exceed thresholds for any indices and therefore would not be considered to be experiencing any vulnerabilities. The communities of Bayou La Batre, Alabama and Freeport, Texas seem to exhibit the greatest vulnerabilities with all three indices above or nearly above both thresholds in Figure 3.4.4.1. The communities of Panama City, Venice, Biloxi and Galveston are above the ½ standard deviation threshold for both personal disruption and poverty. Those communities with the highest vulnerabilities would be expected to have a more difficult time adapting to any negative social impacts as a result of this action. This is not to say that fishermen in these communities will be impacted negatively and as a result will have difficulties. These results posit the possibility that challenges may exist given the overall vulnerabilities that are present within a community.

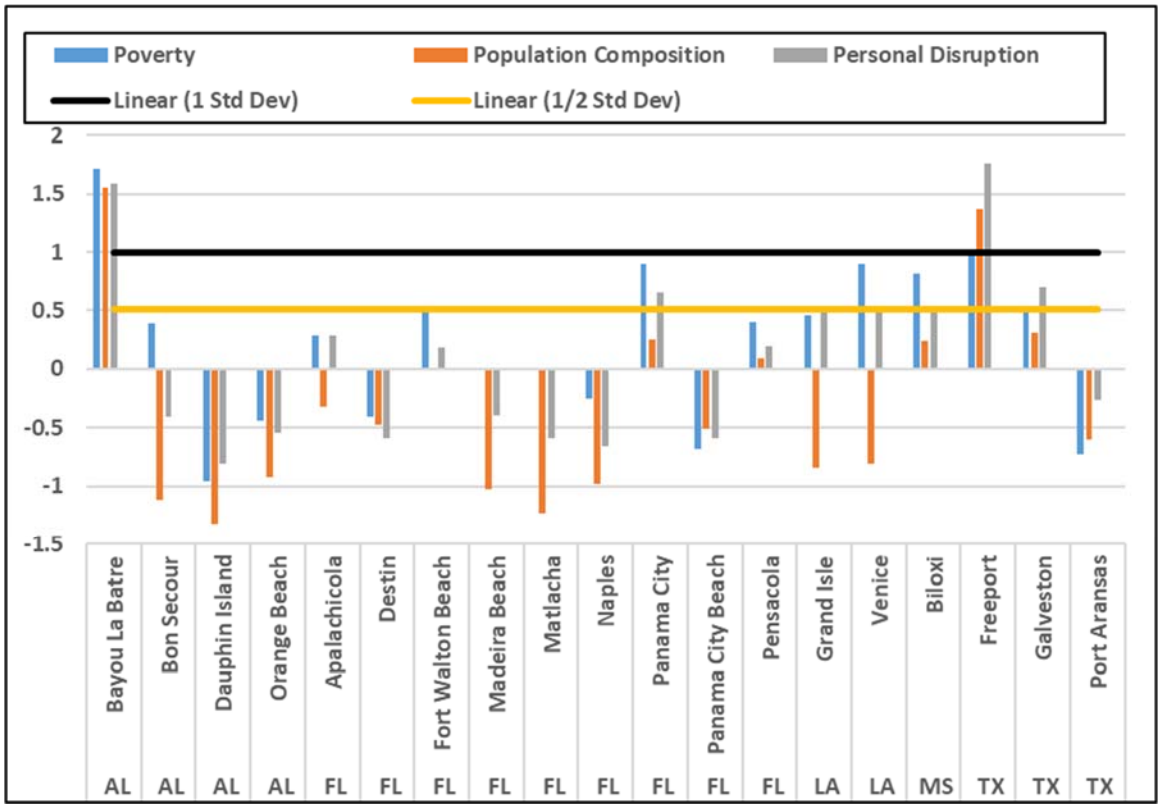


**Figure 3.4.4.1.** Social vulnerability indices for selected Gulf gray triggerfish fishing communities.
Source: NOAA Fisheries Office of Science and Technology. 2020. NOAA Fisheries Community Social Vulnerability Indicators (CSVIs). Version 3 (Last updated December 21, 2020).

Information on race, ethnicity, and income status for groups at the different participation levels (private anglers, for-hire captains, crew, and customers, and employees of recreational fishing businesses, etc.) is not available at this time. Recreational and commercial fishermen and associated businesses and communities along the coast may be affected by the actions in this amendment. The actions in this amendment would not affect individuals differently based on race, ethnicity, or income status. Thus, disproportionate impacts to EJ populations are not expected to result from any of the actions in this amendment. Nevertheless, the lack of impacts on EJ populations cannot be assumed. Finally, there are no known claims for customary usage or subsistence consumption of gray triggerfish by any population including tribes or indigenous groups.

