Shrimp Permit Moratorium

Draft Amendment 19

to the Fishery Management Plan for the Shrimp Fishery of the Gulf of America, U.S. Waters

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Responsible Agencies and Contact Persons

Gulf Fishery Management Council (Council)
4107 W. Spruce Street, Suite 200
Tampa, Florida 33607
Matthew Freeman (matt.freeman@gulfcouncil.org)

813-348-1630
813-348-1711 (fax)
gulfcouncil@gulfcouncil.org
http://www.gulfcouncil.org

National Marine Fisheries Service (Lead Agency)
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701
Rich Malinowski (rich.malinowski@noaa.gov)

727-824-5305
727-824-5308 (fax)
http://sero.nmfs.noaa.gov

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ABBREVIATIONS USED IN THIS DOCUMENT

ACL	annual catch limit
AM	accountability measures
BRD	bycatch reduction device
BiOp	biological opinion
CFR	code of federal regulations
CZMA	Coastal Zone Management Act
Council	Gulf Council
DPS	distinct population segments
E.O.	Executive Order
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	Essential Fish Habitat
EIS	economic impact statement
ELB	electronic logbook
ESA	Endangered Species Act
FL	fork length
FMP	Fishery Management Plan
GDP	gross domestic product
Gulf	Gulf of America (Formerly Gulf of Mexico)
HAPC	habitat areas of particular concern
MMPA	Marine Mammals Protection Act
MSY	maximum sustainable yield
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OY	optimum yield
PAH	polycyclic aromatic hydrocarbons
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SEIS	Supplemental Environmental Impact Statement
SERO	Southeast Regional Office
SPGM	Gulf of Mexico shrimp moratorium
Secretary	Secretary of Commerce
TED	turtle excluder device
lw	landed weight
mp	million pounds
ww	whole weight

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CHAPTER 1. INTRODUCTION

1.1 Background

The Gulf Council (Council) and the National Marine Fisheries Service (NMFS) began managing the shrimp fishery in the Gulf of America (Gulf) in 1981. The Fishery Management Plan (FMP) for the Shrimp Fishery of the Gulf, U.S. Waters (Shrimp FMP) includes four species: brown shrimp, *Farfantepenaeus aztecus*; pink shrimp, *Farfantepenaeus duorarum*; white shrimp, *Litopenaeus setiferus*; and royal red shrimp, *Pleoticus robustus*.

In 2001, the Council established a federal commercial permit for all vessels harvesting shrimp from federal waters of the Gulf through Amendment 11 to the Shrimp FMP (GMFMC 2001). Approximately 2,951 vessels had been issued these permits by 2006. After the establishment of the permit, the shrimp fishery experienced economic losses, primarily because of high fuel costs and reduced shrimp prices caused by competition from imports. These economic losses resulted in the exodus of vessels from the fishery, and consequently, reduction of fishing effort. The Council determined that the number of vessels in the offshore shrimp fleet would likely decline to a point where the fishery again became profitable for the remaining participants, and new vessels might want to enter the fishery. That additional effort could negate, or at least lessen, profitability for the fleet as a whole. Consequently, the Council established a 10-year moratorium on the issuance of new federal commercial shrimp vessel permits through Amendment 13 to the Shrimp FMP (GMFMC 2005). The final rule implementing the moratorium was effective October 26, 2006; permits became effective in March 2007. The Council then reviewed the 10-year moratorium from Amendment 13 and established a 10-year continuation of the moratorium through Amendment 17A to the Shrimp FMP (GMFMC 2016). The final rule implementing the continuation of the 10-year moratorium was effective August 22, 2016, and extended the moratorium such that it would expire on October 26, 2026.

To be eligible for a commercial shrimp vessel permit under the initial moratorium, vessels must have been issued a valid permit by NMFS prior to and including December 6, 2003. An exception was made for owners who lost use of a qualified vessel, but obtained a valid commercial shrimp vessel permit for the same vessel or another vessel prior to the date of publication of the final rule. NMFS estimated 285 of the 2,951 vessels would not meet the control date; thus, the number of permitted vessels under the moratorium would be 2,666. Of those 285 ineligible vessels, 126 were inactive during 2002 (the last year of data available during the time the Council deliberated on this issue). Of the remaining 159 active vessels, only 72 operated in federal waters and were excluded under the moratorium.

Vessel owners had one year to obtain the new permit; NMFS issued 1,933 moratorium permits in that time. In 2024, 1,287 moratorium permits were valid or renewable (within one year of expiration); therefore, the number of permits has decreased by 646 since the moratorium's full conversion of permits in 2008 (Table 1.1.1). These permits have been permanently removed and are no longer available to the fishery. A permit is valid if it has been renewed; a permit is renewable for one year from its expiration. After a year with no renewal, a permit is terminated

and permanently removed from the permit pool. Only a valid permit can be used to harvest shrimp.

Table 1.1.1. Number of valid or renewable federal Gulf commercial shrimp vessel permits as of December 31 each year since implementation of the moratorium. Valid permits are those that were fishable at least one day each year.

Year	Number of Valid or Renewable Permits Each Year	Cumulative Number of Permits Lost from the Fishery	Number of Active Vessels*	% of Active Permits*
2008	1,933	N/A		
2009	1,907	26		
2010	1,723	184		
2011	1,632	91		
2012	1,582	50		
2013	1,534	48		
2014	1,501	33		
2015	1,471	30		
2016	1,454	17	1093	75%
2017	1,442	12	1102	76%
2018	1,426	16	1078	76%
2019	1,418	8	1041	73%
2020	1,400	18	995	71%
2021	1,384	16	980	71%
2022	1,360	24	948	70%
2023	1,335	25	807	60%
2024	1,287	48		

Source: NMFS Southeast Regional Office (SERO) Permits Database

*Active means landing at least one pound of shrimp each year, and shrimp landings from trip tickets may include landings in both inshore and offshore waters.

The moratorium on federal commercial shrimp permits will expire on October 26, 2026. The Council may: 1) allow the moratorium to expire and revert all federal Gulf commercial shrimp permits to open access; 2) extend the moratorium for another period of time; or 3) establish a limited access permit for federal Gulf commercial shrimp vessel moratorium permits that would not have an expiration date. Fishing permits traditionally move from open access, to a moratorium for a limited period time used to evaluate the moratorium success, before converting either to a limit access permit or back to an open access permit.

1.2 Purpose and Need

The purpose of this action is to determine if limiting access to federal permits is necessary on a temporary or permanent basis to maintain the biological, social, and economic benefits to the shrimp fishery achieved under the moratorium.

The need is to protect federally managed Gulf shrimp stocks while promoting catch efficiency, economic efficiency and stability, and obtain the best available information with which to manage the fishery.

1.3 History of Management

The **Shrimp Fishery Management Plan** (1981) defined the shrimp fishery management unit to include brown shrimp, white shrimp, pink shrimp, royal red shrimp, seabobs (*Xiphopenaeus kroyeri*), and brown rock shrimp (*Sicyonia brevirostris*). The purpose of the plan was to enhance yield in volume and value by deferring harvest of small shrimp to provide for growth. The main actions included: 1) establishing a cooperative Tortugas Shrimp Sanctuary with Florida to close a shrimp trawling area where small pink shrimp comprise the majority of the population most of the time; 2) a cooperative 45-day seasonal closure with Texas to protect small brown shrimp emigrating from bay nursery areas; and 3) a seasonal closure of an area east of the Dry Tortugas to avoid gear conflicts with stone crab fishermen.

Amendment 1/Environmental Assessment (EA) (1981) provided the Regional Administrator (RA) with the authority (after conferring with the Council) to adjust by framework action the size of the Tortugas Sanctuary or the extent of the Texas closure, or to eliminate either closure for one year.

Amendment 2/EA (1981) implemented mandatory reporting of statistical data by shrimp vessel owners and operators, dealers, and processors.

Amendment 3/EA (1982) resolved a shrimp-stone crab gear conflict on the west-central coast of Florida.

A **NMFS ESA Rule** (1987) required all shrimp trawlers 25 ft and longer in offshore waters to use qualified turtle excluder devices (TED) and all shrimp trawlers smaller than 25 ft to restrict tow times to 90 minutes or less. In inshore waters, at specified times, all shrimp trawlers were required to restrict tow times to 90 minutes or less. In both inshore and offshore waters, shrimp trawlers using TEDs were exempt from the tow time restrictions. The rule specified criteria and procedures for qualifying additional TEDs; specified vessel sizes, areas and seasons for which qualified TEDs or 90-minute tow times must be used; established reporting requirements; continued measures for resuscitation and release of captured sea turtles; and continued designated critical habitat. Initially, only four TED designs were approved: the NMFS' TED, the Cameron TED, the Matagorda TED, and the Georgia TED. The Morrison soft-TED was authorized later in the year.

Amendment 4/EA (1988) identified problems that developed in the fishery and revised the objectives of the FMP accordingly. The annual review process for the Tortugas Sanctuary was simplified, and the Council and RA review for the Texas closure was extended to February 1. A provision that white shrimp taken in the EEZ be landed in accordance with a state's size/possession regulations to provide consistency and facilitate enforcement with Louisiana was to have been implemented at such time when Louisiana provided for an incidental catch of undersized white shrimp in the fishery for seabobs. This provision was disapproved by NMFS with the recommendation that it be resubmitted after Louisiana provided for that bycatch. This resubmission was made in February of 1990 and applied to white shrimp taken in the EEZ and landed in Louisiana. It was approved and implemented in May of 1990.

Amendment 5/EA (1991) defined overfishing for Gulf brown, pink, and royal red shrimp and provided measures to restore overfished stocks if overfishing should occur. Action on the definition of overfishing for white shrimp was deferred, and seabobs and rock shrimp were removed from the management unit. The duration of the seasonal closure to shrimping off Texas was changed from June 1 through July 15 to May 15 through July 15 to conform to changes in state regulations.

Amendment 6/EA (1992) eliminated the annual reports and reviews of the Tortugas Shrimp Sanctuary in favor of monitoring and an annual stock assessment. Three seasonally opened areas within the sanctuary continue to open seasonally, without need for annual action. A proposed definition of overfishing of white shrimp was rejected by NMFS because it was not based on the best available data.

Amendment 7/EA (1994) defined overfishing for white shrimp and provided for future updating of overfishing indices for brown, white, and pink shrimp as new data became available. A total allowable level of foreign fishing for royal red shrimp was eliminated; however, a redefinition of overfishing for royal red shrimp was disapproved.

Amendment 8/EA (1995), implemented in early 1996, addressed management of royal red shrimp. It established a procedure that would allow total allowable catch for royal red shrimp to be set up to 30% above maximum sustainable yield (MSY) for no more than two consecutive years so that a better estimate of MSY could be determined. This action was subsequently negated by the 1996 Sustainable Fisheries Act amendment to the Magnuson-Stevens Act that defined overfishing as a fishing level that jeopardizes the capacity of a stock to maintain MSY and does not allow optimum yield to exceed MSY.

Amendment 9/supplemental EIS (1997) required the use of a NMFS certified bycatch reduction device (BRD) in shrimp trawls used in the EEZ from Cape San Blas, Florida to the Texas/Mexico border, and provided for the certification of BRDs and specifications for the placement and construction. The purpose of this action was to reduce the bycatch mortality of juvenile red snapper by 44% from the average mortality for the years 1984 through 1989. This amendment exempted shrimp trawls fishing for royal red shrimp seaward of the 100-fathom contour, as well as groundfish and butterfish trawls, from the BRD requirement. It also excluded small try nets and no more than two ridged frame roller trawls of limited size. Amendment 9

also provided mechanisms to change the bycatch reduction criterion and to certify additional BRDs.

