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Modification of Fishing Access in Eastern Gulf of Mexico Marine Protected Areas

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

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FRAMEWORK ACTION COVER SHEET

Framework Action to the Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico: Modification of Fishing Access in Eastern Gulf of Mexico Marine Protected Areas, including Environmental Assessment, Regulatory Impact Review and Regulatory Flexibility Act Analysis.

Responsible Agencies and Contact Persons

Gulf of Mexico Fishery Management Council (Council)
4107 W. Spruce Street, Suite 200
Tampa, Florida 33607
Ryan Rindone (ryan.rindone@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 measure
AP	Advisory Panel
ATCA	Atlantic Tunas Convention Act
Atlantic HMS	Atlantic Highly Migratory Species Management Division
BiOp	biological opinion
CFR	code of federal regulations
CMP	coastal migratory pelagic
CMP FMP	Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Regions
Council	Gulf of Mexico Fishery Management Council
DLMToolkit	Data Limited Methods Toolkit
DPS	distinct population segment
DWG	Deepwater grouper
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
E.O.	executive order
ELB	electronic logbook
ESA	Endangered Species Act
FHS	for-hire survey
FMP	Fishery Management Plan
Gulf	Gulf of Mexico
HAPC	habitat area of particular concern
HMS	highly migratory species
ICAAT	International Commission for the Conservation of Atlantic Tunas
IFQ	individual fishing quota
IPCC	Intergovernmental Panel on Climate Change
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MMPA	Marine Mammal Protection Act
MPA	marine protected area
MRIP	Marine Recreational Information Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OY	optimum yield
PAH	polycyclic aromatic hydrocarbons
Reef Fish FMP	Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico
RFFA	reasonably foreseeable future actions
RIR	regulatory impact review
RQ	regional quotient
SAFE	Stock Assessment and Fishery Evaluation
Secretary	Secretary of Congress
SEDAR	Southeast Data and Review

SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SPMG	
SRD	
SRHS	Southeast Region Headboat Survey
SSC	Scientific and Statistical Committee
SWG	shallow water grouper
VOC	volatile organic compounds
VMS	Vessel Monitoring System

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CHAPTER 1. INTRODUCTION

1.1 Background

The Madison-Swanson and Steamboat Lumps marine protected areas (MPA) were established in June 2000 through a 1999 Regulatory Amendment to the Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico (Gulf) (Reef Fish FMP). The two sites combined cover 219 square nautical miles near the 40-fathom contour, off west central Florida (Figure 1.1.1). The MPAs provide protection to a portion of the gag spawning aggregations and offshore male population in response to the 1999 determination by the National Marine Fisheries Service (NMFS) that gag was undergoing overfishing and approaching an overfished condition (RFSAP 1999). Gag is a protogynous hermaphrodite, starting adult life as female and later transitioning to male. Since males constitute the older age classes in a stock, male gag may be vulnerable to declines from targeted fishing effort when heavily exploited. Gag form spawning aggregations where males may feed more aggressively than females, making males more likely to be caught via hook-and-line (Gilmore and Jones 1992; Koenig at al. 1996). A low ratio of male to female gag in the Gulf has been an ongoing concern (SEDAR 33 2014a; SEDAR 33 Update 2016). Scientific information at the time suggested that the proportion of male gag in the stock had declined substantially since the 1970s. The MPAs were to be in effect for 4 years to allow NMFS and the Gulf of Mexico Fishery Management Council (Council) to evaluate whether the closures were providing the desired protection.

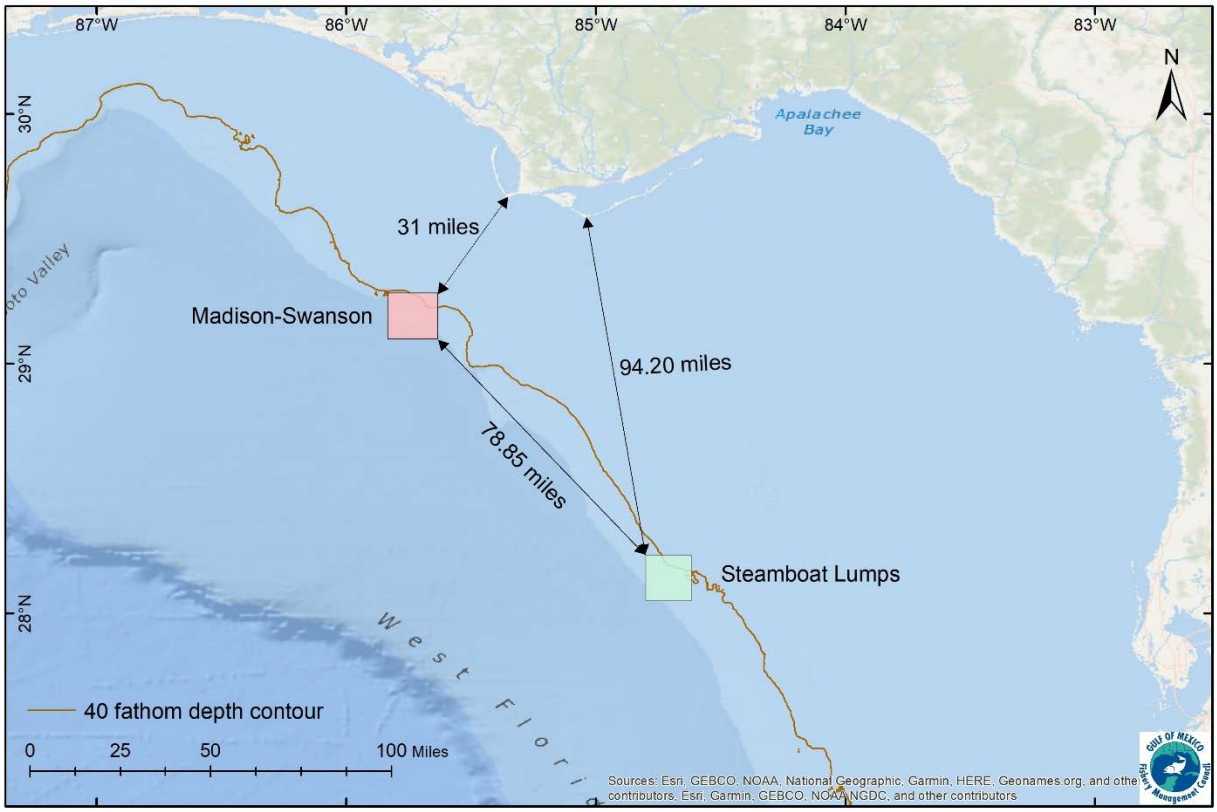

Figure 1.1.1. Map showing the relative locations and spatial coverages of the Madison-Swanson and Steamboat Lumps MPAs in the eastern Gulf of Mexico.

At the time the MPAs were established, the areas were closed to all fishing except fishing for highly migratory species (tunas, marlin, sailfish, swordfish, and oceanic sharks). The Council requested that NMFS' Atlantic Highly Migratory Species (HMS) Management Division issue a compatible rule prohibiting fishing for all Atlantic HMS in these two areas. However, as part of a settlement to a legal challenge to the closures, NMFS agreed to hold the Council's request to implement an HMS closure in abeyance, while research is conducted into the impact of the regulations, the effect of pelagic trolling on and ability to reach reef fish species, and the impact on enforceability by allowing pelagic trolling in the MPAs.

In 2002, NMFS reclassified gag as neither overfished nor undergoing overfishing; however, the stock's estimate of total biomass was below its optimum yield (OY) level. In Amendment 21 (GMFMC 2003b), the Council considered whether to continue the MPAs and whether to ease the fishing restrictions in the MPAs. The Council decided to continue the MPAs for an additional 6 years, to continue the protections afforded to the gag stock and spawning habitat, and to allow time for additional research into the effects of the MPAs. Based on the research on the effects of pelagic trolling, the Council also modified the fishing prohibition. The Council decided to allow trolling from May through October. However, the Council prohibited possession, except on vessels in transit with fishing gear stowed, of all fish species from November through April and all reef fish any time during the year. In 2009, the Council extended the MPAs indefinitely through Amendment 30B to the Reef Fish FMP (GMFMC 2008). Complementary measures for HMS vessels were implemented in 2006, with a sunset provision effective in June 2010 (71 FR

58058, Oct. 2, 2006). The sunset provision was removed before its effective date (74 FR 66585, Dec. 16, 2009).

At its October 2019 meeting, the Council's Reef Fish Advisory Panel (AP) discussed observations of illegal harvest of reef fish species under the guise of trolling within the boundaries of the MPAs. Reef Fish AP members were of the opinion that the MPAs are not a legitimate trolling destination and that rampant reef fish poaching is occurring. Reef Fish AP members also acknowledged that it was possible to drift through the MPAs with fishing tackle weighted deep below the vessel to increase the probability of hooking a reef fish. A Florida Fish and Wildlife Conservation Commission law enforcement officer present at that meeting noted that enforcement is difficult due to the remote location of the MPAs (see Figure 1.1.1). The Council discussed the AP's ultimate recommendation to prohibit all fishing (other than for HMS) in the MPAs year-round to combat the current occurrence of bottom fishing under the guise of trolling within the MPAs. The U.S. Coast Guard representative at the Council meeting concurred that enforcement in the MPAs can be difficult due to distance from port.

1.2 Purpose and Need

The purpose of this action is to modify fishing access in the Madison-Swanson and Steamboat Lumps MPAs in the eastern Gulf.

The need for this action is to reduce illegal fishing activities within the Madison-Swanson and Steamboat Lumps MPAs, whose purpose is to protect critical spawning aggregations of large, mature reef fish species.

1.3 History of Management

This history of management focuses on events pertinent to the creation of, and regulations applying to, the Madison-Swanson and Steamboat Lumps MPAs. A complete history of management for the Reef Fish FMP is available on the Council's website[1]

The final rule for the **Reef Fish FMP** (GMFMC 1981a) was effective November 8, 1984, and defined the reef fish fishery management unit.

The Madison-Swanson and Steamboat Lumps MPAs were initially created in June 2000 under an **August 1999 Regulatory Amendment**, on areas suitable for gag and other reef fish spawning aggregations, and were closed year-round to fishing for all species under the Council's jurisdiction. The two sites cover 219 square nautical miles near the 40-fathom contour, off west central Florida. The MPAs were initially created for a four-year period which was extended an additional six years through July 2010 in **Amendment 21**; this amendment also modified the fishing restrictions within the MPAs to allow surface trolling from May 1 – October 31 each year. The MPAs and their accompanying fishing restrictions were extended indefinitely in May 2009 by **Amendment 30B**.