## 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.*), which was enacted in 1976 as the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens 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 and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring management measures are consistent with the Magnuson-Stevens Act and with other applicable laws summarized in Appendix C. In most cases, the Secretary has delegated this authority to NMFS.

The Council is responsible for fishery resources in federal waters of the Gulf. For reef fish, these waters extend 9 to 200 miles offshore from the seaward boundaries of Alabama, Florida, Louisiana, Mississippi, and Texas, as those boundaries have been defined by law. The length of the Gulf coastline is approximately 1,631 miles. Florida has the longest coastline extending 770 miles along its Gulf coast, followed by Louisiana (397 miles), Texas (361 miles), Alabama (53 miles), and Mississippi (44 miles).

The Council consists of 17 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 Gulf 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 3.5.2.1).

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

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

# CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

## 4.1 Action 1: Modify the Gray Triggerfish ABC, ACLs, and ACTs

**Alternative 1:** No Action. Retain the acceptable biological catch (ABC), annual catch limits (ACL), and annual catch targets (ACT) for gray triggerfish as implemented in 2018 by Reef Fish Amendment 46.

| Year | OFL | ABC | Recreational ACL | Recreational ACT | Commercial ACL | Commercial ACT |
|---|---|---|---|---|---|---|
| **2019+** | 1,220,000 | 305,300 | 241,200 | 217,100 | 64,100 | 60,900 |

Note: Values are in pounds whole weight. Units are in MRIP-CHTS. The OFL reflects the SSC's January 2016 recommendation.

**Alternative 2:** Modify the ABC, ACLs, and ACTs for gray triggerfish based on the results of the 2020 interim analysis, the recommendations of the Council's SSC, and Reef Fish Advisory Panel (Reef Fish AP). Apply the ACL/ACT Control Rule to determine the buffer between the ACL and ACT for the recreational and commercial sectors, respectively.

| Year | OFL | ABC | Recreational ACL | Recreational ACT | Commercial ACL | Commercial ACT |
|---|---|---|---|---|---|---|
| **2021+** | 1,220,000 | 456,900 | 360,951 | 274,323 | 95,949 | 88,273 |

Note: Values are in pounds whole weight. Units are in MRIP-CHTS. The OFL reflects the SSC's January 2016 recommendation.

### 4.1.1 Effects on the Physical Environment

Effects on the physical environment from changes in fishing effort or harvest levels are associated with fishing gear contacting bottom habitat and anchoring. In general, gray triggerfish are opportunistically harvested by fishermen targeting other reef fish species (e.g., snappers and groupers). Recreational fishing for reef fish species is commonly conducted with vertical-line gear and commercial fishing is commonly conducted using vertical-line gear and less frequently with bottom longlines and spears. All three of these gear types have the potential to snag and entangle bottom structures (Barnette 2001). Potential bottom substrate damage can also occur when deploying a vessel's anchor. Additionally, preferred fishing sites, like reefs, are targeted and revisited multiple times by fishing vessels, which increases the potential for prolonged effects to the physical environment (Bohnsack 2000).

**Alternative 1** (No Action) would retain the ABC, ACLs, and ACTs for gray triggerfish as implemented in 2018 by the final rule for Amendment 46 to the Fishery Management Plan (FMP) for Reef Fish Resources in the Gulf of Mexico (Reef Fish FMP). Therefore, no additional effects on the physical environment would be expected. Commercial and recreational catch levels would remain the same, with annual seasonal closures to protect the stock from overexploitation. Sector allocations also remain the same (79% recreational, 21% commercial) making it unlikely that there would be any large shift in current fishing effort for either the

recreational or commercial sectors. Both fishing sectors have experienced periodic overages and payback accountability measures (AM), although the recreational sector has experienced more overages than the commercial sector.

**Alternative 2** may affect the physical environment by altering harvest levels. Under **Alternative 2**, the overfishing limit (OFL) would remain the same as **Alternative 1**, but the ABC would increase from 305,300 pounds whole weight (lbs ww) to 456,900 lbs ww based on the Scientific and Statistical Committee's (SSC) recommendation and the 2020 gray triggerfish interim analysis. There would also be an increase in the respective sector ACLs and ACTs. Generally, an increase in fishing effort corresponds to an increase in harvest levels. This, in turn, could lead to more gear interactions with bottom habitats (Barnette 2001). More gear interactions with the bottom could potentially have an adverse effect on the physical environment in the form of gear entanglements and damage to bottom habitat.