Amendment 10/EA (2002) required BRDs in shrimp trawls used in the Gulf east of Cape San Blas, Florida. Certified BRDs for this area were required to demonstrate a 30% reduction by weight of finfish.

Amendment 11/EA (2001) required owners and operators of all vessels harvesting shrimp from the EEZ of the Gulf to obtain a federal commercial vessel permit. This amendment also prohibited the use of traps to harvest royal red shrimp from the Gulf and prohibited the transfer of royal red shrimp at sea.

Amendment 12/EA (2001) was included as part of the Generic Essential Fish Habitat (EFH) Amendment that established EFH for shrimp in the Gulf.

A **NMFS ESA rule** (2003) required the use of larger TED escape openings in otter trawl nets used to harvest shrimp to improve the exclusion leatherback turtles and adult loggerheads and green turtles. Also, the double-cover escape opening was introduced, which consists of two mesh flaps covering the escape hole and provides enhanced turtle exclusion as well as improved shrimp retention.

Amendment 13/EA (2005) established an endorsement to the federal commercial shrimp vessel permit for vessels harvesting royal red shrimp; defined the overfishing and overfished thresholds for royal red shrimp; defined MSY and OY for the penaeid shrimp stocks in the Gulf; established bycatch reporting methodologies and improved collection of shrimping effort data in the EEZ; required completion of a Gulf Shrimp Vessel and Gear Characterization Form by vessels with federal shrimp permits; established a moratorium on the issuance of federal commercial shrimp vessel permits; and required reporting and certification of annual landings during the moratorium.

August 2006 Regulatory Amendment (2006) changed the BRD certification criterion for penaeid shrimp trawling in the EEZ from being based on the expected reduction in the mortality of red snapper to the expected reduction in finfish catch. The change in the BRD certification criterion addressed shrimp trawl bycatch more comprehensively and increased flexibility, promoted innovation, and allowed for a wider variety of BRDs which allowed fishermen to choose the most effective BRD for fishing conditions and therefore reduce overall finfish bycatch. This amendment also certified the Modified Jones-Davis BRD for use in the Gulf and South Atlantic shrimp fisheries, provisionally certified the extended funnel BRD for use in the Gulf shrimp fishery, and provisionally certified the composite panel BRD to be used in the Gulf and South Atlantic shrimp fisheries. The amendment also consolidated and made modifications to the BRD Testing Manuals for the Gulf and the South Atlantic regions.

Amendment 14/EIS (2007) was a joint amendment with Reef Fish Amendment 27. It established a target red snapper bycatch mortality goal for the shrimp fishery in the western Gulf of 74% relative to the benchmark years of 2001-2003, reducing that target goal to 67% beginning in 2011 and eventually reducing the target to 60% by 2032. The amendment also defined

seasonal closure restrictions that can be used to manage shrimp fishing effort in relation to the target red snapper bycatch mortality reduction goal. If necessary, a seasonal closure of the shrimp fishery in areas (add areas) will occur at the same time as the annual closure of federal waters, which occurs in conjunction with the Texas closure. The need for a closure will be determined by the RA based on an annual assessment by the SEFSC. The assessment will use shrimp effort data for the most recent 12-month period available and will include a recommendation regarding the geographical scope and duration of the closure. The SEFSC's assessment will be provided to the RA on or about March 1 of each year. It also established a framework procedure to streamline the management of shrimp fishing effort in the western Gulf.

A **Framework Action** (2008) made revisions to BRD specifications and testing protocols, including lowering the needed bycatch reduction for BRDs in the western Gulf from 44% to 30% to be consistent with the eastern Gulf and the South Atlantic.

A **Framework Action** (2009) decertified the expanded mesh and Gulf Fisheye BRDs. This action also modified the allowable configuration for the Fisheye BRD, such that it could not be placed farther forward than 9 ft from the tie-off rings.

The Generic Annual Catch Limit (ACL)/Accountability Measures (AM) Amendment/EIS (2011) set an ACL and AM for royal red shrimp. Penaeid shrimp were exempt from the ACL/AM requirements because of their annual life cycle.

A **Framework Action** (2012) certified the two BRDs that were provisionally certified in 2010. It also lowered the effort reduction threshold established in Amendment 14 from 72% to 67%.

The Shrimp ELB Framework Action (2013) established a cost-sharing system for the ELB program and described new equipment and procedures for the program.

Amendment 15/EA (2015) redefined stock status criteria for the three penaeid species of shrimp including MSY and overfished/overfishing thresholds. The general framework procedure was also updated.

Amendment 16/SEIS (2015) eliminated duplicative AMs and the quota for royal red shrimp. The ACL was set equal to the acceptable biological catch and a post-season AM was established.

Amendment 17A/EA (2017) extended the Gulf commercial shrimp vessel permit moratorium for 10 more years through October 26, 2026.

Amendment 17B/EA (2017) defined the aggregate MSY of 112,531,374 pounds of tails for all shrimp species and an aggregate OY of 85,761,596 pounds of tails for all shrimp species. This amendment allows for the creation of a reserve permit pool when certain conditions are met, and mandates that the Council convene a review panel to review the details of a permit pool if the number of permits reaches 1,175. This amendment also allows vessels possessing shrimp to transit through federal waters without a federal permit if their trawl doors and nets are out of the water and bag straps are removed.

Amendment 18/Categorical Exclusion (CE) (2019) reduced the target reduction goal for juvenile red snapper mortality in the federal Gulf penaeid shrimp trawl fishery from 67% to 60% and modified the FMP framework procedures to allow changes to the target reduction goal for juvenile red snapper mortality through the abbreviated framework documentation process.

A **NMFS ESA Rule (EIS)** (2019, effective 2021) required skimmer trawl vessels 40 feet and greater in length that are rigged for harvesting shrimp to install and use TEDs designed to exclude small turtles in their nets. The space between the deflector bars of the new TEDs must not exceed 3 inches and escape openings must be oriented at the top of the net. There are webbing restrictions on the escape opening flap depending on the type of TED grid and escape opening configuration.

1.4 Description of the Physical, Biological, and Ecological Environment

The Gulf has a total area of approximately 600,000 square miles (1.5 million km^2), including state waters (Gore 1992). It is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel (Figure 1.4). 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 surface water temperatures range from 54º F to 84º F (12º C to 29º C) depending on time of year and depth of water. Mean annual sea surface temperatures ranged from 73º F through 83º F (23-28º C) including bays and bayous (Figure 1.3.1) between 1982 and 2009, according to satellite-derived measurements (NODC 2011[1]). Daily mean temperatures in the Gulf ranged from approximately 70º F--88º F from 1984 – 2023, with an average annual temperature ranging from approximately 79º F--81º F with no discernable trend over the same time period (NOAA Physical Oceanography Division of the Atlantic Oceanographic and Meteorological Laboratory, data from June 13, 2023). In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

[1] https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:0072888

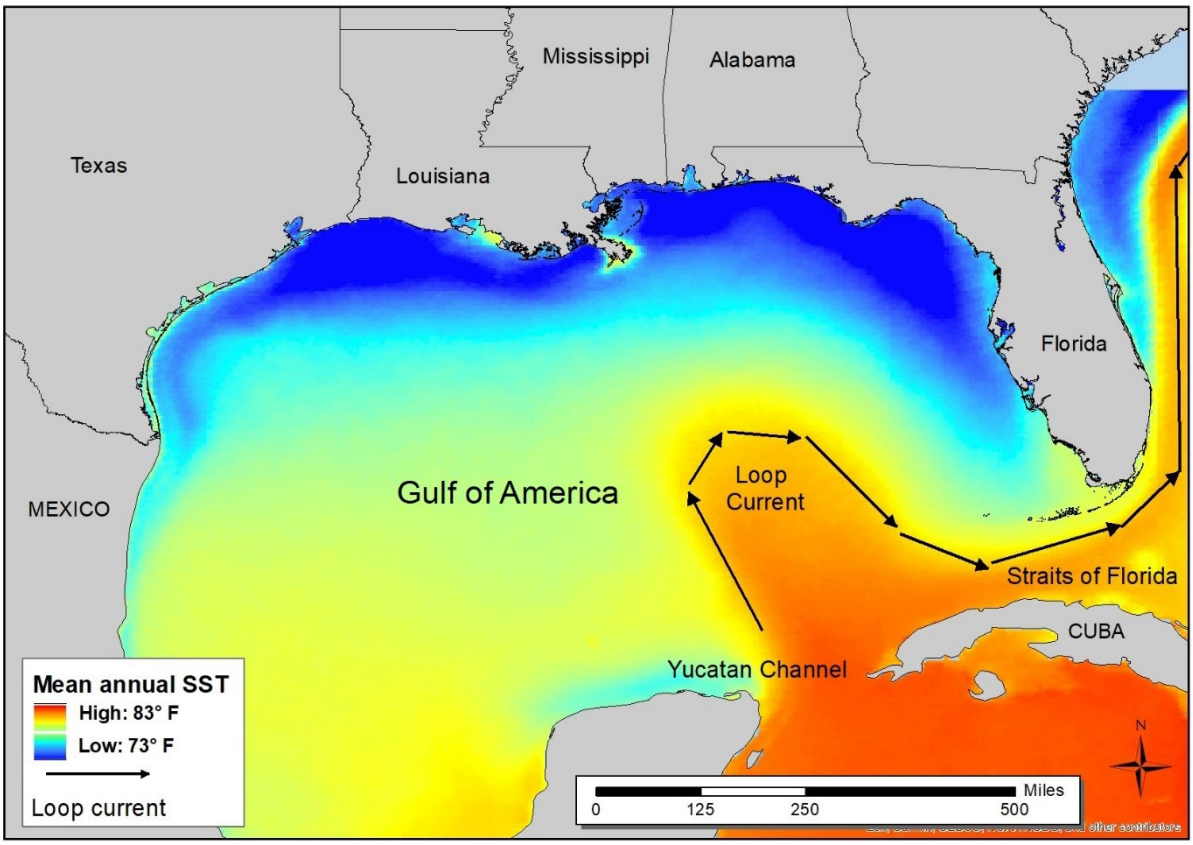

Figure 1.3.1. Physical environment of the Gulf, including major feature names and mean annual sea surface temperature as derived from the Advanced Very High-Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (http://accession.nodc.noaa.gov/0072888)

In the Gulf, adult penaeid shrimp are found nearshore and offshore on silt, mud, and sand bottoms; juveniles are found in estuaries. Primary fishing grounds for royal red shrimp are: the Desoto Canyon about 75 miles off Mobile, Alabama; offshore of Tampa Bay, Florida; and the Dry Tortugas northwest of the Florida Keys.

Detailed information pertaining to habitat areas of particular concern (HAPC) is provided in Generic Essential Fish Habitat (EFH) Amendment (2005) and Amendment 9 to the FMP for the Coral and Coral Reefs of the Gulf of Mexico, U.S. Waters (GMFMC 2018). These reef and bank areas in the northwestern Gulf include: East and West Flower Garden Banks, Stetson Bank, Sonnier Bank, MacNeil Bank, 29 Fathom, Rankin Bright Bank, Geyer Bank, McGrail Bank, Bouma Bank, Rezak Sidner Bank, Alderice Bank, and Jakkula Bank, Florida Middle Grounds HAPC and Pulley Ridge HAPC.