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

CHAPTER 2. PROPOSED MANAGEMENT ALTERNATIVES

2.1 Action 1 - Modification of Surface Trolling Provisions for Madison-Swanson and Steamboat Lumps Marine Protected Areas (MPA)

Alternative 1: No Action - Surface trolling is allowed from May 1 through October 31 within the boundaries of the Madison-Swanson and Steamboat Lumps MPAs. Surface trolling is defined as fishing with lines trailing behind a vessel which is in constant motion at speeds in excess of four knots with a visible wake, and may not involve the use of downriggers, wire lines, planers, or similar devices.

Alternative 2: Prohibit fishing year-round in the Madison-Swanson and Steamboat Lumps MPAs. This prohibition does not apply to Atlantic highly migratory species (HMS).

Discussion:

All fishing was prohibited within the Madison-Swanson and Steamboat Lumps MPAs when the MPAs were originally created under the August 1999 Regulatory Amendment to the Fishery Management Plan (FMP) for Reef Fish Resources in the Gulf of Mexico (Gulf) (Reef Fish FMP; GMFMC 1999). The prohibition on fishing applies to all fish species, except those managed by the National Marine Fisheries Service's (NMFS) Atlantic Highly Migratory Species Division (Atlantic HMS)[2], which has since implemented complementary regulations for Atlantic HMS species. Amendment 21 to the Reef Fish FMP (GMFMC 2003b) revised the original fishing restrictions by creating an allowance for surface trolling (except for reef fish species) from May 1 – October 31, with all forms of fishing prohibited from November 1 – April 30 (**Alternative 1**).

Reverting the fishing restrictions back to prohibit all fishing as established in the August 1999 Regulatory Amendment would be expected to reduce fishing pressure in the MPAs (**Alternative 2**). This prohibition would not apply to Atlantic HMS, which are managed by NMFS Atlantic HMS (see Appendix A2 for Atlantic HMS regulations). Prohibiting all fishing within the MPAs would also make it easier for law enforcement officers, who remarked during Gulf of Mexico Fishery Management Council (Council) meetings about the difficulty of enforcing the current regulations in the MPAs. Presently, vessels are able to engage in surface trolling within the MPAs between May 1 – October 31, which can act as a cover for illegal bottom fishing activity. Members of the Council's Reef Fish Advisory Panel (AP) have noted observing such behavior while on state-sponsored research trips within the MPAs; these observations have been corroborated by law enforcement officers. Conversely, eliminating the May 1 – October 31

[2] A complete list of HMS species can be found at https://www.fisheries.noaa.gov/national/atlantic-highly-migratory-species/atlantic-highly-migratory-species-minimum-sizes-and-bag.

trolling provision could reduce surface trolling opportunities for anglers who currently take advantage of that allowance. However, as stated by the Council's Reef Fish AP at its October 2019 meeting, the MPAs may not constitute a viable destination for successful trolling activity.

Section 303(b)(2)(C) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) requires that when a FMP designates zones where all fishing is prohibited, that closure must: (i) be based on the best scientific information available; (ii) include criteria to assess the conservation benefit of the closed area; (iii) establish a timetable for review of the closed area's performance that is consistent with the purposes of the closed area; and (iv) be based on an assessment of the benefits and impacts of the closure, including its size, in relation to other management measures (either alone or in combination with such measures), including the benefits and impacts of limiting access to: users of the area, overall fishing activity, fishery science, and fishery and marine conservation. When the prohibition on all fishing in Madison-Swanson and Steamboat Lumps MPAs was first in place when these areas were created, the goals and expected impacts of the restrictions were the protection of spawning aggregations of gag, protection of spawning habitat, and protection of a portion of the offshore male population of gag. In addition, incidental benefits to other reef fish that occupy the same area would be likely.

Per Section 303(b)(2)(C) of the Magnuson-Steven Act, the Madison-Swanson and Steamboat Lumps MPAs were created in June 2000 (GMFMC 1999) using the best scientific information available (i); a certification that was reaffirmed in June 2004 (GMFMC 2003b) and May 2009 (GMFMC 2008), with the latter making the MPAs permanent. These amendments to the Reef Fish FMP assessed the conservation benefits associated with closing the areas as required in criteria (ii). The MPAs were initially created for a four-year period (GMFMC 1999) which was extended six more years through July 2010 (GMFMC 2003b), with a modification to the fishing restrictions within the MPAs to allow surface trolling from May 1 – October 31 each year. The MPAs and their accompanying fishing restrictions were extended indefinitely in May 2009 by Reef Fish Amendment 30B (GMFMC 2008). As such, criteria (iii) and (iv) in Section 303(b)(2)(C) have been addressed in Reef Fish Amendments 21 and 30B.

Council Conclusions:

2.2 Action 2: Modification of Prohibitions on Possession of Fish in Madison Swanson and Steamboat Lumps MPAs

Alternative 1: No Action – Possession of Gulf reef fish year-round, or any other species of fish from November through April including coastal migratory pelagic species, is prohibited in the Madison-Swanson and Steamboat Lumps MPAs, except on a vessel in transit with fishing gear stowed. This prohibition does not apply to Atlantic HMS.

Alternative 2: The possession of any species of fish, other than Atlantic HMS, is prohibited year-round in the Madison-Swanson and Steamboat Lumps MPAs, with no exception for vessels in transit.

Alternative 3: The possession of any species of Gulf reef fish is prohibited year-round in the Madison-Swanson and Steamboat Lumps MPAs, with no exception for vessels in transit.

Discussion:

Presently, fishing vessels with fish on board may transit through the boundaries of the Madison-Swanson and Steamboat Lumps MPAs so long as all fishing gear is stowed (**Alternative 1**). This provision allows transiting fishing vessels, including shrimp vessels, to proceed unencumbered between destinations, without the need to reroute to avoid any specific areas, while also potentially being in possession of reef fish. Transiting with gear stowed, which is applicable to Madison and Swanson and Steamboat Lumps, and the Edges, means non-stop progression through the area with fishing gear properly stowed in accordance with 50 CFR 622.34(a)(4)(i-iv). The regulations are listed in Appendix A, including current regulations applicable to HMS. During its October 2019 meeting, the Reef Fish AP heard from a law enforcement representative that enforcement is generally difficult in the MPAs. This assertion was further supported by the U.S. Coast Guard during the Council's October 2019 meeting. The MPAs are slightly larger than 100 square miles each, measuring approximately 10 miles by 10 miles. The relatively small size of the MPAs, and the distance between them (approximately 78.85 miles) and from shore, may mean that they can be avoided by transiting vessels altogether (Figure 1.1.1).

Alternative 2 would prohibit all fishing vessel transit through both MPAs if those vessels have any species of fish on board, other than Atlantic HMS. Prohibiting the possession of most fish species in the MPAs would greatly reduce uncertainty about activities in the MPAs by law enforcement, as any vessels with the prohibited fish aboard in the MPAs would be in violation of the area closure. However, vessels that normally transit through the MPA boundaries would need to expend additional time and fuel to avoid the MPAs. This alternative would not apply to vessels permitted to fish for, retain, possess, or land species managed by NMFS Atlantic HMS, but would apply to other federally managed species, species managed by the states, and any unmanaged species.

Under **Alternative 3**, vessels within or transiting through the Madison-Swanson and Steamboat Lumps MPA boundaries would be prohibited from possessing any species of Gulf reef fish year-round. This alternative differs from **Alternative 2** in that possession of species not managed under the Council's Reef Fish FMP could still be possessed onboard vessels within the MPA boundaries. Examples of exempt species under **Alternative 3** but not under **Alternative 2** include, but are not limited to: those in the FMPs for Shrimp and for Coastal Migratory Pelagic (CMP) Resources in the Gulf and Atlantic Regions, and species managed by the Florida Fish and Wildlife Conservation Commission or the Alabama Marine Resources Division.

Council Conclusions:

CHAPTER 3. AFFECTED ENVIRONMENT

The actions considered in this framework action with associated environmental assessment (EA) would affect fishing in federal waters of the Gulf of Mexico (Gulf). Descriptions of the physical, biological, economic, social, and administrative environments (affected environments) completed in the environmental impact statements (EIS) in the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004a), and the Generic Annual Catch Limits/Accountability Measures (ACL/AM) Amendment (GMFMC 2011a) apply to both the Fishery Management Plan (FMP) for Reef Fish Resources in the Gulf of Mexico (Reef Fish FMP), and the FMP for Coastal Migratory Pelagic (CMP) Resources in the Gulf of Mexico and Atlantic Region (CMP FMP). Descriptions of the affected environments for reef fish and shrimp are further described in Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007), and for reef fish in Reef Fish Amendments 30B (GMFMC 2008), 32 (GMFMC 2011b), 40 (GMFMC 2014), 28 (GMFMC 2015), and 50A (GMFMC 2019). Descriptions of the affected environments for CMP species were most recently completed in CMP Amendments 18 (GMFMC and SAFMC 2011) and 26 (GMFMC and SAFMC 2016). Below, information on each of these environments is summarized or updated, as appropriate. Information on the Atlantic environments is not included herein, as the effects of this framework action are limited to the United States exclusive economic zone (EEZ) in the Gulf.

3.1 Description of the Physical 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 3.1.1). Oceanographic conditions are affected by the Loop Current, discharge of freshwater into the northern Gulf, and a semi-permanent, anti-cyclonic gyre in the western Gulf. The Gulf includes both temperate and tropical waters (McEachran and Fechhelm 2005). Gulf water temperatures range from 54º F to 84º F (12º C to 29º C) depending on time of year and depth of water. Mean annual sea surface temperatures ranged from 73º F through 83º F (23-28º C) including bays and bayous (Figure 3.1.1) between 1982 and 2009, according to satellite-derived measurements (NODC 2012[3]). In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

In general, reef fish and CMP species are widely distributed in the Gulf. Reef fish occupy both pelagic and benthic habitats during their life cycle, while CMP species are found almost exclusively in the pelagic environment. The planktonic larval stage for both species groups lives in the water column and feeds on zooplankton and phytoplankton (GMFMC 2004a). Juvenile and adult reef fish are typically demersal and usually associated with bottom topographies on the continental shelf (less than 100m) which have high relief, i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings. However, several reef fish are also found over sand and soft-bottom substrates. Of the three CMP species (king mackerel, Spanish mackerel, and cobia), cobia most frequently associates

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

with structure; however, all three species spend the majority of their life cycles (larvae, juvenile, and adults) in pelagic habitat.