### 4.1.2 Effects on the Biological Environment

Similar to Section 4.1.1, it is not anticipated that **Alternative 1** (No Action) would result in effects to the biological environment as the OFL, ABC, ACLs and ACTs would remain the same and harvest levels and effort are not expected to deviate much from their current levels. Recreational and commercial sector ACLs have often been met or exceeded, although the recreational sector has experienced more overages than the commercial sector. Under **Alternative 1,** the gray triggerfish stock remains on target to meet the rebuilding plan timeline set to rebuild the stock by 2025. However, the catch limits in **Alternative 1** do not reflect the Southeast Fisheries Science Center and Council's SSC's recent ABC recommendation based on the 2020 gray triggerfish interim analysis, or the Reef Fish Advisory Panel's (AP) request to set the total ACL equal to the ABC based on that interim analysis.

**Alternative 2** would likely result in increased fishing effort and harvest levels as this alternative increases the gray triggerfish catch limits. The ABC would increase by 151,600 lbs ww, yielding higher recreational and commercial sector ACLs. This could result in adverse effects to the biological environment only if the increased catch limits are exceeded; else, so long as the catch limits are not exceeded, no adverse effects to the biological environment are expected. **Alternative 2** also increases both sectors' buffers between their respective ACLs and ACTs. It applies the Council's ACL/ACT Control Rule to calculate a new buffer of 24% between the recreational ACL and ACT, and an 8% buffer between the commercial ACL and ACT. Increasing these buffers could help constrain landings below the respective sector ACLs. An increase in fishing effort to catch gray triggerfish could also affect other reef fish species, as per-trip effort in the reef fish fishery is not usually constrained to a single species. It is also difficult to determine how an increase in catch limits would affect progress towards the stock rebuilding target as the recent 2020 interim analysis approach does not provide biomass information. However, index of abundance trends indicate that it is likely that gray triggerfish biomass has increased in recent years. This additional biomass is expected by the SSC to support additional removals. Modifying the catch levels through this action is not expected to change how the reef fish fishery is prosecuted or result in any impacts beyond those described in Section 3.2.

### 4.1.3 Effects on the Economic Environment

**Alternative 1** (No Action) would not modify the current reference points (OFL and ABC) or the commercial and recreational ACLs and ACTs for gray triggerfish. Therefore, **Alternative 1** would not be expected to change fishing practices or recreational and commercial harvests of gray triggerfish and would not be expected to result in economic effects. However, **Alternative 1** would not be consistent with the SSC's latest recommendations and would unduly restrict recreational and commercial gray triggerfish harvests, thereby resulting in forgone economic benefits.

**Alternative 2** would retain the same gray triggerfish OFL as **Alternative 1**, but would increase the ABC and the recreational and commercial ACLs and ACTs. For the commercial sector, economic effects that would be expected to result from the proposed catch limit and catch target increases can be measured by estimating changes in ex-vessel value. Changes in ex-vessel values provided were based on the commercial ACT increase relative to **Alternative 1** and on a 2015-2019 average ex-vessel price of $2.05 ($2019) per pound of gray triggerfish. The average ex-vessel price is derived from landings and revenues provided in Table 3.3.1.1. Commercial ACTs and ex-vessel values for each alternative and differences relative to **Alternative 1** (No Action) are provided in Table 4.1.3.1.

**Table 4.1.3.1.** Gray Triggerfish Commercial ACT and ex-vessel value ($2019) by alternative

| | ACT | Ex-Vessel Value |
|---|---|---|
| **Alternative 1** | 60,900 | $124,845.00 |
| **Alternative 2** | 88,273 | $180,959.65 |
| **Difference Alternative 2 – Alternative 1** | 27,373 | $56,114.65 |

The commercial ACT proposed in **Alternative 2** would correspond to a 27,373 lb increase in ACT, relative to **Alternative 1**. Therefore, under **Alternative 2**, commercial fishermen would potentially benefit from an increase in ex-vessel value of $56,115 (in $2019) annually. It is assumed that the entirety of the increase in the commercial gray triggerfish ACT would be harvested. If commercial landings fall short of the new ACT, economic effects expected to result from **Alternative 2** would be reduced to reflect the lower amounts harvested.