Additional area closures, some that include gear restrictions, may affect targeted and incidental harvest of penaeid shrimp species in the Gulf. The areas include:

- Cooperative Texas Shrimp Closure
- Tortugas Shrimp Sanctuary
- Southwest Florida Seasonal Closure

- Central Florida Seasonal Closure
- Longline/Buoy Gear Area Closure
- Madison-Swanson and Steamboat Lumps Marine Reserves
- The Edges Marine Reserve
- Tortugas North and South Marine Reserves
- Alabama Special Management Zone

Northern Gulf 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 into 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).

NOAA-supported scientists announced that the 2025 Gulf "dead zone" is approximately 4,402 square miles, the 15th smallest zone on record in 39 years of measurement. This equates to more than 2.8 million acres of habitat potentially unavailable to fish and bottom-dwelling species. For 2024, the dead zone was estimated to be 6,705 square miles and in 2023 was estimated to be 3,058 square miles. In 2022, the extent of the hypoxic area was 3,275 square miles, almost double what it was in 2020 (2,116 square miles), but still less than the extent of the 2017 hypoxic area (8,776 square miles). The changes in hypoxic area can be attributed to changing amounts of river discharge and its associated nutrient load and storm events. The major factor for the reduced size in 2020 was the active storm season with Hurricane Hanna passing right over the zone, allowing for mixing of the waters. The 2022 hypoxia area was lower than the 5-year hypoxic area average (5,408 square miles), but larger than the 1,930 square mile goal set by the Interagency Mississippi River/Gulf of America Hypoxia Task Force to be reached by 2035. 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).

Deepwater Horizon MC252 Oil Spill

The presence of polycyclic aromatic hydrocarbons (PAH), which are highly toxic chemicals that tend to persist in the environment for long periods of time, in marine environments can have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2012). The future reproductive success of fish species may be negatively affected by episodic events resulting in high-mortality years or low recruitment. These episodic events could leave gaps in the age structure of the population, thereby affecting future reproductive output (Mendelssohn et al. 2012). Other studies have described the vulnerabilities of various marine finfish species, with morphological and/or life history characteristics similar to species found in the Gulf, to oil spills and dispersants (Hose et al. 1996; Carls et al. 1999; Heintz et al. 1999; Short 2003).

In addition to the crude oil, over a million gallons of the dispersant, Corexit 9500A®, was applied to the ocean surface and an additional hundreds of thousands of gallons of dispersant was pumped to the mile-deep wellhead (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted until the Deepwater Horizon MC252 oil spill. Thus, no data exist on the environmental fate of dispersants in deep water. Twenty-first century dispersant applications are thought to be less harmful than their predecessors. However, the combination of oil and dispersants has proven to be more toxic to marine fishes than either dispersants or crude oil alone. Marine fish which are more active (e.g. a pelagic species versus a demersal species) appear to be more susceptible to negative effects from interactions with weathered oil/dispersant emulsions. These effects can include mobility impairment and inhibited respiration (Swedmark et al. 1973). The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern.

The biological environment of the Gulf, including the species addressed in this amendment, is described in detail in the Generic EFH Amendment (GMFMC 2005), hereby incorporated by reference and summarized below.

Target Species

Brown, white, and pink shrimp use a variety of habitats as they grow from planktonic larvae to spawning adults (GMFMC 1981a). Brown shrimp eggs are demersal and occur offshore. Post-larvae migrate to estuaries through passes on flood tides at night mainly from February until April; there is another minor peak in the fall. Post-larvae and juveniles are common in all U.S. estuaries from Apalachicola Bay, Florida to the Mexican border. Brown shrimp post-larvae and juveniles are associated with shallow, vegetated, estuarine habitats, but may occur on silt, sand, and non-vegetated mud bottoms. Adult brown shrimp occur in marine waters extending from mean low tide to the edge of the continental shelf and are associated with silt, muddy sand, and sandy substrates. More detailed discussion on habitat associations of brown shrimp is provided in Nelson (1992) and Pattillo et al. (1997).

White shrimp eggs are demersal and larval stages are planktonic in nearshore marine waters. Post-larvae migrate through passes mainly from May until November with peaks in June and September. Juveniles are common in all Gulf estuaries from Texas to the Suwannee River in Florida. Post-larvae and juveniles commonly occur on bottoms with large quantities of decaying organic matter or vegetative cover such as mud or peat. Juvenile migration from estuaries occurs in late August and September and is related to juvenile size and environmental conditions (e.g., sharp temperature drops in fall and winter). Adult white shrimp are demersal and inhabit nearshore Gulf waters to depths of 16 fathoms (96 feet) on soft bottoms. More detailed information on habitat associations of white shrimp is available from Nelson (1992) and Pattillo et al. (1997).

Pink shrimp eggs are demersal, early larvae are planktonic, and post-larvae are demersal in marine waters. Juveniles inhabit almost every U.S. estuary in the Gulf but are most abundant in Florida. Juveniles are commonly found in estuarine areas with seagrass where they burrow into the substrate by day and emerge at night. Adults inhabit offshore marine waters, with the highest concentrations in depths of 5 to 25 fathoms (30 to 150 feet).

Royal red shrimp occur exclusively in the exclusive economic zone (EEZ) and live longer than penaeid shrimp; however, their detailed life history is poorly known. Royal red shrimp become mature at three years, do not fully recruit to the fishery until they are 2-3 years old, and many year classes may occur in the same location (i.e., fishing grounds) (Reed and Farrington 2010). Royal red shrimp decrease in size with increasing depth; juveniles likely occur in deeper habitats (Paramo and Saint-Paul 2011), and females are larger than males (Tavares 2002; Paramo and Saint-Paul 2011).

The three species of penaeid shrimp harvested by the shrimp fishery are short-lived and provide annual crops while royal red shrimp live longer (2-5 years). The condition of each shrimp stock is monitored annually, and none has been classified as overfished or undergoing overfishing (Hart 2016a, 2016b, 2016c). The most recent stock assessment (SEDAR 87) was completed in 2025 with a terminal year of data being 2022 and revealed that no overfishing was occurring and the species were not overfished (SEDAR 87 Gulf White, Pink, and Brown Shrimp – SEDAR – SouthEast Data, Assessment, and Review).

Bycatch

Most bycatch in the shrimp fishery are discards of no value to the vessel, with a limited amount being regulatory discards. Scott-Denton et al. (2020) found that about 27.4% of catch in the Gulf penaeid shrimp fishery was targeted shrimp (i.e. brown, white, pink). Between 2007 and 2010, 185 species were observed as bycatch in the shrimp fishery (Scott-Denton et al. 2012). The majority of catch and bycatch was composed of unspecified fish, Atlantic croaker, other arthropods and invertebrates, and sea trout (Table 1.4.1). The species composition is spatially and bathymetrically dependent, but overall, for the Gulf, Atlantic croaker, sea trout, and longspine porgy are the dominant finfish species taken in trawls (approximately 26% of the total catch by weight). Other commonly occurring species include: portunid crabs, mantis shrimp, spot, inshore lizardfish, sea robins, and Gulf butterfish. Although red snapper comprise a very small percentage (0.3% by weight) of overall bycatch, the mortality associated with this bycatch affects the recruitment of older fish (age-2 and above) to the directed fishery and ultimately the recovery of the red snapper stock.

Table 1.3.1. Most common catch and bycatch species from observed Gulf shrimp fisheries from 2011-2016. Values in percentage of observed catch.

Common Name	Scientific Name	Gulf Penaeid Shrimp Percentage	Gulf Rock Shrimp Percentage	Gulf Skimmer Trawl Percentage
Fish (Unspecified)	Pisces	31.8	22.0	32.7
Atlantic Croaker	*Micropogonias undulatus*	15.7	0.3	10.6
Brown Shrimp	*Farfantepenaeus aztecus*	12.6	1.3	32.5
White Shrimp	*Litopenaeus setiferus*	11.4	0.0	9.6
Arthropod Other	Crustacea	6.2	3.9	4.2
Seatrout	*Cynoscion* spp.	5.4	0.1	1.5
Invertebrates	Invertebrate	5.2	7.6	0.6
Pink Shrimp	*Farfantepenaeus duorarum*	3.4	1.7	-
Longspine Porgy	*Stenotomus caprinus*	3.1	-	-
Rock Shrimp	*Sicyonia* spp.	0.3	35.6	-
Other Important Species				
Red Snapper	*Lutjanus campechanus*	0.3	0.0	0.0
Spanish Mackerel	*Scomberomorus maculatus*	0.2	0.0	0.3
Red Drum	*Sciaenops ocellatus*	0.2	-	0.0
Lane Snapper	*Lutjanus synagris*	0.2	0.0	0.0

Scott-Denton et al., 2020

To address finfish bycatch issues, especially bycatch of red snapper, the Council initially established regulations requiring bycatch reduction devices (BRD) specifically to reduce the bycatch of juvenile red snapper. In 1998, all shrimp trawlers operating in the EEZ, inshore of the 100-fathom contour, west of Cape San Blas, Florida were required to use BRDs; later BRDs were required in the eastern Gulf (GMFMC 2002). Only three Gulf states (Florida, Louisiana, and Texas) require the use of BRDs in state waters. Shrimp trawls fishing for royal red shrimp seaward of the 100-fathom (600 feet) contour are exempt from the requirement for BRDs. Bycatch is currently considered to be reduced to the extent practicable in the Gulf shrimp fishery.

Protected Species and Protected Species Bycatch

NMFS manages marine species in the Southeast region protected under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). A brief summary of these two laws and more information is available on NMFS Office of Protected Resources website.[2] Species in the Gulf protected under the ESA include: marine mammal species (blue, sperm, sei, fin, and Rice's whales, and manatees); sea turtles (Kemp's ridley, loggerhead (North Atlantic distinct population segment (DPS)), green (North Atlantic DPS), leatherback, and hawksbill); fish species (Gulf sturgeon, smalltooth sawfish, giant manta ray, oceanic whitetip shark, and Nassau grouper); and coral species (elkhorn coral, lobed star coral, boulder star coral, and mountainous star coral).

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

The impacts of the Gulf shrimp fishery on ESA-listed species were evaluated in the most recent "Reinitiation of ESA Section 7 Consultation on the Implementation of the Sea Turtle Conservation Regulations under the ESA and the Authorization of the Southeast U.S. Shrimp Fisheries in Federal Waters under the Magnuson-Stevens Fishery Management and Conservation Act" (Biological Opinion [BiOp]; NMFS 2021). The BiOp, which was based on the best available commercial and scientific data, concluded the continued authorization of the southeast U.S. shrimp fisheries in federal waters (including the Gulf shrimp fishery) is not likely to jeopardize the continued existence of threatened or endangered species (NMFS 2021). NMFS is preparing to reinitiate ESA section 7 consultation on the fishery for unanticipated observed lethal incidental take of giant manta rays and new information revealing effects of the fishery on smalltooth sawfish and giant manta rays not considered in the 2021BiOP

Sea Turtles

Five species of sea turtles (Kemp's ridley, loggerhead (Northwest Atlantic Ocean DPS), green (North Atlantic), leatherback, and hawksbill) occur in the Gulf. Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles are all highly migratory and are known to occur in areas subject to shrimp trawling. Bycatch of the species by commercial fisheries is a major contributor to past declines and a potential threat to future recovery (NMFS and USFWS 1991, 1992a, 1992b, 2008; NMFS 2011a). Historically, southeastern U.S. shrimp fisheries (both Gulf and South Atlantic) have been the largest threat to benthic sea turtles. Regulations requiring turtle excluder devices (TEDs) have reduced mortalities from trawl fisheries on sea turtles. NMFS (2021), using data from 2007-2015, estimated the combined southeastern U.S. otter trawl shrimp fisheries results in 27,509 annual estimated captures in trynets and standard nets combined, and 1,085 sea turtle mortalities in trynets and standard nets combined.