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.

There are several marine reserves, habitat areas of particular concern (HAPC), and restricted fishing gear areas in the Gulf. These are detailed in GMFMC (2005 and 2018). Included in these are the marine protected areas (MPA) central to this framework action: Madison-Swanson and Steamboat Lumps, which are sited on gag spawning aggregation areas where all fishing except for surface trolling during May through October is prohibited (219 square nautical miles combined). The Bureau of Ocean Energy Management lists historic shipwrecks that occur in the Gulf. Most of these sites are in state or deep (greater than 1,000 feet or 328 meters) waters. There is one site located in federal waters in less than 100 feet (30 meters) that could be affected by fishing for reef fish or CMP species. This is the *U.S.S. Hatteras* located approximately 20 miles (12 kilometers) off Galveston, Texas.

There are environmental sites of special interest that are discussed in the Generic EFH Amendment (GMFMC 2004a) that are relevant to reef fish, CMP, and shrimp management. These include the longline/buoy area closure, the Edges Marine Reserve, Tortugas North and South Marine Reserves, individual reef areas and bank HAPCs of the northwestern Gulf, the Florida Middle Grounds HAPC, the Pulley Ridge HAPC, and Alabama Special Management Zone. These areas are managed with gear restrictions to protect habitat and specific reef fish species. These restrictions are detailed in the Generic EFH Amendment (GMFMC 2004a).

Several area closures, including gear restrictions, may affect targeted and incidental harvest of penaeid shrimp species in the Gulf. These are described in detail in Amendment 13 (GMFMC 2005) and incorporated by reference. Areas such as the Flower Garden Banks and Tortugas North and South Reserves have either incorrect area measurements associated with them (Flower Garden Banks) in Amendment 13 or incorporate state water closures in the total area (Tortugas North and South Reserves). 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

The *Deepwater Horizon* MC252 oil spill in 2010 affected at least one-third of the Gulf area from western Louisiana east to the Florida Panhandle and south to the Campeche Bank in Mexico.

The impacts of the *Deepwater Horizon* MC252 oil spill on the physical environment are expected to be significant and may be long-term. Oil was dispersed on the surface, and because of the heavy use of dispersants (both at the surface and at the wellhead), oil was also documented as being suspended within the water column, some even deeper than the location of the broken well head. Floating and suspended oil washed ashore in several areas of the Gulf as did non-floating tar balls. Whereas suspended and floating oil degrades over time, tar balls are persistent in the environment and can be transported hundreds of miles. For more information on the *Deepwater Horizon* MC252 oil spill,[4] see Section 3.2.3 below.

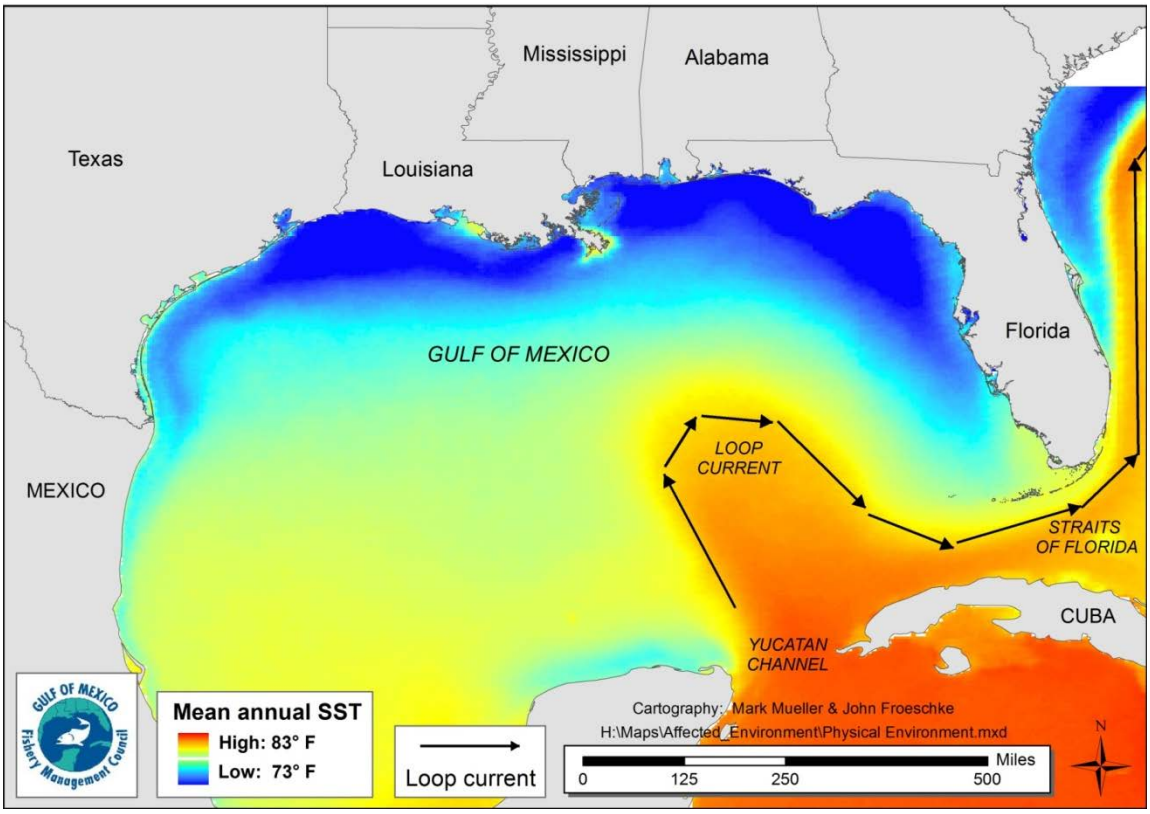

Figure 3.1.1. Physical environment of the Gulf including major feature names and mean annual sea surface temperature as derived from the Advanced Very High-Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (http://accession.nodc.noaa.gov/0072888)

3.2 Description of the Biological/Ecological Environment

The biological environment of the Gulf, is described in detail in the final environmental impact statement for the Generic EFH Amendment (GMFMC 2004a) and is incorporated herein by reference

[4] http://sero.nmfs.noaa.gov/deepwater_horizon_oil_spill.htm

3.2.1 General Information on Reef Fish Species

The National Ocean Service collaborated with the National Marine Fisheries Service (NMFS) and the Gulf of Mexico Fishery Management Council (Council) to develop distributions of reef fish (and other species) in the Gulf (SEA 1998).

Reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. In general, both eggs and larval stages are planktonic. Larval fish feed on zooplankton and phytoplankton. Gray triggerfish are exceptions to this generalization as they lay their eggs in nests on the sandy bottom (Simmons and Szedlmayer 2012), as are gray snapper whose larvae are found around submerged aquatic vegetation.

Status of Reef Fish Stocks

The NMFS Office of Sustainable Fisheries updates its Status of U.S. Fisheries Report to Congress[5] on a quarterly basis utilizing the most current stock assessment information. The Reef Fish FMP currently encompasses 31 species (Table 3.2.1.1). Stock assessments and status determinations have been conducted and designated for 12 stocks and can be found on the Council[6] and the Southeast Data and Review (SEDAR)[7] websites. Of the 12 stocks for which stock assessments have been conducted (Table 3.2.1.1), the first quarter report of the 2020 Status of U.S. Fisheries classifies only one as overfished (greater amberjack), and two stocks as undergoing overfishing (greater amberjack and gray triggerfish).

Stock assessments were conducted for seven reef fish stocks using the Data Limited Methods Toolkit (DLMToolkit; SEDAR 49 2016). This method allows the setting of an overfishing limit (OFL) and acceptable biological catch (ABC) based on limited data and life history information, but does not provide assessment-based status determinations. Several stocks did not have enough information available to complete an assessment even using the DLMToolkit. These stocks are not experiencing overfishing based on annual harvest remaining below the OFL, but no overfished status determination has been made (Table 3.2.1). Lane snapper was the only stock with adequate data to be assessed using the DLMToolkit methods resulting in OFL and ABC recommendations by the Scientific and Statistical Committee (SSC). The remaining species within the Reef Fish FMP have not been assessed at this time. Therefore, whether or not those stocks are overfished is unknown (Table 3.2.1.1). For those species that are listed as not undergoing overfishing, that determination has been made based on the annual harvest remaining below the OFL. No other unassessed species are scheduled for a stock assessment at this time.

[5] http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/status_updates.html
[6] www.gulfcouncil.org
[7] www.sedarweb.org

Table 3.2.1.1. Status of stocks in the Reef Fish FMP grouped by family.

Common Name	Scientific Name	Stock Status		Most recent completed assessment or SSC workshop
		Overfishing	Overfished	
Family Balistidae – Triggerfishes				
gray triggerfish	*Balistes capriscus*	Y	N	SEDAR 43 2015
Family Carangidae – Jacks				
greater amberjack	*Seriola dumerili*	Y	Y	SEDAR 33 Update 2016a
lesser amberjack	*Seriola fasciata*	N	Unknown	SEDAR 49 2016
almaco jack	*Seriola rivoliana*	N	Unknown	SEDAR 49 2016
banded rudderfish	*Seriola zonata*	N	Unknown	-
Family Labridae – Wrasses				
hogfish	*Lachnolaimus maximus*	N	N	SEDAR 37 Update 2017
Family Malacanthidae – Tilefishes				
tilefish (golden)	*Lopholatilus chamaeleonticeps*	N	N	SEDAR 22 2011a
blueline tilefish	*Caulolatilus microps*	N	Unknown	-
goldface tilefish	*Caulolatilus chrysops*	N	Unknown	-
Family Serranidae – Groupers				
gag	*Mycteroperca microlepis*	N	N	SEDAR 33 Update 2016b
red grouper	*Epinephelus morio*	N	N	SEDAR 61 2019
scamp	*Mycteroperca phenax*	Unknown	Unknown	-
black grouper	*Mycteroperca bonaci*	N	N	SEDAR 19 2010
yellowedge grouper	*Hyporthodus flavolimbatus*	N	N	SEDAR 22 2011b
snowy grouper	*Hyporthodus niveatus*	N	Unknown	SEDAR 49 2016
speckled hind	*Epinephelus drummondhayi*	N	Unknown	SEDAR 49 2016
yellowmouth grouper	*Mycteroperca interstitialis*	N	Unknown	SEDAR 49 2016
yellowfin grouper	*Mycteroperca venenosa*	Unknown	Unknown	-
warsaw grouper	*Hyporthodus nigritus*	N	Unknown	-
*Atlantic goliath grouper	*Epinephelus itajara*	N	Unknown	SEDAR 47 2016
Family Lutjanidae – Snappers				
queen snapper	*Etelis oculatus*	N	Unknown	
mutton snapper	*Lutjanus analis*	N	N	SEDAR 15A Update 2015
blackfin snapper	*Lutjanus buccanella*	N	Unknown	-
red snapper	*Lutjanus campechanus*	N	N	SEDAR 52 2018
cubera snapper	*Lutjanus cyanopterus*	N	Unknown	-
gray snapper	*Lutjanus griseus*	N	Unknown	SEDAR 51 2018
lane snapper	*Lutjanus synagris*	N	N	SEDAR 49 2016
silk snapper	*Lutjanus vivanus*	N	Unknown	-
yellowtail snapper	*Ocyurus chrysurus*	N	N	SEDAR 27A 2012
vermilion snapper	*Rhomboplites aurorubens*	N	N	SEDAR 45 2016
wenchman	*Pristipomoides aquilonaris*	N	N	SEDAR 49 2016

Note: *Atlantic goliath grouper is a protected grouper (i.e., ACL is set at zero) and benchmarks do not reflect appropriate stock dynamics.