For the recreational sector, economic effects expected to result from **Alternative 2** were measured in changes in economic value, i.e., changes in consumer surplus (CS) for anglers. CS per additional fish kept during a trip is defined as the amount of money an angler would be willing to pay for a fish in excess of the cost to harvest the fish. The expected changes in CS were based on the estimated CS per gray triggerfish and on the change in the recreational ACT relative to **Alternative 1**, expressed in number of fish. Based on Amendment 46 to the Reef Fish FMP (GMFMC 2017b), an average weight of 2.49 lbs per recreational gray triggerfish landed is used. Estimates of the CS per fish for most individual species are not available, and this includes

gray triggerfish. CS estimates for snapper, which is a reasonable proxy for gray triggerfish, are used in this analysis. A CS estimate of $12.95 (updated to $2019) is provided by Haab et al. (2012). This analysis does not include changes in producer surplus (PS) or net operating revenue (NOR) that would accrue to for-hire operators because private recreational anglers account for 95% of the gray triggerfish target trips (2015-2019 average in Table 3.3.2.1). **Alternative 2** would not be expected to materially alter anglers' demand for for-hire trips; therefore, any resultant effects to for-hire businesses would likely be minimal. The ACT expressed in pounds and in numbers of fish, and economic values for each alternative and differences relative to **Alternative 1** (No Action) are provided in Table 4.1.3.2.

**Table 4.1.3.2.** Gray Triggerfish Recreational ACT and economic value ($2019) by alternative

| | ACT (pounds) | ACT (number of fish) | Economic Value (CS) |
|---|---|---|---|
| **Alternative 1** | 217,100 | 87,189 | $1,129,094.38 |
| **Alternative 2** | 274,323 | 110,170 | $1,426,699.94 |
| **Difference Alternative 2 – Alternative 1** | 57,223 | 22,981 | $297,605.56 |

Relative to **Alternative 1**, the recreational ACT proposed in **Alternative 2** would increase the recreational ACT by 57,223 lbs or 22,981 additional gray triggerfish. Therefore, under **Alternative 2**, recreational anglers harvesting gray triggerfish would potentially enjoy an increase in economic value estimated at $297,605 (in $2019) annually. It is expected that recreational anglers would harvest the totality of the proposed recreational gray triggerfish ACT. If recreational harvests fall below the ACT proposed in **Alternative 2**, economic effects expected to result from this alternative would be prorated accordingly.

### 4.1.4 Effects on the Social Environment

Although additional effects would not be expected from **Alternative 1** (No Action) and catch levels would remain the same, seasonal closures have occurred frequently in recent years for both sectors (Tables 1.1.2 and 1.1.3). Seasonal closures are disruptive to fishery participants, resulting in negative social effects. These negative effects have been compounded, especially for the recreational sector, as a sector's ACL is reduced to account for an ACL overage in the previous year (i.e., post-season overage adjustment).

**Alternative 2** would increase the catch levels for both sectors, which would be expected to result in positive social effects. It cannot be assumed that effort and landings would be similar to recent years, especially given the varied timing of seasonal closures for the recreational sector. For the commercial sector, the ACL under **Alternative 2** is greater than the landings for any year since 2008, except for 2011, which was prior to the establishment of ACLs through the Generic ACL/AM Amendment. Retaining the existing effort restrictions (e.g., the trip limit of 16 fish) and use of an ACT, it is likely that the commercial sector's landings would be constrained to below the commercial ACL under **Alternative 2**. For the recreational sector, the proposed ACL

under **Alternative 2** is not likely to constrain landings to below the ACL alongside existing effort restrictions without a seasonal closure. However, the increase to the ACL would be expected to extend the length of the fishing season compared to **Alternative 1**.

### 4.1.5 Effects on the Administrative Environment

Modifying annual harvest levels including the ABC, ACLs and ACTs does not typically result in substantial effects on the administrative environment. **Alternative 1** is not expected to impact the administrative environment because it would not change the current harvest levels. **Alternative 2** would result in a short-term increased burden on the administrative environment due to the establishment of new catch limits. Changing the catch limits from **Alternative 1** would increase the burden for the National Marine Fisheries Service, which would have to engage in rulemaking to implement this change in management. The administrative burden for law enforcement would go largely unchanged, as law enforcement officers would continue to monitor compliance with any established catch limits. Once these changes to catch levels are implemented, the type of regulations needed to manage the reef fish fishery would remain unchanged regardless of the choice of harvest levels. Some administrative burden is anticipated with respect to outreach as it relates to notifying stakeholders of the changes to harvest levels.