Fish

Five species of fish (Gulf sturgeon, smalltooth sawfish, Nassau grouper, oceanic whitetip shark and giant manta ray) occur in the Gulf. Of these, only smalltooth sawfish and giant manta ray are adversely affect by the shrimp trawl fishery. Otter trawls may directly affect smalltooth sawfish that are foraging within or moving through an active trawling location via direct contact with the gear. The long toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in any type of netting gear, including the netting used in shrimp trawls. Giant manta rays also are entangled and entrapped in shrimp trawl nets. Babcock et al. (2025) estimated bycatch in the Gulf shrimp fishery for sawfish for 2015 to 2023 and for giant manta rays from 2019 to 2023. Bycatch estimates for smalltooth sawfish in the Gulf shrimp fishery ranged from 30 animals (CI: 6-74) in 2013 to 123 animals (CI: 47-258) in 2020. Mean model-based bycatch estimates for giant manta ray in the Gulf ranged from 385 animals (CI: 144-781) in 2021 to 863 animals (CI: 357-1643) in 2023

Coral

Six species of coral (elkhorn, staghorn, lobed star, mountainous star, boulder star, and rough cactus) occur in the Gulf. Adverse effects from the shrimp fishery on these corals are extremely unlikely to occur, given differences between shrimp and coral preferred habitats, and protective regulations in place prohibiting or limiting trawling in areas where corals are most likely to occur (NMFS 2021).

Marine Mammals
The five whale species that may be present in the Gulf (blue, sperm, sei, fin, and Rice's) are all listed as endangered under the ESA. Rice's and sperm whales are the only endemic populations of whales in the Gulf. Rice's whales are the only resident baleen whales in the Gulf. Manatees, listed as threatened under the ESA, also occur in the Gulf and are the only marine mammal species in this area managed by the U.S. Fish and Wildlife Service. NMFS (2021) concluded the shrimp fishery is extremely unlikely to adversely affect any whale protected by the ESA.

The shrimp fishery is classified in the proposed 2025 List of Fisheries as a Category II fishery (89 FR 77789; September 24, 2024). This classification indicates the annual mortality and serious injury of a marine mammal stock is greater than 1% but less than 50% of the stocks potential biological removal, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The classification is based on interactions reported through observer reports, stranding data, and fisheries research data, with multiple strategic and non-strategic marine mammal stocks of dolphins. NMFS observed 12 dolphin takes (of which 11 were serious injuries or mortalities) since 1993; 11 of which were taken since 2002.

1.5 Description of the Economic Environment

Descriptions of the Gulf shrimp fishery are contained in previous amendments, as well as NMFS regulatory actions, and are incorporated herein by reference [see Shrimp Amendment 17b (GMFMC 2017) and Shrimp 18 (GMFMC 2019)]. The following discusses certain key characteristics of the Gulf shrimp fishery.

The Gulf shrimp fishery consists of three major sectors: harvesting sector, dealer/wholesaler sector, and processing sector. The following discussion provides summary statistics and selected characteristics for the harvesting sector, shrimp dealers, and the processing sector. Imports are also presented. All monetary values presented throughout this section have been adjusted to 2023 dollars using the annual, not seasonally-adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

The harvesting sector is composed of two types of fleets: 1) a small vessel fleet that is predominantly active in inshore and state offshore waters and very diverse with respect to gear and other operating characteristics; and 2) a large vessel fleet predominantly active in offshore waters, particularly the EEZ, and almost always using otter trawl gear. In 2003, a federal shrimp permit was instituted requiring vessels to possess the permit when fishing for penaeid shrimp in the Gulf EEZ. A moratorium on the issuance of new federal shrimp permits became effective in March 2007, with full conversion of open access permits to shrimp moratorium permits (SPGM) by 2008. Currently, vessels must possess a SPGM when fishing for penaeid shrimp in the Gulf EEZ. In addition, a royal red shrimp endorsement, which is an open access permit for those holding a SPGM, is required for harvesting royal red shrimp in the Gulf.

Selected Characteristics of Participating Vessels in the Shrimp Fishery
Selected characteristics of participating vessels in the Gulf shrimp fishery during 2019 through 2023 are summarized in Table 1.5.1. Estimates of the total number of active shrimp vessels are

based on the number of unique vessels landing shrimp as recorded in the state trip ticket (STT) data. The number of active permitted vessels was generated by cross referencing STT landings data with the NMFS permits database.

The number of permitted and non-permitted active vessels (i.e., vessels with reported landings in the Gulf shrimp fishery) steadily declined from 2019 through 2023 (Table 1.5.1). While shrimp landings over this period remained relatively stable, with an average of 111 million lbs, gross revenue decreased by 51%, driven by a steep reduction in average price from $3.65 to $1.91. Despite being fewer in number, federally permitted vessels accounted for 68% of shrimp landings and 78% of shrimp revenue in the fishery on average from 2019 through 2023 (Table 1.5.1). The average annual price received per lb of shrimp was also significantly higher for vessels with a SPGM permit than those without one. On average (2019 through 2023), each active shrimp vessel with a SPGM permit earned approximately $301,000 in gross revenue per year. The percent of all vessels with a SPGM permit that were active decreased over time, as did the average number of months that each active vessel fished (Table 1.5.1).

Table 1.5.1. Selected characteristics of participation in the Gulf shrimp fishery, 2019-2023.*

	2019	2020	2021	2022	2023	Average
Total Gulf shrimp fishery						
Number of active vessels	3,558	3,348	3,154	2,971	2,467	3,100
Landing (lbs, heads off)	115,092,015	108,521,986	114,217,843	110,844,516	107,021,123	111,139,497
Gross revenue (2023 $)	$419,971,258	$385,240,167	$471,294,385	$341,043,074	$204,439,084	$364,397,594
Average Price (2023 $)	$3.65	$3.55	$4.13	$3.08	$1.91	$3.26
Gulf shrimp vessels WITH federal SPGM permit						
Number of vessels	1,416	1,399	1,377	1,356	1,332	1,376
Number of active vessels	1,020	981	950	919	790	932
Percent active	72%	70%	69%	68%	59%	68%
Average active months per vessel	6.0	6.0	5.9	4.8	4.7	5.5
Landing (lbs, heads off)	76,012,854	76,382,286	79,937,847	74,093,166	72,160,111	75,717,253
Gross revenue (2023 $)	$318,966,619	$306,505,939	$372,958,493	$259,860,103	$161,231,726	$283,904,576
Average Price (2023 $)	$4.20	$4.01	$4.67	$3.51	$2.23	$3.72
Gulf shrimp vessels WITHOUT federal SPGM permit						
Number of active vessels	2,538	2,367	2,204	2,052	1,677	2,168
Average active months per vessel	4.3	4.1	4.1	3.8	3.9	4.1
Landing (lbs, heads off)	39,079,161	32,139,700	34,279,996	36,751,350	34,861,013	35,422,244
Gross revenue (2023 $)	$101,004,639	$78,734,228	$98,335,892	$81,182,971	$43,207,358	$80,493,018
Average Price (2023 $)	$2.58	$2.45	$2.87	$2.21	$1.24	$2.27

Source: C. Liese, pers. comm. 2024. STT data processed using SEDAR87 conventions. Permit data from SERO.
*These results are preliminary.
Note: Active in the context of this table means a vessel that landed at a Gulf port at least 1 lb of shrimp from offshore or inshore waters in the Gulf in a given year (or month, for active months).

Key Economic and Financial Characteristics of Federally Permitted Shrimp Vessels
The following descriptions are based on economic performance metrics of the federal Gulf shrimp fishery for the years 2019 through 2023 (C. Liese, pers. comm. 2024). These data are collected via the Annual Economic Survey of Federal Gulf Shrimp Permit Holders. The first survey, which was administered in 2007, collected data for the 2006 fishing year, and these surveys have been conducted every year since.

The type of economic data the survey collects is based on an accounting framework of money flows and values associated with the productive activity of commercial shrimping. With these data, three financial statements (the balance sheet, the cash flow statement, and the income statement) are prepared to give a comprehensive overview of the financial and economic situation of the offshore shrimp fishery. Table 1.5.2 shows a preliminary summary of these financial statements. Dollar values are averages in 2023 dollars.

From 2019 through 2023, owner's equity in the average active shrimp vessel was substantial and stable over time (Table 1.5.2). This resulted from a combination of a relatively high market value of the assets (vessel and permits being the main assets) and low liabilities (mainly loans). Net cash flows and net revenue from operations for the average active vessel were positive and increasing through 2021, but both turned negative in 2022 and remained so in 2023. This corresponds with the reduction in shrimp price seen in recent years (Table 1.5.1). Negative cash flows are troublesome and if they persist could lead to solvency issues for shrimp businesses. Approximately half of total expenses incurred by shrimp fishing businesses were non-labor costs (fuel and supplies) in 2022 and 2023, with the other half being split across labor and fixed costs (e.g., maintenance, repair, insurance, overhead, and vessel depreciation). Active shrimp vessels experienced losses, on average, in 2022 and 2023, which may affect the long-term viability of these businesses. Average government payments and non-operating revenue also shrank in 2022 and 2023, which exacerbated the overall decrease in profit before tax during those years. Individual businesses may be more or less profitable than others, depending on their operating characteristics.

Table 1.5.2. Economic and financial characteristics of an average active vessel with a federal Gulf commercial shrimp permit (SPGM), 2019-2023. Parentheses indicate negative values and all dollar values are averages in 2023 dollars.*

	2019	2020	2021	2022	2023	Average
Number of observations	268	274	271	238	204	251
Balance Sheet						
Assets	$370,112	$346,222	$389,621	$364,444	$331,303	$360,341
Liabilities	$20,076	$35,215	$32,871	$32,899	$22,321	$28,676
Equity	$350,036	$311,007	$356,751	$331,545	$308,982	$331,664
Cash Flow						
Inflow	$356,777	$332,748	$447,461	$313,750	$242,796	$338,706
Outflow	$329,665	$301,212	$387,039	$321,688	$247,682	$317,457
Net cash flow	$27,112	$31,537	$60,422	($7,938)	($4,885)	$21,249
Income Statement						
Revenue (commercial fishing operations)	$342,207	$324,548	$441,829	$313,347	$241,334	$332,653
Expenses						
Variable costs – Non-labor	47.36%	40.38%	44.80%	51.71%	50.53%	46.96%
Variable costs – Labor	30.03%	33.85%	33.72%	26.35%	25.12%	29.81%
Fixed costs	22.61%	25.78%	21.48%	21.94%	24.35%	23.23%
Net revenue from operations	$918	$9,887	$43,497	($15,616)	($14,635)	$4,810
Net receipts from non-operating activities	$13,905	$7,236	$5,022	($314)	$311	$5,232
Profit or loss (before tax)	$14,824	$17,122	$48,519	($15,930)	($14,324)	$10,042
Returns						
Economic return on asset value	0.2%	2.9%	11.2%	(4.3%)	(4.4%)	1.1%
Return on equity	4.2%	5.5%	13.6%	(4.8%)	(4.6%)	2.8%

Source: C. Liese, pers. comm. 2024, as based on The Annual Economic Survey of Federal Gulf Shrimp Permit Holders, NMFS-SEFSC.
*These results are preliminary.