3.2.2 General Information on Coastal Migratory Pelagic Species

The Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Regions (CMP FMP) currently includes 3 species: the Gulf and Atlantic migratory groups of king mackerel and Spanish mackerel, and the Gulf migratory group of cobia (Table 3.2.2.1).

A description of the biological environment for CMP species is provided in Amendment 18 (GMFMC and SAFMC 2011) and Amendment 26 (GMFMC and SAFMC 2016), and is incorporated herein by reference and summarized below.

Mackerels and cobia are widely distributed in the Gulf, occupying primarily pelagic habitats during their life cycle. In general, both eggs and larval stages are planktonic. Larval fish feed on zooplankton and phytoplankton. Adult migratory behavior can be strongly influenced by water temperature, with mackerels generally remaining in waters warmer than 72 degrees Fahrenheit (22.2 degrees Celsius) (SEDAR 38 2014b, c). Cobia can also exhibit migratory behavior in response to changes in water temperature; however, resident populations of cobia have been observed in single geographic areas year-round (SEDAR 58 2020). As adults, mackerels and cobia largely prey on other finfish, with cobia also preying on crustaceans in nearshore waters.

Status of CMP Stocks

The NMFS Office of Sustainable Fisheries updates its Status of U.S. Fisheries Report to Congress[8] on a quarterly basis utilizing the most current stock assessment information. Stock assessments and status determinations can be found on the Council[9] and SEDAR[10] websites.

Table 3.2.2.1. Status of stocks in the CMP FMP grouped by family.

Common Name	Scientific Name	Stock Status		Most recent completed assessment or SSC workshop
		Overfishing	Overfished	
Family Scombridae – Mackerels				
King mackerel – Gulf	*Scomberomorus cavalla*	N	N	SEDAR 38 2014b
Spanish mackerel – Gulf	*Scomberomorus maculatus*	N	N	SEDAR 28 2013b
Family Rachycentridae – Cobia				
Cobia – Gulf	*Rachycentron canadum*	N	N	SEDAR 28 2013c

[8] http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/status_updates.html
[9] www.gulfcouncil.org
[10] www.sedarweb.org

3.2.3 Other General Information on Gulf Reef Fish and Other CMP Species

Bycatch

Bycatch is defined as fish harvested in a fishery, but not sold or retained for personal use. This definition includes both economic and regulatory discards, and excludes fish released alive under a recreational catch-and-release fishery management program. Economic discards are generally undesirable from a market perspective because of their species, size, sex, and/or other characteristics. Regulatory discards are fish required by regulation to be discarded, but also include fish that may be retained but not sold. Bycatch practicability analyses of the reef fish fishery have been provided in several reef fish amendments (GMFMC 2007, GMFMC 2014, GMFMC 2015), and for CMP species most recently in GMFMC and SAFMC (2016). Generally, positive biological impacts would be associated with further reducing bycatch in reef fish fisheries. Reducing discards and discard mortality rates would result in less forgone yield. Based on previous actions and management measures, the actions in this framework action will to the extent practicable, further minimize bycatch in the Reef Fish FMP. Concurrently, the actions in this framework action are not expected to significantly increase or decrease the magnitude of bycatch or bycatch mortality in the CMP fishery. Both sectors of the CMP fishery have relatively low baseline levels of bycatch, which are not expected to change as a result of implementation of this framework action. No additional action is needed to further minimize bycatch in the CMP fishery.

Protected Species

The Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) provide special protections to some species that occur in the Gulf. A brief summary of these two laws and more information is available on the NMFS Office of Protected Resources website[11]. All 22 marine mammals in the Gulf are protected under the MMPA. Three marine mammals (sperm whales, Gulf of Mexico Bryde's whales, and manatees) are also protected under the ESA. Gulf of Mexico Bryde's whales are the only resident baleen whales in the Gulf and the species was recently listed as endangered (84 FR 15446; April 15, 2019). Other species protected under the ESA include sea turtle species (Kemp's ridley, loggerhead (Northwest Atlantic Ocean distinct population segment [DPS]), green (South Atlantic and North Atlantic DPSs), leatherback, and hawksbill), five fish species (Gulf sturgeon, smalltooth sawfish, Nassau grouper, giant manta ray, and oceanic whitetip shark), and four coral species (elkhorn, lobed star, mountainous star, and boulder star). Critical habitat designated under the ESA for smalltooth sawfish, Gulf sturgeon, and the Northwest Atlantic Ocean DPS of loggerhead sea turtles also occurs in the Gulf, though only loggerhead critical habitat occurs in federal waters.

Reef Fish Fishing Activity

The most recent biological opinion (opinion) on the Reef Fish FMP was completed on September 30, 2011 (NMFS 2011). The opinion determined the continued authorization of the

[11] https://www.fisheries.noaa.gov/protecting-marine-life

Gulf reef fish fishery managed under the Reef Fish FMP is not likely to affect ESA-listed marine mammals or Acropora corals, and is not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback), or smalltooth sawfish. An incidental take statement was provided. Since issuing the opinion, in memoranda dated September 16, 2014, and October 7, 2014, NMFS concluded that the activities associated with the Reef Fish FMP are not likely to adversely affect critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle DPS or four newly listed species of corals (rough cactus, lobed star, mountainous star, and boulder star).

On April 6, 2016, NMFS and the U.S. Fish and Wildlife Service published a final rule (81 FR 20057) removing the range-wide and breeding population ESA-listings of the green sea turtle and listing eight DPSs as threatened and three DPSs as endangered, effective May 6, 2016. Two of the green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, occur in the Gulf and are listed as threatened. In addition, on June 29, 2016, NMFS published a final rule (81 FR 42268) listing Nassau grouper as threatened under the ESA. NMFS has reinitiated consultation on the FMP to address these listings. In a memorandum dated September 29, 2016, NMFS determined that allowing fishing under the Reef Fish FMP to continue during the re-initiation period is not likely to jeopardize the continued existence of the North Atlantic and South Atlantic DPSs of green sea turtles or Nassau grouper. Furthermore, on January 22, 2018, NMFS published a final rule (83 FR 2916) listing the giant manta ray as threatened under the ESA. On January 30, 2018, NMFS published a final rule (83 FR 4153) listing the oceanic whitetip shark as threatened under the ESA. In a memorandum dated March 6, 2018, NMFS revised the reinitiated consultation on the Reef Fish FMP to address the listings of the giant manta and oceanic whitetip and determined that allowing fishing under the Reef Fish FMP to continue during the revised re-initiation period is not likely to jeopardize the continued existence of listed sea turtle species, smalltooth sawfish, the green turtle DPSs, Nassau grouper, the giant manta, or the oceanic whitetip. Since the revised request for reinitiation of consultation, NMFS determined that the newly listed Gulf of Mexico Bryde's whale may be affected by fishing managed under the Reef Fish FMP in a June 20, 2019, memorandum. In that same June 20, 2019, memorandum, NMFS concluded that the activities associated with the Reef Fish FMP were not likely to jeopardize the continued existence of the Bryde's whale during the revised reinitiation period.

There is no information to indicate marine mammals and birds rely on reef fish for food, and they are not generally caught by fishers harvesting reef fish. Primary gear types used in the Gulf reef fish fishery are classified in the Final List of Fisheries for 2020 (84 FR 54543) as Category III gear. This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to one percent of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock, while allowing that stock to reach or maintain its optimum sustainable population. Additionally, there is no evidence that the directed reef fish fishery is adversely affecting seabirds.

CMP Fishing Activity

In a 2015 biological opinion (BiOp), NMFS determined CMP fishing in the Southeastern United States was not likely to jeopardize the continued existence of endangered sea turtles, Atlantic sturgeon, or smalltooth sawfish (NMFS 2015). Other listed species are not likely to be adversely affected, including ESA-listed whales, Gulf sturgeon, smalltooth sawfish, and corals. In addition, the CMP fishery is not likely to adversely affect designated critical habitats for elkhorn and staghorn corals or loggerhead sea turtles.

On January 22, 2018, NMFS published a final rule (83 FR 2916) listing the giant manta ray as threatened under the ESA. On January 30, 2018, NMFS published a final rule (83 FR 4153) listing the oceanic whitetip shark as threatened under the ESA. In a memorandum dated June 11, 2018, NMFS reinitiated consultation on the CMP FMP to address the listings of the giant manta ray and oceanic whitetip shark. The consultation memo determined that allowing fishing under the CMP FMP to continue during the re-initiation period is not likely to adversely affect oceanic whitetip sharks and will not appreciably reduce the likelihood of the giant manta ray's survival or recovery within its range.

On April 6, 2016, NMFS and the U.S. Fish and Wildlife Service published a final rule (81 FR 20057) removing the range-wide and breeding population ESA-listings of the green sea turtle and listing eight DPSs as threatened and three DPSs as endangered, effective May 6, two of the green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, overlap with the CMP fishery. In addition, on June 29, 2016, NMFS published a final rule (81 FR 42268) listing Nassau grouper as threatened under the ESA. In a memorandum dated November 18, 2017, NMFS amended the 2015 biological opinion to address these new listings. The amendment determined that the continued authorization of the CMP fishery is not likely to jeopardize the continued existence of green sea turtles (North Atlantic DPS or South Atlantic DPS), and is not likely to adversely affect Nassau grouper.