# CHAPTER 5: AGENCIES, ORGANIZATIONS AND PERSONS CONSULTED

The following have or will be consulted:

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

NOAA General Counsel
U.S. Coast Guard
Alabama Department of Conservation and Natural Resources/Marine Resources Division
Florida Fish and Wildlife Conservation Commission
Louisiana Department of Wildlife and Fisheries
Mississippi Department of Marine Resources
Texas Parks and Wildlife Department

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# APPENDIX A. ACL/ACT CONTROL RULES FOR GRAY TRIGGERFISH

| | | | | | |
|---|---|---|---|---|---|
| As of 10/07/2020 | | | | Gray Triggerfish | |
| **ACL/ACT Buffer Spreadsheet** | | | version 4.1 - April 2011 | **Sector: Recreational** | |
| sum of points | 14 | | | **Years: 2016-2019** | |
| max points | 16.0 | | Buffer between ACL and ACT (or ABC and ACL) | Unweighted | 20 |
| **Min. Buffer** | 0 | **min. buffer** | User adjustable | Weighted | **24** |
| Max Unw.Buff | 23 | max unwt. Buff | | | |
| **Max Wtd Buff** | 30 | **max wtd. buffer** | User adjustable | | |

| | Component | Element score | Element | Selection | Element result |
|---|---|---|---|---|---|
| | Stock assemblage | 0 | This ACL/ACT is for a single stock. | x | 0 |
| | | 1 | This ACL/ACT is for a stock assemblage, or an indicator species for a stock assemblage | | |
| | Ability to Constrain Catch | 0 | Catch limit has been exceeded 0 or 1 times in last 4 years | | 12 |
| | | 1 | Catch limit has been exceeded 2 or more times in last 4 years | x | |
| | | | For the year with max. overage, add 0.5 pts. For every 10 percentage points (rounded up) above ACL | 11.0 | |
| | | | Not applicable (there is no catch limit) | | |
| | | | Apply this component to recreational fisheries, not commercial or IFQ fisheries | | |
| | | 0 | Method of absolute counting | | 2 |
| | Precision of | 1 | MRIP proportional standard error (PSE) <= 20 | | |
| | Landings Data | 2 | MRIP proportional standard error (PSE) > 20 | x | |
| | Recreational | | Not applicable (will not be included in buffer calculation) | | |
| | | | Apply this component to commercial fisheries or any fishery under an IFQ program | | |
| | Precision of | 0 | Landings from IFQ program | | not applicable |
| | | 1 | Landings based on dealer reporting | | |
| | Landings Data | 2 | Landings based on other | | |
| | Commercial | | Not applicable (will not be included in buffer calculation) | x | |
| | Timeliness | 0 | In-season accountability measures used or fishery is under an IFQ | x | 0 |
| | | 1 | In-season accountability measures not used | | |
| | | | | Sum | 14 |

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

**Figure A1.** Council's ACL/ACT Control Rule for the recreational gray triggerfish sector using years 2016 – 2019.

| ACL/ACT Buffer Spreadsheet | | | version 4.1 - April 2011 | Sector: Commercial | |
|---|---|---|---|---|---|
| sum of points | 1.5 | | | Years: 2016-2019 | |
| max points | 5.5 | | Buffer between ACL and ACT (or ABC and ACL) | Unweighted | 6 |
| **Min. Buffer** | **0** | **min. buffer** | User adjustable | Weighted | **8** |
| Max Unw.Buff | 23 | max unwt. Buff | | | |
| **Max Wtd Buff** | **30** | **max wtd. buffer** | User adjustable | | |

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

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

**Figure A2.** Council's ACL/ACT Control Rule for the commercial gray triggerfish sector using years 2016 – 2019.

# APPENDIX B. CHANGES TO RECREATIONAL DATA COLLECTION

*Changes to the Recreational Data Collection Survey*

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

MRFSS included both offsite telephone surveys and onsite interviews at marinas and other points where recreational anglers fish. In 2008, the Marine Recreational Information Program (MRIP) was established to replace MRFSS to meet increasing demand for more precise, accurate, and timely recreational catch estimates. After the National Academies of Sciences identified potential sources of bias in the sampling process, catch survey protocols were revised. This led to a new design for the APAIS that was certified and subsequently implemented in 2013 to measure recreational catch on the Atlantic and Gulf coasts. This significantly improved how intercepts were conducted. This new design addressed concerns regarding the validity of the survey approach, specifically that trips recorded during a given time period were representative of trips for a full day (Foster et al. 2018). The more complete temporal coverage with the new survey design provided for consistent increases or decreases in APAIS angler catch rate statistics, which are used in stock assessments and management, for at least some species (NOAA Fisheries 2019).