Dealers

The information in Table 1.5.3 illustrates the purchasing activities of seafood dealers that bought Gulf shrimp from vessels during 2019 through 2022, with preliminary data for 2023.[3] During this period, the number of shrimp dealers, as well as total shrimp purchases, trended downwards modestly. On average, from 2019 through 2022, annual shrimp purchases accounted for around 84% of all purchases made by these dealers, suggesting a high level of specialization. The median annual value of Gulf shrimp purchases and total seafood purchases per Gulf shrimp dealer experienced an increasing trend from 2019 through 2021 and then a dip in 2022 (Table 1.5.3). Although the median values of Gulf shrimp and total seafood purchases per dealer appear

[3] Because 2023 is preliminary and partial year data, trends will only be discussed for 2019-2022.

relatively small, $18,143 and $25,594, respectively on average, Gulf shrimp dealers are a very heterogeneous group. Many if not most "dealers" are actually vessel owners and fishermen who have chosen to act as their own dealers and bypass so-called "middlemen" so they can reduce costs and retain more of their net revenue (profit). A much smaller number of these dealers are also shrimp processors, and their operations generate much larger revenues, on average. Although not shown in the table, the maximum annual value of all purchases made by a single Gulf shrimp dealer from 2019 through 2022 was approximately $19.9 million (2023 dollars), which occurred in 2021.

Table 1.5.3. Dealer statistics for dealers that purchased Gulf shrimp landings by year, 2019-2023. Pounds (lbs) are in whole weight (ww). All dollar estimates are in 2023 dollars.

Year	Number of Dealers	Gulf Shrimp** landed lbs ww (millions)	Gulf Shrimp Purchases (millions)	Other Gulf Seafood Purchases (millions)	South Atlantic Seafood Purchases (millions)	Median Gulf Shrimp purchases value per dealer	Median total seafood purchases value per dealer
2019	743	187.9	$429.7	$46.7	$21.2	$14,851	$22,801
2020	684	175.5	$394.2	$37.1	$18.7	$17,959	$23,694
2021	601	183.4	$479.1	$46.0	$29.2	$22,133	$33,335
2022	642	178.0	$346.6	$32.0	$22.1	$17,630	$22,545
2023*	420	105.6	$157.5	$34.4	$16.6	$25,458	$36,508
Average (2019-2022)	668	181.2	$412.4	$40.5	$22.8	$18,143	$25,594

Source: SEFSC Fishing Communities Web Query Tool (Version Feb 11, 2025 Years: 2014-2023).
*The values presented for 2023 are preliminary and may be incomplete. Therefore, these values are excluded from the table averages and should be interpreted with caution.
**Only shrimp species included in the STT database are included in these estimates.
Note: Medians, as opposed to means, are reported because the data distributions are highly skewed.

Selected characteristics for Gulf shrimp processors are provided in Table 1.5.4. The number of Gulf shrimp processors decreased steadily from 2019 through 2022, then rose slightly in 2023, averaging 49 during this time. The annual value of processed shrimp increased from 2019 through 2020, then declined steadily through 2023, with an overall decrease of 28% (Table 1.5.4). Like dealers, shrimp processors are also very specialized. Shrimp products accounted for more than 92% of the total value processed between 2019 and 2023. However, processors are much larger businesses on average (2019 through 2023) than dealers, with the value of processed shrimp and all processed products per processor having medians of $4.92 million and $5.64 million (2023 dollars), respectively. Economic trends in the processing sector do not exactly mirror trends in the harvesting and dealer sectors because processors process imported product in addition to domestic product.

Table 1.5.4. Selected characteristics of the Gulf shrimp processing industry by year, 2019-2023. Pounds (lbs) are in whole weight (ww). All dollar estimates are in 2023 dollars.

Year	Number of Processors	Processed shrimp* in lbs ww (millions)	Value of processed shrimp (millions)	Total value of all products processed by Gulf shrimp processors (millions)	Median value of processed shrimp per processor (millions)	Median total value of all products processed per Gulf shrimp processor (millions)	Median number of employees per processor
2019	52	232.37	$839.90	$908.33	$5.87	$7.00	24
2020	51	198.27	$902.34	$974.54	$4.06	$4.16	22
2021	49	196.91	$840.11	$907.99	$5.42	$6.66	23
2022	46	167.47	$677.23	$738.77	$6.22	$6.89	30
2023	49	174.79	$604.65	$662.64	$3.00	$3.48	30
Average (2019-2022)	49	193.96	$772.85	$838.45	$4.92	$5.64	26

Source: Office of Science and Technology, pers. comm. Feb 11, 2025.
*Includes all shrimp regardless of where harvested, but only includes shrimp processed for human consumption (i.e., shrimp processed for bait are excluded).
Note: Medians, as opposed to means, are reported because the data distributions are highly skewed.

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 local markets. At the harvest level for shrimp, imports affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to the domestic production of shrimp, imports tend to cushion the adverse economic effects on consumers resulting from a reduction in domestic landings. The following describes the imports of products that directly compete with the domestic harvest of shrimp.

On average, between 2019 and 2023, the United States imported more than 1.3 billion pounds (product weight) of shrimp products annually, worth approximately $5.8 billion. There was an increasing trend in shrimp imports from 2019 through 2021 and then a modest cool down through 2023 (Table 1.5.5). Three nations, including India, Ecuador, and Indonesia, have been responsible for the vast majority of shrimp imports in recent years. The top ports for receiving shrimp imports were New York, New York, Los Angeles, California, and Miami, Florida.

Table 1.5.5. Annual pounds and value of shrimp imports and share of imports by country, 2019-2023.

	2019	2020	2021	2022	2023
Pounds of shrimp imports (product weight, million pounds)*	1,235.1	1,268.8	1,554.3	1,401.6	1,351.7
Value of shrimp imports (millions, 2023 $)	$5,607	$5,613	$6,890	$5,989	$4,837
Share of Imports by Country					
INDIA	49%	41%	43%	40%	41%
ECUADOR	14%	21%	25%	30%	32%
INDONESIA	18%	20%	17%	17%	15%
VIETNAM	2%	4%	5%	4%	4%
MEXICO	5%	4%	3%	3%	3%
ARGENTINA	2%	3%	2%	3%	2%
THAILAND	3%	3%	2%	2%	2%
PERU	1%	1%	1%	1%	0%
GUYANA	1%	1%	0%	0%	0%
all others	3%	2%	2%	2%	1%

Source: Fisheries trade data from the Foreign Trade Division of the U.S. Census Bureau, as purchased by NOAA Fisheries (available at: https://www.fisheries.noaa.gov/national/sustainable-fisheries/foreign-fishery-trade-data).
*Excludes heavily processed shrimp products (e.g., frozen dinners).

Business Activity

The commercial harvest and subsequent sales and consumption of shrimp generate business activity as fishermen expend funds to harvest shrimp and consumers spend money on goods and services, such as shrimp purchased at a local seafood market or 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 seafood markets, grocers, restaurants, and fishing supply establishments. In the absence of the availability of a given species for purchase, consumers would spend their money on substitute goods and services. As a result, the analysis presented below represents a distributional analysis only; that is, it only shows how economic 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.

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

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

Economic impact models are used to determine the current economic impacts of an industry or sector, as well as changes expected to occur if expenditures or gross revenues change in a particular industry or sector. Estimates of the U.S. average annual economic impacts associated with the commercial harvest of shrimp by federally permitted vessels in the Gulf were derived using the model developed for and applied in the Fisheries Economics of the United States 2022 Report (NMFS 2024) and are provided in Table 1.5.6. [4] These economic impacts are 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. Gross Domestic Product (GDP). These impacts should not be added together because this would result in double counting. 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. Average gross revenue from federally permitted shrimp vessels averaged about $283.9 million (2023 dollars) between 2019 and 2023. This gross revenue generated employment, income, output impacts, and value-added impacts of approximately 29,297 jobs, $1 billion, $2.7 billion, and $1.4 billion, respectively (Table 1.5.6).

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

Table 1.5.6. Average economic impacts (2019 through 2023) associated with the commercial harvest of shrimp by federally permitted vessels in the Gulf. All monetary estimates are in thousands of 2023 dollars.

Harvesters	Direct	Indirect	Induced	Total
Employment impacts	4,114	802	928	5,844
Income impacts	$118,069	$33,351	$58,118	$209,539
Total value-added impacts	$125,856	$119,513	$100,365	$345,733
Output Impacts	$283,905	$275,923	$192,912	$752,739
Primary dealers/processors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	1,113	444	771	2,328
Income impacts	$50,014	$46,091	$43,594	$139,699
Total value-added impacts	$53,312	$58,811	$82,074	$194,198
Output impacts	$160,974	$121,248	$160,434	$442,656
Secondary wholesalers/distributors	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	281	62	272	615
Income impacts	$16,201	$4,818	$17,039	$38,059
Total value-added impacts	$17,270	$8,082	$29,105	$54,457
Output impacts	$43,395	$15,822	$56,602	$115,818
Grocers	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	1,731	195	382	2,308
Income impacts	$47,972	$15,832	$23,915	$87,720
Total value-added impacts	$51,136	$25,511	$40,488	$117,135
Output impacts	$81,989	$41,435	$79,489	$202,913
Restaurants	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	14,831	977	2,394	18,202
Income impacts	$264,594	$79,292	$149,756	$493,642
Total value-added impacts	$282,044	$141,735	$252,321	$676,100
Output impacts	$515,722	$221,795	$497,904	$1,235,422
Harvesters and seafood industry	**Direct**	**Indirect**	**Induced**	**Total**
Employment impacts	22,070	2,480	4,748	29,297
Income impacts	$496,851	$179,385	$292,422	$968,658
Total value-added impacts	$529,618	$353,652	$504,353	$1,387,623
Output impacts	$1,085,984	$676,222	$987,341	$2,749,548

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2024).

1.6 Description of the Social Environment

This amendment affects the commercial management of shrimp in the Gulf. The following description presents baseline information on fishing participants and fishing communities in order to present the communities that are expected to be primarily affected by the action in this amendment because they are the most engaged in and/or reliant on the fishery. Shrimp permits

are included by state to provide information on the geographic distribution of permit holders. Descriptions of the top-ranking communities by the number of commercial shrimp permits and commercial engagement and reliance for these top communities are included. Lastly, social vulnerability data are presented for all top-ranking communities. Community level data are presented in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which requires the consideration of the importance of fishery resources to human communities when changes to fishing regulations are considered.