On April 15, 2019 (84 FR 15446) NMFS published a final listing rule for the Gulf of Mexico Bryde's whale. The rule lists Gulf of Mexico Bryde's whale as endangered and lists the fishing gear entanglement as a threat to this species. In a memorandum dated July 08, 2019, NMFS amended the reinitiation request to include this newly listed species and determined that allowing the continued authorization of the CMP fishery during the reinitiation period will not violate Section 7(a)(2) or 7(d).

The Gulf and South Atlantic CMP hook-and-line fishery is classified in the 2020 MMPA List of Fisheries as a Category III fishery (84 FR 54543), meaning the annual mortality and serious injury of a marine mammal resulting from the fishery is less than or equal to 1% of the maximum number of animals, not including natural moralities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The Gulf and South Atlantic CMP gillnet fishery is classified as a Category II fishery in the 2020 MMPA List of Fisheries. This classification indicates an occasional incidental mortality or serious injury of a marine mammal stock resulting from the fishery (1-50% annually of the potential biological removal). The fishery has no documented interaction with marine mammals; NMFS classifies this fishery as Category II based on analogy (i.e., similar risk to marine mammals) with other gillnet fisheries.

Climate Change

Climate change projections predict increases in sea-surface temperature and sea level; decreases in sea-ice cover; and changes in salinity, wave climate, and ocean circulation (Intergovernmental Panel on Climate Change [IPCC]).[12] These changes are likely to affect plankton biomass and fish larvae abundance that could adversely impact fish, marine mammals, seabirds, and ocean biodiversity. Kennedy et al. (2002) and Osgood (2008) have suggested global climate change could affect temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; change precipitation patterns and cause a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influence the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs. The National Oceanic and Atmospheric Association (NOAA) Climate Change Web Portal[13] predicts the average sea surface temperature in the Gulf will increase by approximately 2ºC for 2006-2100 compared to the average over the years 1956-2005. For reef fishes, Burton (2008) speculated climate change could cause shifts in spawning seasons, changes in migration patterns, and changes to basic life history parameters such as growth rates. It is unclear if reef fish distribution in the Gulf and South Atlantic has been affected. The smooth puffer and common snook are examples of species for which there has been a distributional trend to the north in the Gulf. For other species, such as red snapper and the dwarf sand perch, there has been a distributional trend towards deeper waters. For additional fish species, such as the dwarf goatfish, there has been a distributional trend both to the north and to deeper waters. These changes in distributions have been hypothesized as a response to environmental factors such as increases in temperature.

The distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms. Hollowed et al. (2013) provided a review of projected effects of climate change on the marine fisheries and dependent communities. Integrating the potential effects of climate change into the fisheries assessment is currently difficult due to the time scale differences (Hollowed et al. 2013). The fisheries stock assessments rarely project through a time span that would include detectable climate change effects.

Greenhouse gases

The IPCC has indicated greenhouse gas emissions are one of the most important drivers of recent changes in climate. Wilson et al. (2014) inventoried the sources of greenhouse gases in the Gulf from sources associated with oil platforms and those associated with other activities such as fishing. A summary of the results of the inventory are shown in Table 3.2.3.1 with respect to total emissions and from fishing. Commercial fishing and recreational vessels make up a small percentage of the total estimated greenhouse gas emissions from the Gulf (2.04% and 1.67%, respectively).

[12] http://www.ipcc.ch/
[13] https://www.esrl.noaa.gov/psd/ipcc/

Table 3.2.3.1. Total Gulf greenhouse gas 2014 emissions estimates (tons per year [tpy]) from oil platform and non-oil platform sources, commercial fishing, and percent greenhouse gas emissions from commercial fishing vessels of the total emissions*.

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

*Compiled from Tables 6-11, 6-12, and 6-13 in Wilson et al. (2014). **The CO_2 equivalent (CO_2e) emission estimates represent the number of tons of CO_2 emissions with the same global warming potential as one ton of another greenhouse gas (e.g., CH_4 and N_2O). Conversion factors to CO_{2e} are 21 for CH_4 and 310 for N_2O.

Deepwater Horizon MC252 Oil Spill

General Impacts on Fishery Resources

The presence of polycyclic aromatic hydrocarbons (PAH), which are highly toxic chemicals that tend to persist in the environment for long periods of time, in marine environments can have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2012). When exposed to realistic, yet toxic levels of PAHs (1–15 µg/L), greater amberjack larvae develop cardiac abnormalities and physiological defects (Incardona et al. 2014). The future reproductive success of long-lived species, including red drum (*Sciaenops ocellatus*) and many reef fish species, may be negatively affected by episodic events resulting in high-mortality years or low recruitment. These episodic events could leave gaps in the age structure of the population, thereby affecting future reproductive output (Mendelssohn et al. 2012). Other studies have described the vulnerabilities to oil spills and dispersants of various marine finfish species, with morphological and/or life history characteristics similar to species found in the Gulf (Hose et al. 1996; Carls et al. 1999; Heintz et al. 1999; Short 2003).

Increases in histopathological lesions were found in red snapper in the area affected by the oil, but Murawski et al. (2014) found that the incidence of lesions had declined between 2011 and 2012. The occurrence of such lesions in marine fish is not uncommon (Sindermann 1979; Haensly et al. 1982; Solangi and Overstreet 1982; Khan and Kiceniuk 1984, 1988; Kiceniuk and Khan 1987; Khan 1990). Red snapper diet was also affected after the spill. A decrease in zooplankton consumed, especially by adults (greater than 400 mm total length) over natural and artificial substrates may have contributed to an increase in the consumption of fish and invertebrate prey – more so at artificial reefs than natural reefs (Tarnecki and Patterson 2015).

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 well head (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted until the *Deepwater Horizon* MC252 oil spill. Thus, no data exist on the environmental fate of dispersants in deep water. The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern. Marine fish species typically concentrate PAHs in the digestive tract, making stomach bile an appropriate testing medium. A study by Synder et al. (2015) assessed bile samples from golden tilefish (*Lopholatilus chamaeleonticeps*), king snake eel (*Ophichthus rex*), and red snapper for PAH accumulation over time, and reported concentrations were highest in golden tilefish during the same time period when compared to king snake eel and red snapper. These results suggest that the more highly associated an organism is with the sediment in an oil spill area, the higher the likelihood of toxic PAH accumulation. 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). Another study found that while Corexit 9500A® and oil are similar in their toxicity, when Corexit 9500A® and oil were mixed in lab tests, toxicity to microscopic rotifers increased up to 52-fold (Rico-Martínez et al. 2013). These studies suggest that the toxicity of the oil and dispersant combined may be greater than anticipated.

As reported by NOAA's Office of Response and Restoration (NOAA 2010), the oil from the *Deepwater Horizon* MC252 spill is relatively high in alkanes, which can readily be used by microorganisms as a food source. As a result, the oil from this spill is likely to biodegrade more readily than crude oil in general. The *Deepwater Horizon* MC252 oil is also relatively much lower in PAH, especially if the spilled oil penetrates into the substrate on beaches or shorelines. Like all crude oils, MC252 oil contains volatile organic compounds (VOC) such as benzene, toluene, and xylene. Some VOCs are acutely toxic but, because they evaporate readily, they are generally a concern only when oil is fresh.

Outstanding Effects

As a result of the *Deepwater Horizon* MC252 oil spill, a consultation pursuant to ESA Section 7(a)(2) was reinitiated. As discussed above, on September 30, 2011, the Protected Resources Division released an opinion, which after analyzing best available data, the current status of the species, environmental baseline (including the impacts of the recent *Deepwater Horizon* MC252 oil spill in the northern Gulf), effects of the proposed action, and cumulative effects, concluded that the continued operation of the Gulf reef fish fishery is not likely to jeopardize the continued existence of green, hawksbill, Kemp's ridley, leatherback, or loggerhead sea turtles, nor the continued existence of smalltooth sawfish (NMFS 2011). More information is available on the *Deepwater Horizon* MC252 oil spill and associated closures is available on the Southeast Regional Office website[14].

[14] http://sero.nmfs.noaa.gov/deepwater_horizon_oil_spill.htm

NMFS analyzed the best available data, the current status of the species, the environmental baseline (including the impacts of the Deepwater Horizon MC252 oil spill in the northern Gulf), the effects of the proposed action, and cumulative effects and determined that the CMP fishery is not likely to jeopardize the continued existence of loggerhead (the NWA DPS) or green (both the Florida breeding population and non-Florida breeding population, as well as the proposed North Atlantic DPS) sea turtles. NMFS also concluded that the fishery is not likely to jeopardize the continued existence of Kemp's ridley, hawksbill, or leatherback sea turtles, Atlantic sturgeon (GM, NYB, CB, Carolina, or SA DPSs), or smalltooth sawfish (U.S. DPS) (NMFS 2015).