MRIP is a more scientifically sound methodology for estimating catch because it reduces some sources of potential bias as compared to MRFSS resulting in more accurate catch estimates. Specifically, CHTS was improved to better estimate private angling effort. Instead of random telephone calls, MRIP-CHTS used targeted calls to anglers registered with a federal or state saltwater fishing registry. Subsequently, MRIP transitioned from the CHTS to a new mail-based Fishing Effort Survey, (FES) beginning in 2015, and in 2018, replaced the CHTS. Both survey methods collect data needed to estimate marine recreational fishing effort (number of fishing trips) by shore and private/rental boat anglers on the Atlantic and Gulf coasts. The CHTS used random-digit dialing of homes in coastal counties to contact anglers. The new mail-based FES uses angler license and registration information as one way to identify and contact anglers (supplemented with data from the U.S. Postal Service, which includes virtually all U.S. households). Because the FES and CHTS are so different, NMFS conducted side-by side testing of the two methods from 2015 to 2018 and developed calibration procedures to convert the historical catch estimates (MRFSS, MRIP-CHTS, MRIP-APAIS [collectively MRFSS]) into MRIP-FES. In general, landings estimates are higher using the MRIP-FES as compared to the

MRFSS estimates. This is because the FES is designed to more accurately measure fishing activity than the CHTS, not because there was a sudden rise in fishing effort. NMFS developed a calibration model to adjust historic effort estimates so that they can be accurately compared to new estimates from the FES. The new effort estimates alone do not lead to definitive conclusions about stock size or status in the past or currently. NMFS determined that the MRIP-FES data, when fully calibrated to ensure comparability among years and across states, produced the best available data for use in stock assessments and management (NOAA Fisheries 2019).

# APPENDIX C. APPENDIX C. OTHER APPLICABLE LAW

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for management of stocks included in fishery management plans (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. Proposed and final rules will be published before implementing the action in this framework.

## Coastal Zone Management Act

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

Upon submission to the Secretary of Commerce, NMFS will determine if this framework is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. Their determination will then be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these states.

## Data Quality Act

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

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

Scientific information and data are key components of FMPs and amendments and the use of best available information is the second national standard under the Magnuson-Stevens Act. To be consistent with the Magnuson-Stevens Act, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data will also undergo quality control prior to being used by the agency and a pre-dissemination review.

## National Historic Preservation Act

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

Historical research indicates that over 2,000 ships have sunk on the Federal Outer Continental Shelf between 1625 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.[21]

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

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

Register of Historic Places.[22] Fishing activity already occurs in the vicinity of this site, but the proposed action would have no additional adverse impacts on listed historic resources, nor would they alter any regulations intended to protect them.

## Executive Orders (E.O.)

### E.O. 12630: Takings

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

### E.O. 12962: Recreational Fisheries

This E.O. requires federal agencies, in cooperation with states and tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects. Additionally, it establishes a seven-member National Recreational Fisheries Coordination Council (NRFCC) responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The NRFCC also is responsible for developing, in cooperation with federal agencies, States and Tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the E.O. requires NMFS and the United States Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

### E.O. 13089: Coral Reef Protection

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

[22] Further information can be found at http://www.boem.gov/Environmental-Stewardship/Archaeology/Shipwrecks.aspx.

Regulations are already in place to limit or reduce habitat impacts within the Flower Garden Banks National Marine Sanctuary. Additionally, NMFS approved and implemented Generic Amendment 3 for Essential Fish Habitat (GMFMC 2005), which established additional habitat areas of particular concern (HAPCs) and gear restrictions to protect corals throughout the Gulf. There are no implications to coral reefs by the actions proposed in this amendment.

### E.O. 13132: Federalism

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

No Federalism issues were identified relative to the action to modify the management of the commercial harvest of greater amberjack. Therefore, consultation with state officials under Executive Order 12612 was not necessary.

### 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.