Social Dimensions of the Shrimp Fishery

SEDAR 87 includes an overview of the social dimensions of the Gulf shrimp fishery (Griffith 2023) and this description of the state and federal shrimp fishery is included herein by reference; however, some relevant portions are summarized here. The number of vessels and boats involved in shrimping in the Gulf in 1981, when the original Shrimp FMP was developed, was estimated at 4,585 vessels (displacing > 5 tons gross weight) and 5,475 boats (displacing < 5 tons gross weight). At that time, Texas included about 40% of the vessels and Louisiana comprised about 73% of the boats. Management and legislative efforts, such as limited entry and state buy-back programs to limit effort or added costs to shrimpers are noted as having been partially responsible for the reduction of the fleet. Most of the state and federal fishing management efforts have been focused on protecting shrimp stocks and sustaining commercial and recreational shrimping, but additional measures to protect sea turtles and other bycatch, such as TEDs have been implemented. Problems affecting Gulf shrimping include labor, on shrimp boats and in the processing sector, and imported shrimp, which drives down the prices of shrimp while influencing the consumer appreciation of shrimp quality. There have been recent efforts by shrimpers to influence state legislators to ban sales of or tax imported shrimp which have resulted from fears that imported shrimp will put shrimpers out of business. The destruction of coastal habitat from sources such as housing development, coastal erosion, sea level rise, industrial development, contamination, and pollution can influence shrimp spawning populations. The ethnic make-up of the Gulf shrimping industry has changed over time, starting in the 1970s and through today, from an influx of refugees from Vietnam who began moving into the area to take advantage of the region's fishing resources and the passing of immigration reform which authorized guest workers from Mexico, Central America, Caribbean, and other parts of the world to work in seasonal processing. It is estimated that the current proportion of Vietnamese shrimpers ranges from about 20% to 40% of the fleet.

1.6.1 Commercial Sector

Permits

A Gulf shrimp moratorium (SPGM) permit is required for vessels to harvest shrimp in federal waters. The greatest proportion of Gulf shrimp moratorium permits are issued to vessels with homeports in Texas (average of 34.6% from 2019-2024), followed by Louisiana (28.6%), Florida (13.1%), Alabama (10.2%), and Mississippi (7.8%, Table 1.6.1.1). Vessels with homeports in other states (California, Georgia, Hawaii, Massachusetts, North Carolina, New Jersey, Oregon, South Carolina, Virginia, and Washington) also hold Gulf shrimp permits, but these states represent a small percentage of the issued permits (SERO Permit Office, 2019-2024).

The number of Gulf shrimp permits has decreased over time, with a recent loss of 131 permits from 2019 to 2024 (Table 1.6.1.1). During this time period, the number of permits decreased in the majority of Gulf states with Texas experiencing the greatest loss in the number of permits (-54); whereas there was a slight gain in the number of permitted vessels with homeports in Alabama (+4). The total number of shrimp permits in Table 1.6.1.1 varies from the number of permits presented elsewhere in the document because it includes a total for each year, rather than a total for a particular date.

Table 1.6.1.1. Gulf shrimp permits by state and year, from 2019-2024.

	AL	FL	LA	MS	TX	Other	Total
2019	135	189	398	114	500	82	1418
2020	137	186	393	111	494	79	1400
2021	141	183	401	107	473	79	1384
2022	143	176	395	107	464	75	1360
2023	142	172	387	103	457	74	1335
2024	139	165	369	99	446	69	1287

Source: SERO Permits Office. Note: includes valid and renewable SPGM permits.

Gulf shrimp permits are held by those with homeports in 184 communities (SERO Permits Office, 2024). Communities with the most Gulf shrimp permits are located in Texas, Alabama, Louisiana, Mississippi, and Florida (Table 1.6.1.2). The communities with the most shrimp permits are Brownsville, Texas (8.6% of shrimp permits); Bayou La Batre, Alabama (7.5%); and New Orleans, Louisiana (7.2%).

Table 1.6.1.2. Top homeports by number of Gulf shrimp permits.

State	Community	Permits
TX	Brownsville	111
AL	Bayou La Batre	97
LA	New Orleans	93
MS	Biloxi	69
TX	Port Lavaca	64
TX	Port Isabel	47
TX	Palacios	44
LA	Chauvin	38
TX	Galveston	36
TX	Port Arthur	31
FL	Hernando Beach	29
FL	Fort Myers Beach	26
TX	Houston	22
LA	Abbeville	20
LA	Galliano	20
LA	Venice	20

Source: SERO Permits Office, 2024.

Engagement and Reliance

In order to understand how communities are engaged and reliant on fishing, indices were created using secondary data from permit and landings information for the commercial sector (Jepson and Colburn 2013 and Jacob et al. 2013). Fishing engagement is primarily the absolute numbers of permits, landings, and value for all species. For commercial fishing, the analysis used the number of vessels designated commercial by homeport and owner address, value of landings, and total number of commercial permits for each community for all species. Fishing reliance includes the same variables as fishing engagement divided by population to give an indication of the per capita influence of this activity. Using a principal component and single solution factor analysis, each community receives a factor score for each index to compare to other communities. Two thresholds of one and one-half standard deviation above the mean are plotted to help determine a threshold for significance. The factor scores are standardized; therefore, a score above a value of 1 is also above one standard deviation. A score above ½ standard deviation is considered engaged or reliant with anything above one standard deviation to be very engaged or reliant.

Figure 1.6.1.1 is an overall measure of a community's commercial fishing engagement and reliance and includes the communities with the top number of shrimp permits as depicted in Table 1.6.1.2. The majority of the communities in Figure 1.6.1.1 would be considered highly or moderately engaged in commercial fishing, as most are at or above 1 standard deviation of the mean factor score and a few are at or above ½ standard deviation. Galliano, Louisiana and Houston, Texas show the least amount of engagement in commercial fishing overall. A larger share of the included communities demonstrate low commercial reliance; however several included communities demonstrate high or moderate commercial reliance (Bayou La Batre,

Alabama; Fort Myers Beach, Florida; Hernando Beach, Florida; Abbeville, Louisiana; Chauvin, Louisiana; Venice, Louisiana; Palacios, Texas; and Port Isabel, Texas).

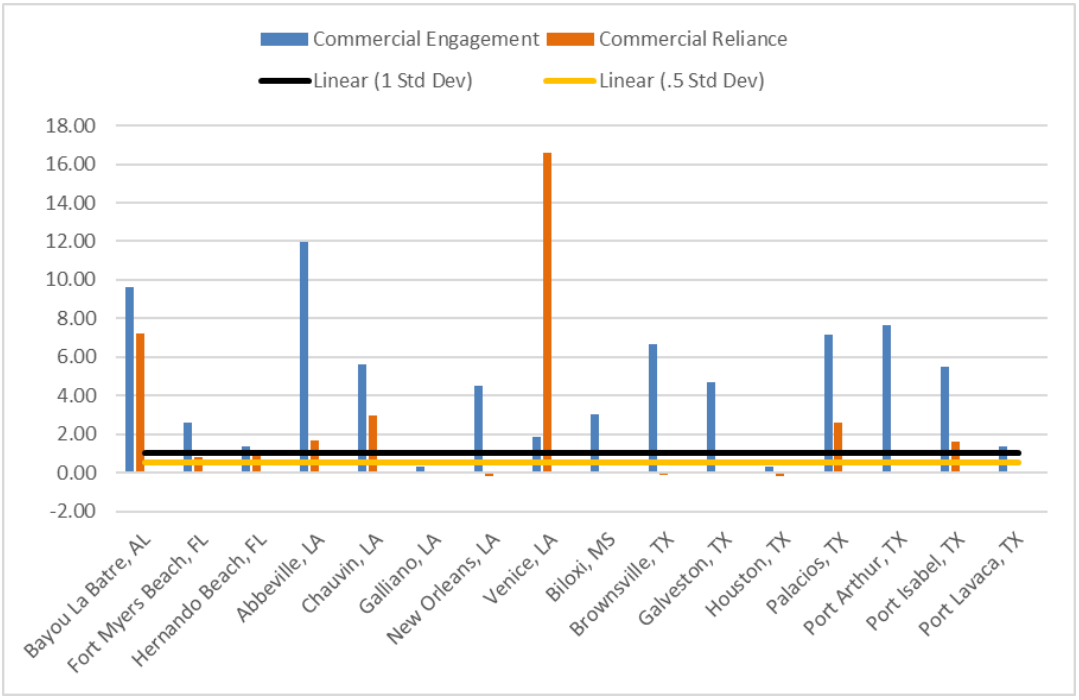

Figure 1.6.1.1. Commercial fishing engagement and reliance for top shrimp permitted communities.
Source: SERO, Community Social Vulnerability Indicators Database 2021.

Social Vulnerability

A suite of indices were created using census data to examine the social vulnerability of coastal communities. 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. Poverty includes poverty rates for different groups; population composition includes more single female-headed households, households with children under the age of five, minority populations, and those that speak English less than well; and personal disruption includes disruptions such as higher separation rates, higher crime rates, and unemployment. Increased rates in the indicators are signs of populations experiencing vulnerabilities. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Figure 1.6.1.2 provides social vulnerability rankings for place-based communities identified in Table 1.6.1.2 as communities with the top number of shrimp permits. Several communities exceed the threshold of one standard deviation above the mean for at least one of the indices (Bayou La Batre, Alabama; Abbeville, Chauvin, Galliano, New Orleans, and Venice, Louisiana; and Brownsville, Houston, Port Arthur, and Port Isabel, Texas). These communities would be the most likely to exhibit vulnerabilities to social or economic disruption resulting from regulatory change.

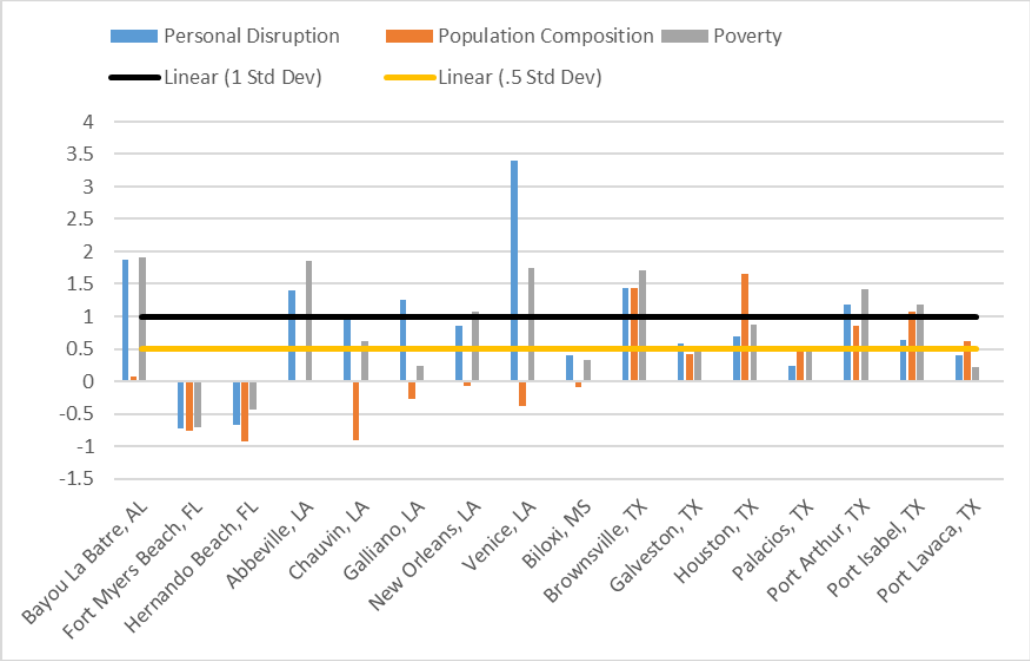

Figure 1.6.1.2. Social vulnerability indices for top shrimp communities.
Source: SERO, Community Social Vulnerability Indicators Database 2022.