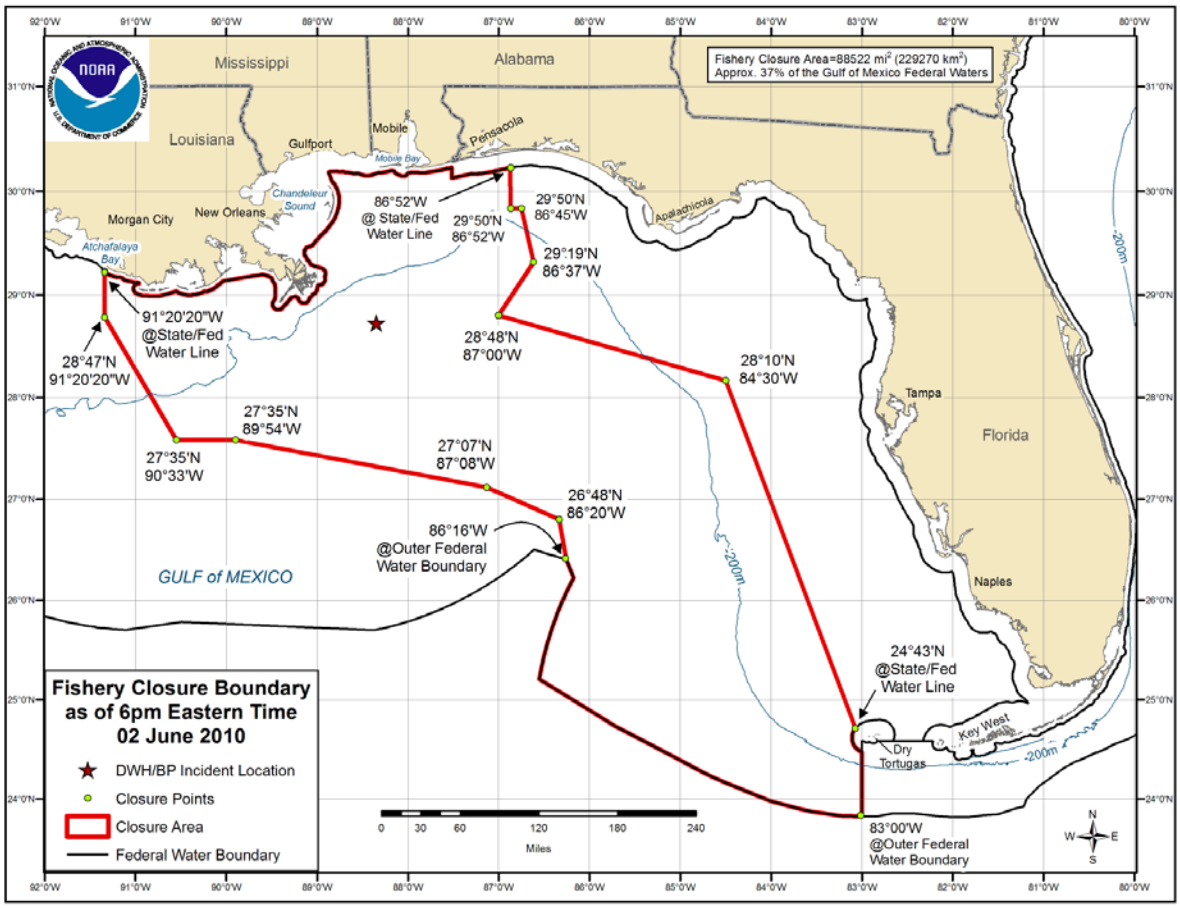

Figure 3.2.3.1. Fishery closure at the height of the *Deepwater Horizon* MC252 oil spill.

3.2.4 General Information on Gulf Shrimp

A complete description of the biological environment for Gulf shrimp species can be found in Amendment 17B (GMFMC 2017) and is incorporated herein by reference.

Brown, white, and pink shrimp use a variety of habitats as they grow from planktonic larvae to spawning adults (GMFMC 1981b). 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).

The life history of royal red shrimp is poorly understood. Royal red shrimp occur exclusively in the EEZ, live longer than penaeid shrimp, and many year classes may be present on fishing grounds at one time. 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 (Reed and Farrington 2010). Royal red shrimp decrease in size with 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).

3.2.5 General Information on Atlantic Highly Migratory Species (HMS)

Atlantic HMS include Atlantic tunas, sharks, swordfish and billfish. The actions presented in this framework action do not propose any regulatory changes affecting the management of Atlantic HMS. The following is a summary of habitats comprising EFH of Atlantic HMS target species and bluefin tuna, originally published in the 2006 Consolidated Atlantic HMS FMP and updated in Amendment 10 to the 2006 Consolidated Atlantic HMS FMP[15]. Chapter 6 of Amendment 10 includes a description and summary of known information regarding the life history, migratory behavior, distribution, habitat use and associations (including EFH text descriptions), stock structure, and predator-prey relationships for 53 managed species of Atlantic HMS. Maps describing EFH for multiple life stages and Habitat Areas of Particular Concern (i.e., bluefin tuna, sandbar shark, lemon shark, sand tiger shark) are also presented in this amendment and are not repeated here. Fishery and stock status information are available in the most recent version of the Atlantic HMS Stock Assessment and Fishery Evaluation (SAFE) report[16].

[15] https://www.fisheries.noaa.gov/action/amendment-10-2006-consolidated-hms-fishery-management-plan-essential-fish-habitat
[16] https://www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-stock-assessment-and-fisheries-evaluation-reports

3.3 Description of the Economic Environment

3.3.1 Commercial Sector

From 2009 through 2019, a total of 168 commercial fishing vessels were detected within the MPAs. Most of those commercial vessels were permitted to harvest reef fish, and the others were permitted to harvest shrimp and Atlantic HMS. The following provides brief economic descriptions of the commercial sectors of the reef fish, CMP, and shrimp fisheries, with more emphasis on permitted vessels that harvest reef fish.

Reef Fish

Thirty-one species are managed under the Gulf Reef Fish FMP, and a vessel must have a limited-access commercial reef fish permit to harvest and sell those species from the Gulf EEZ. Moreover, any vessel that harvests reef fish under the permit must also have an operating vessel monitory system (VMS) on board (50 CFR §622.28). An owner or operator of a vessel must ensure that the required VMS unit transmits a signal indicating the vessel's accurate position at least once an hour, 24 hours a day every day when out of port or in port and not in dry dock.

The reef fish permit, however, is not sufficient to harvest red snapper or Gulf groupers-tilefishes[20] that are managed under individual fishing quota (IFQ) programs. For a person aboard a vessel, for which a commercial vessel permit for Gulf reef fish has been issued, to fish for, possess, or land Gulf red snapper, regardless of where harvested or possessed, a Gulf IFQ vessel account for Gulf red snapper must have been established (50 CFR §622.21(b)(1)). For a person aboard a vessel, for which a commercial vessel permit for Gulf reef fish has been issued, to fish for, possess, or land Gulf deep-water grouper (DWG), red grouper, gag, other shallow water grouper (SWG) or tilefishes, regardless of where harvested or possessed, a Gulf IFQ vessel account for the applicable species or species groups must have been established (50 CFR §622.22(b)(1)). More information about the two IFQ programs can be found in recent Gulf of Mexico Red Snapper Individual Fishing Quota Annual Reports[21] and the Grouper-Tilefish Individual Fishing Quota Program 5-Year Review.[22]

From 2014 through 2018, an average of approximately 65% of vessels with a commercial reef permit reported landings of reef fish and approximately 59% reported landings of IFQ species (Table 3.3.1.1). In 2019, 842 vessels had the permit, 485 (58%) had reef fish landings, and 448 (53%) had landings of IFQ species. As of May 6, 2020, a total of 827 vessels had a reef fish permit.

For a person aboard a vessel, for which a valid commercial vessel permit for Gulf reef fish has been issued, to use a bottom longline for Gulf reef fish in the Gulf EEZ east of 85°30 W. long., a valid eastern Gulf reef fish bottom longline endorsement must have been issued to the vessel and

[20] Grouper-Tilefishes: gag grouper, red grouper, deep-water grouper (snowy grouper, speckled hind, warsaw grouper, yellowedge grouper), other shallow-water grouper (black grouper, scamp, yellowfin grouper, yellowmouth grouper), and tilefishes (blueline tilefish, golden tilefish, goldface tilefish).
[21] https://portal.southeast.fisheries.noaa.gov/reports/cs/RS_AnnualReport_SEROfinal.pdf
[22] https://gulfcouncil.org/wp-content/uploads/1-Grouper-Tilefish-IFQ-Review.pdf

must be on board (50 CFR §622.20(2)). From 2014 through 2018 there was an annual average of 62 vessels with the endorsement and 98.4% of them were held by entities residing in Florida. As of May 21, 2020, there are 61 endorsements; 59 of those endorsements are held by entities in Florida and the other two are held by entities residing in Texas.

Table 3.3.1.1. Number of vessels with reef fish (RF) permit, number and percentage with RF landings, and number and percentage with landings of IFQ species, 2014 – 2018.

Year	Permitted Vessels	Permitted Vessels with RF Landings	Percent Permitted Vessels with RF Landings	Permitted Vessels with Landings IFQ Species	Percent Permitted Vessels with Landings IFQ Species
2014	882	576	65.3%	507	57.5%
2015	868	547	63.0%	495	57.0%
2016	852	538	63.1%	491	57.6%
2017	850	565	66.5%	517	60.8%
2018	845	548	64.9%	508	60.1%
Average	859	555	64.6%	504	58.6%

Source: SERO SFD Permit Counts for historical number of permits (May 6, 2020) and SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020) for permitted vessels with reported RF landings.

Dockside revenue from landings of reef fish accounts for the large majority of dockside revenue from all species landed by permitted vessels. From 2014 through 2018, dockside revenue from reef fish landings represented, on average, approximately 96% of dockside revenue from all landings by permitted vessels by value (Table 3.3.1.2). Dockside revenue from reef fish landings represent from approximately 88% of all dockside revenue for the average permitted vessel that reports reef fish landings in Alabama and 98.8% of all dockside revenue for the average permitted vessel that reports reef fish landings in Texas (Table 3.3.1.3).

Table 3.3.1.2. Nominal dockside revenue from reef fish landings and all species landings and percentage of all dockside revenue from RF landings, 2014 - 2018.

Year	Dockside Revenue from RF Landings	Dockside Revenue from All Landings	Percentage from RF Landings
2014	$59,706,647	$62,995,388	94.8%
2015	$61,756,815	$64,455,444	95.8%
2016	$61,498,530	$64,597,746	95.2%
2017	$57,155,680	$59,788,442	95.6%
2018	$54,704,667	$56,798,222	96.3%
Average			95.5%

Source: SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

Table 3.3.1.3. Average annual percent of dockside revenue from reef fish landings by state, 2014 - 2018.

AL	FL	LA	MS	TX
88.1%	95.3%	97.2%	97.9%	98.8%

Source: SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

Trips with reef fish landings comprise approximately 89% of all trips made by the permitted vessels that report reef fish landings annually (Table 3.3.1.4). On average, the 555 permitted vessels with reef fish landings annually make 12 trips to obtain those landings. However, there are substantial differences across the states. The average Mississippi vessel makes 45 trips that land reef fish annually, while the average Alabama vessel makes 11 trips that land reef fish annually (Table 3.3.1.5). Collectively Florida vessels make up 77.4% of all annual trips with reef fish landings, while Mississippi vessels account for 3.2% of those annual trips (Table 3.3.1.5).

Table 3.3.1.4. Trips with reef fish landings, total trips and percentage of total trips made by vessels with RF landings, and average number of trips per permitted vessel with RF landings, 2014 - 2018.