The description of fishing activities presented above highlights the communities most involved in Gulf shrimp fishing. It is expected that the impacts from the regulatory action in this amendment, positive or negative, will likely affect those communities.

CHAPTER 2. MANAGEMENT OPTIONS

2.1 Action - Address the Expiration of the Federal Shrimp Permit Moratorium in the Gulf

Option 1: No Action. The moratorium on the issuance of new federal Gulf commercial shrimp vessel permits expires on October 26, 2026. With expiration of the federal Gulf commercial shrimp permit moratorium, the commercial shrimp vessel permits will become open access permits, as they were prior to the moratorium, and therefore will be available to any eligible applicants.

Option 2: Extend the moratorium on the issuance of federal Gulf commercial shrimp vessel permits. The moratorium would be extended for 10 years.

Option 3: Create a federal limited access permit for commercial shrimp vessels in the Gulf. To be eligible for a commercial shrimp vessel permit under the limited access system, vessels must have a valid or renewable federal Gulf commercial shrimp vessel permit on October 26, 2026. Federal Gulf commercial shrimp vessel permits would need to be renewed every year, and all previous renewal, transfer, and reporting requirements would still be in effect.

Discussion:

The moratorium on the issuance of federal Gulf commercial shrimp permits was established in Amendment 13 to the Shrimp FMP (GMFMC 2005a). The purpose of the amendment was to help stabilize the shrimp fishery. Increasing fuel costs, decreasing shrimp prices, and increasing foreign shrimp imports all contributed to the overcapitalization of the commercial shrimp fleet. Since the implementation of the moratorium, the number of permits has decreased each year with terminations highest in 2010 (terminations = 184 permits), (Table 1.1.1). In recent years (2019-2023), permit terminations have been between 18 to 48 terminations per year. Vessels were expected to continue to exit the fishery until the reduced number of permits allowed the resource to be harvested profitably (GMFMC 2005a). Compared with pre-moratorium status, fishing effort in the offshore fishery has decreased, and landings have slightly declined (Figure 2.1.1). Additionally, the catch per unit effort (CPUE) for the offshore fishery has remained generally higher than that of the pre-moratorium status, excluding the 2006 year prior to moratorium (Figure 2.1.1).

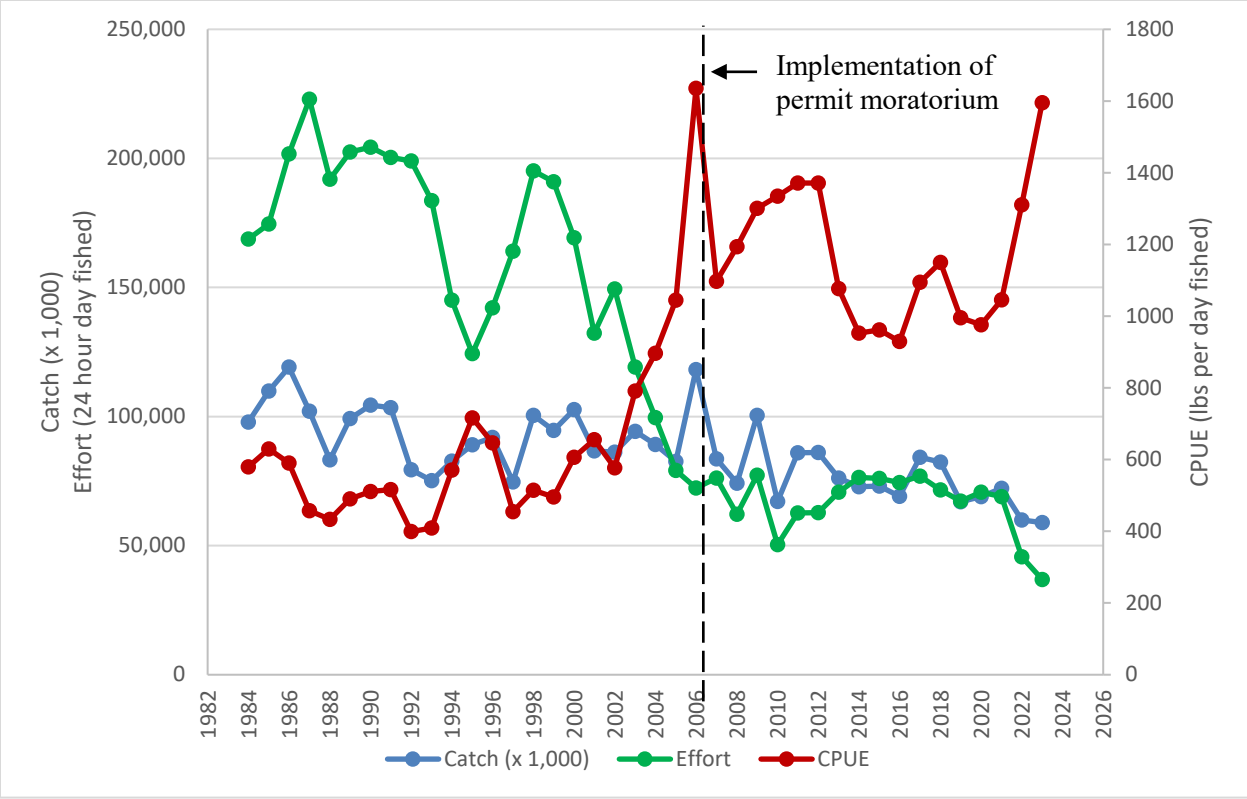

Figure 2.1.1. Catch[5], effort and CPUE from 1984-2023 for all shrimp caught in offshore waters[6] and landed in Gulf ports.[7]

Option 1 would allow the moratorium to expire and federal Gulf shrimp permits would become open access. This would allow new entrants into the commercial shrimp fishery and could have negative effects if the fishery became overcapitalized. Overcapitalization and/or effort increases could lead to increases in bycatch of both protected resources and red snapper and potentially result in additional requirements for bycatch reduction or closures. In addition, under this alternative, permits would no longer be transferrable because they would be freely available from the National Marine Fisheries Service (NMFS) and therefore, would have no market value.

Option 2 would extend the permit moratorium for 10 years. This could reduce the number of federal permits if additional permits are terminated. Extending the moratorium for 10 more years would allow for more data collection (with the recognition that 17 years of data under the permit moratorium exists from 2007-2023), in comparison to a shorter moratorium extension and

[5] Catch represents heads off poundage of shrimp.

[6] Offshore waters are waters outside the COLREGS lines. The COLREGS lines are the set of demarcation lines that have been established by the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (commonly called COLREGS). COLREGS define boundaries across harbor mouths and inlets for navigation purposes.

[7] Although landings information can be obtained from both the Gulf Shrimp System (GSS) and Annual Landings Form (ALF) databases, effort is not reported on the ALF, and it is not possible to determine whether the reported landings on the ALF came from offshore or inshore waters. Thus, landings estimates are based solely on GSS data, and only shrimp landed at Gulf ports are taken into account. Further, because separate permits are not required to harvest each of the penaeid species, and multiple species of shrimp may be harvested simultaneously, these estimates include all shrimp harvested from offshore waters, regardless of whether they are federally managed.

in recognition of the time required to complete work on an amendment, and may result in a stable number of permits if fewer fishermen exit the fishery. The number of permits that have terminated has continued to decline (Table 1.1.1) and is reaching the 1,072 minimum threshold number of Gulf shrimp permit vessels. Once the minimum number of valid or renewable Gulf shrimp permits reaches 1,175, the Council will form a review panel to review the details of a permit pool and other options (GMFMC 2017). The review panel is anticipated to form, and the Council will likely take subsequent action prior to expiration of the continued moratorium in **Option 2**. A permit pool or other option established by the Council may be ineffective if the moratorium subsequently expires, as compared to operating under a federal limited access permit program considered under **Option 3**.

Option 3 would create a federal limited access permit for commercial shrimp vessels in the Gulf, which is similar to a moratorium but without an expiration date for the moratorium. Current permit holders would receive the limited access permit if their vessel has a valid or renewable federal Gulf commercial shrimp permit on October 26, 2026. The new federal Gulf commercial shrimp vessel permits would still need to be renewed every year, and all previous renewal, transfer, and reporting requirements would still be in effect. This alternative would make the federal commercial shrimp fishery a limited access fishery until the Council took action to change that status, unlike a permit moratorium which acts like a limited access permit but has an expiration date. Additionally, the number of permits could continue to decline due to non-renewal of permits unless the Council implements other measures. For **Option 2** and **Option 3**, persons wishing to enter the fishery could purchase a valid permit from another permit holder. A permit must be valid to be transferred; permits that have expired but are still renewable cannot be transferred unless and until they are renewed prior to termination. Option 3 follows the conventions of previous open access permits that go through a moratorium phase to evaluate the suitability of a limited access permit before converting to a limited access permit. Currently, the federal Gulf shrimp permit moratorium is the longest time a southeast permit has remained in a temporary status after being placed in a moratorium.

CHAPTER 3. REGULATORY IMPACT REVIEW

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4.5 Identification of all relevant federal rules, which may duplicate, overlap or conflict with the proposed rule

4.6 Significance of economic effects on small entities

4.7 Description of significant alternatives to the proposed action and discussion of how the alternatives attempt to minimize economic impacts on small entities

CHAPTER 5. LIST OF PREPARERS AND REVIEWERS

PREPARERS

Name	Expertise	Responsibility	Agency
Matthew Freeman	Economist	Co-Team Lead – Amendment development, economic analyses	Gulf Council
Rich Malinowski	Fishery Biologist	Co-Team Lead – Amendment development, biological analyses	SERO
Christina Package-Ward	Anthropologist	Social analyses	SERO
David Records	Economist	Economic analyses	SERO
Jessica Stephen	Fishery Biologist	Data analyses	SERO
Mike Larkin	Fishery Biologist	Data analyses	SERO

REVIEWERS (Preparers also serve as reviewers)

Name	Expertise	Responsibility	Agency
Anne Kersting	Attorney	Legal review	NOAA GC
John Froeschke	Biologist	Review	Gulf Council
Matt Walia	Law Enforcement	Review	OLE
Lisa Hollensead	Biologist	Review	Gulf Council
Adam Bailey	Technical writer and editor	Regulatory writer	SERO
Jennifer Lee	Biologist	Protected Resources review	SERO
David Dale	Biologist	Essential Fish Habitat review	SERO
Frank Helies	Fishery Biologist	Review	SERO
Carrie Simmons	Biologist	Review	Gulf Council
John Froeschke	Biologist	Review	Gulf Council
Matthew Johnson	Biologist	Review	SEFSC
Christopher Liese	Economist	Review	SEFSC

NOAA GC = National Oceanic and Atmospheric Administration General Counsel; SEFSC = Southeast Fisheries Science Center; SERO = Southeast Regional Office of the National Marine Fisheries Service.

CHAPTER 6. REFERENCES

Abbott, J. and D. Willard. 2017. Rights-based management for recreational for-hire fisheries: Evidence from a policy trial. Fisheries Research, 196:106-116.

Adams, W. F. and C. Wilson. 1995. The status of the smalltooth sawfish, *Pristis pectinata* Latham 1794 (Pristiformes: Pristidae) in the United States. Chondros 6:1-5.

Anderes Alvarez, B. L. and I. Uchida. 1994. Study of hawksbill turtle (*Eretmochelys imbricata*) stomach content in Cuban waters. Pages 27-40 *in* Study of the hawksbill turtle in Cuba (I). Ministry of Fishing Industry, Cuba.