Year	Trips with RF Landings	All Trips	Percent of All Trips with RF Landings	Vessels with RF Landings	Ave Trips with RF Landings per Vessel
2014	6,986	7,996	87.4%	576	12
2015	7,009	7,794	89.9%	547	13
2016	7,130	7,960	89.6%	538	13
2017	6,832	7,636	89.5%	565	12
2018	5,992	6,636	90.3%	548	11
Average	6,790	7,604	89.3%	555	12

Source: SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

Table 3.3.1.5. Average annual number of trips with reef fish landings per permitted vessel and average percentage of total trips by state, 2014 - 2018.

Year	AL	FL	LA	MS	TX	Total
2014	9	12	12	44	11	87
2015	10	12	15	34	11	82
2016	13	12	14	46	13	99
2017	14	11	15	48	12	100
2018	10	10	13	53	12	99
Average	11	12	14	45	12	93
Percentage	4.8%	77.4%	7.3%	3.2%	7.3%	100.0%

Source: SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

There are considerable differences in reef fish landings by state. From 2014 through 2018, an annual average of approximately 66% (9.5 million pounds gutted weight [mp gw]) of reef fish harvested by permitted vessels were landed in Florida (Table 3.3.1.6). The approximately 2.5 mp gw (17%) landed annually in Texas ranks second, followed in turn by Louisiana with approximately 13%, Alabama with approximately 3%, and Mississippi with approximately 1% of reef fish landings by permitted vessels.

Table 3.3.1.6. Reef fish landings (lbs gw) and average percentage of total reef fish landings reported by permitted vessels by state, 2014 - 2018.

Year	AL	FL	LA	MS	TX	Total
2014	301,479	11,230,752	1,627,250	159,860	2,140,381	15,459,722
2015	372,541	10,059,081	2,036,785	240,984	2,685,345	15,394,736
2016	343,413	9,957,165	1,896,010	169,466	2,760,928	15,126,982
2017	471,410	8,793,701	1,918,094	176,665	2,505,415	13,865,285
2018	365,242	7,707,928	1,771,348	178,403	2,443,042	12,465,963
Average	370,817	9,549,725	1,849,897	185,076	2,507,022	14,462,538
Percentage	2.6%	65.8%	12.9%	1.3%	17.4%	100.0%

Source: SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

Electric hook-and-line (bandit) gear and bottom longline are the most popular gears to harvest reef fish. From 2014 through 2018, those two gears collectively accounted for an average of 86.3% of all reef fish landings: 55.0% from bandit and 31.3% by bottom longline (Figure 3.3.1.1). Hand hook-and-line gear accounted for approximately 12.0% and divers (spear and power) accounted for 1.2% of all reef fish landings. Remaining gears (buoy hook-and-line, trolling hook-and-line, and other) accounted for the remaining 0.5% of reef fish landings.

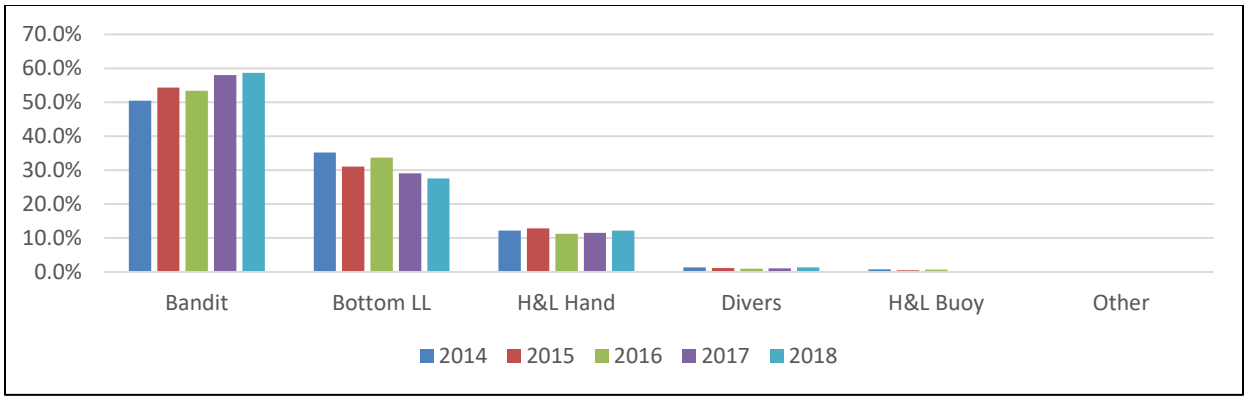

Figure 3.3.1.1. Percentage of total reef fish landings (lbs gw) by gear used, 2014 – 2018. Source: SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

Dealers who purchase reef fish harvested from the EEZ must have a Gulf and South Atlantic dealer permit, which is an open-access permit. To obtain a dealer permit, the applicant must have a valid state wholesaler's license in the state(s) where the dealer operates. As of May 21, 2020, there were 385 dealers with a Gulf and South Atlantic dealer permit and 67.8% of them were located in a Gulf state (Table 3.3.1.7).

Table 3.3.1.7. Number of dealers with Gulf and SA dealer permit by state as of May 21, 2020.

State	Number with Dealer Permits	Percentage of Dealers
AL	11	2.9%
FL	215	55.8%
LA	20	5.2%
MS	3	0.8%
TX	12	3.1%
Gulf States	261	67.8%
Other	124	32.2%
Total	385	100.0%

Source: NMFS SERO Permits Freedom of Information (FOIA) webpage as of May 21, 2020.

The reef fish fishery generates jobs and income, sales, and value-added impacts to the U.S. economy. As shown in Table 3.3.1.8, an annual average of 7,840 jobs and approximately $223 million in income (2018 dollars) was generated by the fishery from 2014 through 2018.

Table 3.3.1.8. Average annual economic impacts of reef fish fishery, 2014 – 2018.

Average Annual Dockside Revenue (2018 dollars)	Jobs	Income (thousands of of 2018 dollars)	Sales (thousands of of 2018 dollars)	Value-Added (thousands of of 2018 dollars)
$61,233,493	7,840	$223,000	$607,241	$315,073

Source: NMFS SERO using the model developed for and applied in NMFS (2014).

More information about the economics of the commercial sector of the reef fish fishery can be found in Amendments 47 and 51 (GMFMC 2017, 2019) to the FMP and Overstreet and Liese (2018) and are incorporated by reference.

Coastal Migratory Pelagic Species

Three species (cobia, king mackerel and Spanish mackerel) are managed under the Gulf and South Atlantic Coastal Migratory Species FMP. There is no federal permit required for the commercial harvest of Gulf cobia; however, a limited-access king mackerel permit and open-access Spanish mackerel are required to harvest the respective species in the Gulf and South Atlantic EEZ. For a person aboard a vessel to use a run-around gillnet for king mackerel in the Gulf southern zone, a limited-access eastern Gulf king mackerel gillnet permit must also have been issued to the vessel and must be on board (50 CFR §622.370(a)(2)).

Vessels with a valid federal commercial vessel permit that harvest Gulf cobia in the EEZ, such as those with a king or Spanish mackerel permit, may only sell or transfer those fish to dealers with a federal dealer permit. There is no requirement that a vessel operating under either a king or Spanish mackerel permit has to have an operating VMS onboard.

From 2014 through 2018, an annual average of approximately 19% of vessels with a king mackerel permit reported landings of king mackerel from the Gulf and approximately 8% of vessels with a Spanish mackerel permit reported landings of Spanish mackerel from the Gulf (Tables 3.3.1.9 and 3.3.1.10). As of May 6, 2020, there were 1,418 vessels with a king mackerel permit and 1,794 vessels with a Spanish mackerel permit.

From 2014 through 2018, an annual average of 66% of the vessels with a Gulf king mackerel gillnet permit reported landings of king mackerel (Table 3.3.1.11). As of May 21, 2020, there were 17 vessels with an eastern Gulf gillnet permit. Note that all of the gillnet permits are held by entities residing in Florida and all of these landings occurred in Florida.

Table 3.3.1.9. Number of vessels with king mackerel (KM) permit, and number and percentage with KM landings, 2014 – 2018.

Year	Vessels with KM Permit	Permitted KM Vessels with KM Landings in Gulf State	Percent Permitted KM Vessels with KM Landings
2014	1,478	288	19.5%
2015	1,460	264	18.1%
2016	1,451	259	17.8%
2017	1,445	299	20.7%
2018	1,440	254	17.6%
Average	1,455	273	18.7%

Source: SERO SFD Permit Counts for historical number of permits (May 6, 2020) and SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

Table 3.3.1.10. Number of vessels with Spanish mackerel (SM) permit, and number and percentage with SM landings, 2014 – 2018.

Year	Vessels with SM Permit	Permitted SM Vessels with SM Landings	Percent Permitted SM Vessels with SM Landings
2014	2,156	170	7.9%
2015	2,231	180	8.1%
2016	2,281	185	8.1%
2017	2,318	178	7.7%
2018	2,397	155	6.5%
Average	2,277	174	7.6%

Source: SERO SFD Permit Counts for historical number of permits (May 6, 2020) and SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

Table 3.3.1.11. Number of vessels with Gulf KM gillnet permit, and number and percentage with KM landings, 2014 – 2018.

Year	Vessels with KM Gillnet Permit	Permitted KM Gillnet Vessels with KM Landings	Percent Permitted KM Gillnet Vessels with KM Landings
2014	23	14	60.9%
2015	22	12	54.5%
2016	21	12	57.1%
2017	20	15	75.0%
2018	17	14	82.4%
Average	21	13	66.0%

Dockside revenue from landings of king mackerel accounts for the large majority of dockside revenue from all species landed by permitted vessels in the Gulf states. From 2014 through 2018, dockside revenue from king mackerel landings represented, on average, approximately 24% of dockside revenue from revenue from all landings by permitted vessels by value (Table 3.3.1.12). Similarly, during that 5-year period, dockside revenue from Spanish mackerel accounted for, on average, approximately 2% of dockside revenue from all landings (Table 3.3.1.13). Dealers who purchase king or Spanish mackerel harvested from the EEZ must have a Gulf and South Atlantic dealer permit.

Table 3.3.1.12. Nominal dockside revenue from KM landings in the Gulf states and all species landings and percentage of all dockside revenue from KM landings in Gulf states, 2014 - 2018.

Year	Dockside Revenue from KM Landings	Dockside Revenue from All Landings	Percentage from KM Landings
2014	$5,645,486	$23,063,923	24.5%
2015	$4,602,025	$23,033,035	20.0%
2016	$5,116,600	$25,512,087	20.1%
2017	$5,687,478	$25,034,998	22.7%
2018	$6,031,762	$19,340,585	31.2%
Average	$5,416,670	$23,196,926	23.7%

Source: SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

Table 3.3.1.13. Nominal dockside revenue from SM landings in Gulf states and all species landings and percentage of all dockside revenue from SM landings in Gulf states, 2014 - 2018.