Aguilar-Perera, A. 1994. Preliminary observations of the spawning aggregation of Nassau grouper, *Epinephelus striatus*, at Majahual, Quintana Roo, Mexico. Proceedings of the Gulf and Caribbean Fisheries Institute 43**:**112-122.

Armstrong, A. O., A. J. Armstrong, F. R. A. Jaine, L. I. E. Couturier, K. Fiora, J. Uribe-Palomino, S. J. Weeks, K. A. Townsend, M. B. Bennett, and A. J. Richardson. 2016. Prey density threshold and tidal influence on reef manta ray foraging at an aggregation site on the Great Barrier Reef. PLoS ONE 11(5):e0153393.

Babcock, E.A, Peterson, C. and D. Woods. Smalltooth Sawfish and Giant Manta Ray Bycatch Assessment and Estimation of Observer Coverage Required in the Gulf of Mexico and South Atlantic Shrimp Trawl Fishery. National Marine Fisheries Service Southeast Fisheries Science Center and Rosenstiel School of Marine, Atmospheric, and Earth Science, 4600 Rickenbacker Causeway Miami, FL 33149-1031. April 2025.

Backus, R. H., S. Springer, and E. L. Arnold Jr. 1956. A contribution to the natural history of the white-tip shark, *Pterolamiops longimanus* (Poey). Deep-sea Research 3:178-188.

Bardach, J.E. 1958. On the movements of certain Bermuda reef fishes. Ecology 39(1):139-146.

Baum, J.E. Medina, J. A. Musick, and M. Smale. 2006. *Carcharhinus longimanus*. The IUCN red list of threatened species. www.iucnredlist.org (accessed June 2015).

Baustian, M. M. and N. N. Rabalais. 2009. Seasonal composition of benthic macroinfauna exposed to hypoxia in the northern Gulf of Mexico. Estuaries and Coasts 32:975–983.

Breitburg, D., L. A. Levin, A. Oschlies, M. Grégoire, F. P. Chavez, D. J. Conley, V. Garçon, D. Gilbert, D. Gutiérrez and K. Isensee (2018). "Declining oxygen in the global ocean and coastal waters." Science 359(6371): eaam7240.

Carls, M.G., S.D. Rice, and J.E. Hose. 1999. Sensitivity of Fish Embryos to Weathered Crude Oil: Part I. Low-level Exposure during Incubation Causes Malformations, Genetic Damage, and

Mortality in Larval Pacific Herring (*Clupea pallasi*). Environmental Toxicology and Chemistry 18(3): 481–493.

Craig, J.K. 2012. Aggregation on the edge: effects of hypoxia avoidance on the spatial distribution of brown shrimp and demersal fishes in the Northern Gulf of Mexico. Mar. Ecol. Prog. Ser., 445: 75–95.

GMFMC. 1981a. Fishery management plan for the shrimp fishery of the Gulf of Mexico, United States waters. Gulf of Mexico Fishery Management Council, Tampa, FL, 246 pp.

GMFMC. 1981b. Fishery management plan for the shrimp fishery of the Gulf of Mexico, United States waters. (Includes Amendments 1 & 2). Gulf of Mexico Fishery Management Council, Tampa, FL, 250 pp.

GMFMC. 1999. Regulatory amendment to the reef fish fishery management plan to set 1999 Gag/Black grouper management measures (revised). Gulf of Mexico Fishery Management Council, Tampa, Florida. 89 pp.

GMFMC. 2001. Generic amendment addressing the establishment of the Tortugas Marine Reserves. Gulf of Mexico Fishery Management Council, Tampa, Florida. 194 pp.

GMFMC. 2002. Amendment 10 to the fishery management plan for the shrimp fishery of the Gulf of Mexico, U.S. Waters. Gulf of Mexico Fishery Management Council, Tampa, FL. 153 pp.

GMFMC. 2005a. Amendment 13 to the fishery management plan for the shrimp fishery of the Gulf. Gulf Fishery Management Council, Tampa, Florida. 273 pp.

GMFMC. 2017. Final Amendment 17B to the fishery management plan for the shrimp fishery of the Gulf of Mexico, U.S. waters. Yield, threshold number of permits, and transit provisions. Gulf of Mexico Fishery Management Council, Tampa, FL.176 pp.

GMFMC. 2019. Final shrimp amendment 18 to the fishery management plan for the shrimp fishery of the Gulf of Mexico, U.S. waters, including fishery impact statement, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida. 81 pp.

Gore, R. H. 1992. The Gulf of Mexico: a treasury of resources in the American Mediterranean. Pineapple Press. Sarasota, Florida.

Griffith, D. 2023. Social Dimensions of the Gulf of Mexico Shrimp Fishery: Overview. SEDAR87-DW-02. SEDAR, North Charleston, SC.8 pp.

Hart, R. A. 2016a. Stock Assessment Update for Pink Shrimp (*Farfantepenaeus duorarum*) in the U.S. Gulf of Mexico for 2015. Report to the Gulf of Mexico Fisheries Management Council. 17 pp.

Hart, R. A. 2016b. Stock Assessment Update for White Shrimp (*Litopenaeus setiferus*) in the U.S. Gulf of Mexico for 2015. Report to the Gulf of Mexico Fisheries Management Council. 20 pp.

Hart, R. A. 2016c. Stock Assessment Update for Brown Shrimp (*Farfantepenaeus aztecus*) in the U.S. Gulf of Mexico for 2015. Report to the Gulf of Mexico Fisheries Management Council. 19 pp.

Heintz, R.A., J.W. Short, and S.D. Rice. 1999. Sensitivity of fish embryos to weathered crude oil: Part II. Increased mortality of pink salmon (*Oncorhynchus gorbuscha*) embryos incubating downstream from weathered Exxon *Valdez* crude oil. Environmental Toxicology and Chemistry 18(3): 494–503.

Hose, J.E., M.D. McGurk, G.D. Marty, D.E. Hinton, E.D Brown, and T.T. Baker. 1996. Sublethal effects of the (Exxon *Valdez*) oil spill on herring embryos and larvae: morphological, cytogenetic, and histopathological assessments, 1989–1991. Canadian Journal of Fisheries and Aquatic Sciences 53: 2355-2365.

Jacob, S., P. Weeks, B. Blount, and M. Jepson. 2013. Development and evaluation of social indicators of vulnerability and resiliency for fishing communities in the Gulf of Mexico. Marine Policy 37:86-95.

Jepson, M. and L. L. Colburn. 2013. Development of social indicators of fishing community vulnerability and resilience in the U.S. Southeast and Northeast Regions. U.S. Dept. of Commerce, NOAA Technical Memorandum NMFS-F/SPO-129, 64 p.

Nelson, D. M. 1992. Distribution and abundance of fishes and invertebrates in Gulf of Mexico Estuaries, Volume I: data summaries. ELMR Report No. 10. NOAA/NOS Strategic Environmental Assessments Division, Rockville, Maryland.

NMFS. 2011a. Biological opinion on the continued authorization of Reef Fish fishing under the Gulf of Mexico Reef Fish Fishery Management Plan. September 30, 2011. Available at: http://sero.nmfs.noaa.gov/pr/esa/Fishery%20Biops/03584%20GOM%20Reef%20Fish%20BiOp%202011%20final.pdf

NMFS. 2011b. A Users Guide to the National and Coastal State I/O Model. 2011. www.st.nmfs.noaa.gov/documents/commercial_seafood_impacts_2007-2009.pdf (accessed February 2016).

NMFS. 2021. Fisheries economics of the United States, 2017. U.S. Dept. of Commerce, NOAA Technical. Memo. NMFS-F/SPO-219, 246 pp.
Fisheries Economics of the United States Report, 2017 | NOAA Fisheries

NMFS. 2024. Fisheries Economics of the United States, 2022. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-248A, 28 p.

NMFS and USFWS. 1991 b. Recovery Plan for U.S. Population of Loggerhead Turtle. National Marine Fisheries Service, Washington, D.C.

Paramo, J. and U. Saint-Paul. 2011. Deep-sea shrimps *Aristaeomorpha foliacea* and *Pleoticus robustus* (Crustacea: Penaeoidea) in the Colombian Caribbean Sea as a new potential fishing resource. Journal of the Marine Biological Association of the United Kingdom 92: 811-818.

Pattillo, M. E., T. E. Czapla, D. M. Nelson, and M. E. Monaco. 1997. Distribution and abundance of fishes and invertebrates in Gulf of Mexico estuaries. Volume II: species life history summaries. ELMR Report No. 11. NOAA/NOS Strategic Environmental Assessment Division, Silver Spring, Maryland. 377 pp.

Reed, J. and S. Farrington. 2010. Distribution of deep-water commercial fisheries species-golden crab, tilefish, royal red shrimp- in deep-water habitats off eastern Florida from submersible and ROV dives. Report to the South Atlantic Fishery Management Council Contract No. SA (08-09)16, 163 pp. http://fau.digital.flvc.org/islandora/object/fau%3A6495

Scott-Denton, E., P. F. Cryer, M. R. Duffy, J. P. Gocke, M. R. Harrelson, D. L. Kinsella, J. M. Nance, J. R. Pulver, R. C. Smith, and J. A. Williams. 2012. Characterization of the U.S. Gulf of Mexico and South Atlantic penaeid and rock shrimp fisheries based on observer data. Marine Fisheries Review 74(4): 1-26. http://www.galvestonlab.sefsc.noaa.gov/publications/pdf/938.pdf

Short, J. 2003. Long-Term Effects of Crude Oil on Developing Fish: Lessons from the Exxon *Valdez* Oil Spill. Energy Sources 25(6): 509-517.

Swedmark, M., A. Granmo, and S. Kollberg. 1973. Effects of oil dispersants and oil emulsions on marine animals. Water Research 7(11): 1649-1672.

Tavares, M. 2002. Shrimps. Pages 251-291 *in* K.E. Carpenter, editor. The living marine resources of the western central Atlantic, species identification guide for fisheries purposes. FAO, Rome.

APPENDIX A. 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 (EEZ). 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) and E.O. 12866 (Regulatory Planning and Review, Chapter 5). Other applicable laws are summarized below.

Administrative Procedure Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the Act, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider, and respond to public comment on those rules before they are finalized. The Act also establishes a 30-day waiting period from the time a final rule is published until it takes effect. Proposed and final rules will be published before implementing the actions in this amendment.

Coastal Zone Management Act

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

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

Data Quality Act

The Data Quality Act (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such

as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

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

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

National Historic Preservation Act

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

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

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

Executive Orders (E.O.)

E.O. 12630: Takings

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

E.O. 12962: Recreational Fisheries

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

E.O. 13089: Coral Reef Protection

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

Regulations are already in place to limit or reduce habitat impacts within the Flower Garden Banks National Marine Sanctuary. Additionally, NMFS approved and implemented Generic Amendment 3 for Essential Fish Habitat (GMFMC 2005), which established additional habitat areas of particular concern (HAPCs) and gear restrictions to protect corals throughout the Gulf.

There are no implications to coral reefs by the actions proposed in this amendment.

E.O. 13132: Federalism

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

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

E.O. 13158: Marine Protected Areas

This E.O. requires federal agencies to consider whether their proposed action(s) will affect any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural or cultural resource within the protected area. There are several marine protected areas, 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.