Year	Dockside Revenue from SM Landings	Dockside Revenue from All Landings	Percentage from SM Landings
2014	$281,931	$12,279,420	2.3%
2015	$333,815	$9,712,233	3.4%
2016	$321,373	$11,586,766	2.8%
2017	$110,373	$12,780,261	0.9%
2018	$87,786	$8,389,513	1.0%
Average	$227,056	$10,949,639	2.1%

Source: SEFSC Socioeconomic Panel (Version 10) accessed by the SEFSC Economic Query System (March 30, 2020).

From 2014 through 2018, the coastal migratory pelagic resources fishery within the Gulf generated an annual average of 755 jobs and approximately $21.5 million in income (2018 dollars).

Table 3.3.1.14. Average annual economic impacts of coastal migratory pelagic resources fishery within Gulf, 2014 – 2018.

Average Annual Dockside Revenue (2018 dollars)	Jobs	Income (thousands of of 2018 dollars)	Sales (thousands of of 2018 dollars)	Value-Added (thousands of of 2018 dollars)
$5,971,010	755	$21,520	$59,391	$30,564

Source: NMFS SERO using the model developed for and applied in NMFS (2014).

More information about the economics of the coastal migratory species fishery can be found in Framework Amendments 5, 6, 7, and 8 to the FMP for Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region (GMFMC 2016, South Atlantic FMC (SAFMC) 2018, GMFMC 2019, SAFMC 2020) and is incorporated by reference.

Shrimp

Four species of shrimp are managed under the Gulf Shrimp FMP: royal red, pink, white and brown shrimp. For a person aboard a vessel to fish for or possess those shrimp in or from the Gulf EEZ, a limited-access commercial vessel moratorium permit for Gulf shrimp must have been issued to the vessel and must be on board. In addition, a Gulf royal red shrimp endorsement, which is an open-access permit for those holding a Gulf of Mexico Shrimp Commercial Fishing Permit (SPGM), is also required for harvesting royal red shrimp in the Gulf EEZ. A vessel with a SPGM must carry a NMFS-approved observer if the vessel's trip is selected for observer coverage.

In accordance with the procedures specified in the Gulf Shrimp FMP all commercial vessel moratorium permits for Gulf shrimp have been issued. No additional permits will be issued. The number of moratorium permits declined from 1,501 in 2014 to 1,426 in 2018 (NMFS SERO Permit Counts); and as of May 19, 2020, there were 1,393 moratorium permits (NMFS SERO Permits FOIA website). There is no requirement that a vessel operating under a Gulf shrimp permit has to have an operating VMS onboard.

Shrimp vessels can be divided into 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.

The Gulf shrimp fishery is the largest of the nation's shrimp fisheries. In 2018, the 215.4 mp and $393.6 million of Gulf shrimp landings represented approximately 74% of the nation's combined shrimp landings by weight and 79% by value (Fisheries of the United States, 2018). Louisiana led all Gulf states with 90.7 mp, followed in turn by Texas (72.1 mp), Alabama (28.2 mp), Florida West Coast (14.5 mp), and Mississippi (9.9 mp).

More information about those vessels and the economics of the Gulf Shrimp Fishery can be found in Liese (2014) and Amendment 17B (2017) and is incorporated by reference.

3.3.2 Recreational Sector

Gulf Angler Effort

Estimates of angler effort (individual angler trips regardless of trip duration or species target intent or catch success) for 2011-2018 are provided in Table 3.3.2.1. Florida has the largest number of annual angler trips. Individual angler trips into the EEZ from 2011 through 2013 by state range from 1.5% of all individual angler trips out of Louisiana to 9.6% of all angler trips out of Alabama (Table 3.3.2.2).

Table 3.3.2.1. Number and annual average of angler trips, all modes, both state and federal waters, 2011 – 2018.1

Year	AL	FL	LA	MS
2011	5,737,821	40,063,360	11,453,646	4,503,301
2012	6,150,613	44,997,654	10,889,486	4,492,747
2013	6,768,525	46,293,290	10,770,452	4,341,700
2014	6,481,789	38,625,282	NA[2]	4,311,510
2015	6,829,718	35,730,006	NA[2]	4,593,570
2016	7,319,601	38,936,416	NA[2]	4,717,914
2017	8,493,459	41,840,176	NA[2]	4,847,581
2018	6,680,646	40,996,400	NA[2]	4,554,960
Average 2011-2013	6,218,986	43,784,768	11,037,861	4,445,916
Average 2014 -2018	7,161,043	39,225,656	NA[2]	4,605,107

1. Texas information unavailable because the MRIP survey is not conducted in Texas.
2. Not available due to the implementation of the Louisiana Creel Survey.
3. Average of 2011-2013.
Source: NMFS Office of Science & Technology, Recreational Fisheries Statistics Queries, May 13, 2020.

Table 3.3.2.2. Percentage of all angler trips (all modes in both state and federal waters) that were in EEZ, 2011 – 2018.

Year	AL	FL	LA	MS
2011	11.8%	6.2%	1.6%	1.4%
2012	8.3%	6.7%	1.7%	3.3%
2013	8.6%	6.7%	1.1%	2.1%
2014	6.1%	6.7%	NA[2]	2.5%
2015	7.8%	6.7%	NA[2]	4.5%
2016	8.4%	5.6%	NA[2]	2.2%
2017	11.2%	6.4%	NA[2]	3.3%
2018	9.2%	6.3%	NA[2]	2.6%
Average 2011-2013	9.6%	6.5%	1.5%	2.3%
Average 2014 -2018	8.5%	6.3%	NA[2]	3.0%

1. Texas information unavailable because the MRIP survey is not conducted in Texas.
2. Not available due to the implementation of the Louisiana Creel Survey.
3. Average of 2011-2013.
Source: NMFS Office of Science & Technology, Recreational Fisheries Statistics Queries, May 13, 2020.

Anglers take their own or leased boats or go by charter boats or headboats into the EEZ. Angler trips by charter boat into the EEZ account, on average, for less than 1% of all angler trips by all modes across the states (Table 3.3.2.3). Individual angler trips by private/rental boat into the EEZ account for the largest percentage of all individual angler trips in Alabama (Table 3.3.2.4).

Table 3.3.2.3. Percentage of all angler trips (all modes in both state and federal waters) that were by charter boat in EEZ, 2011 – 2018.

Year	AL	FL	LA	MS
2011	0.9%	0.6%	0.1%	0.0%
2012	0.5%	0.7%	0.2%	0.0%
2013	0.8%	0.7%	0.1%	0.0%
2014	0.7%	0.9%	NA[2]	0.0%
2015	0.9%	1.1%	NA[2]	0.0%
2016	1.0%	1.0%	NA[2]	0.0%
2017	0.7%	0.9%	NA[2]	0.1%
2018	0.8%	1.0%	NA[2]	0.0%
Average 2011-2013	0.7%	0.7%	0.1%	0.0%
Average 2014 -2018	0.8%	1.0%	NA[2]	0.0%

1. Texas information unavailable because the MRIP survey is not conducted in Texas.
2. Not available due to the implementation of the Louisiana Creel Survey.
3. Average of 2011-2013.
Source: NMFS Office of Science & Technology, Recreational Fisheries Statistics Queries, May 13, 2020.

Table 3.3.2.4. Percentage of all angler trips (all modes in both state and federal waters) by private/rental boat in EEZ, 2011 – 2018.

Year	AL	FL	LA	MS
2011	11.0%	5.6%	1.5%	1.4%
2012	7.8%	6.0%	1.6%	3.2%
2013	7.8%	6.0%	1.0%	2.1%
2014	5.4%	5.8%	NA	2.5%
2015	6.9%	5.6%	NA	4.5%
2016	7.4%	4.6%	NA	2.2%
2017	10.5%	5.5%	NA	3.3%
2018	8.4%	5.3%	NA	2.6%
Average 2011-2013	8.8%	5.9%	1.4%	2.3%
Average 2014 -2018	7.7%	5.4%	NA	3.0%

1. Texas information unavailable because the MRIP survey is not conducted in Texas.
2. Not available due to the implementation of the Louisiana Creel Survey.
3. Average of 2011-2013.
Source: NMFS Office of Science & Technology, Recreational Fisheries Statistics Queries, May 13, 2020.

Estimates of headboat angler effort in the Gulf for 2014 through 2018 are provided in Table 3.3.2.5. These estimates are derived from the NMFS Southeast Region Headboat Survey (SRHS). Headboat angler effort is calculated as angler days, which are a standardized count of trips that result from the combination of partial-day, full-day, and multiple-day trips. The SRHS includes some vessels that do not possess a federal for-hire permit and operate solely in state waters. Alabama is combined with Florida and Mississippi is combined with Louisiana for confidentiality purposes.

Table 3.3.2.5. Gulf headboat angler days in state and federal waters, by state(s), 2011–2018.

Year	FL/AL	LA/MS	TX	Total
2011	157,025	3,657	47,284	207,966
2012	161,975	3,680	51,776	217,431
2013	174,731	3,406	55,749	233,886
2014	191,365	3,257	51,231	245,853
2015	194,383	3,587	55,135	253,105
2016	199,978	2,955	54,083	257,016
2017	196,657	3,189	51,575	251,421
2018	191,847	3,235	52,160	247,242
Average 2011 - 2013	164,577	3,581	51,603	219,761
Average 2014 - 2018	194,846	3,245	52,837	250,927

Source: NMFS SERO SRHS.

Permits

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

For a person aboard a vessel that is operating as a charter vessel or headboat to fish for or possess Gulf reef fish or coastal migratory pelagic fish, in or from the EEZ, a valid charter vessel/headboat permit for Gulf reef fish or coastal migratory pelagic fish, respectively, must have been issued to the vessel and must be on board. Those with a historical captain permit for reef fish or coastal migratory pelagics as of October 25, 2018, can transfer to the standard charter/headboat permit for reef fish or coastal migratory pelagics as of May 21, 2020. All four permits are limited access. See Table 3.2.2.6 for a recent history of the number of those permits.

As of May 14, 2020, there were 34 historical captain permits for pelagics, 34 historical captain permits for reef fish and 1,283 and 1,273 charter/headboat permits for pelagics and reef fish, respectively.

Table 3.3.2.6. Relevant charter/headboat permits for coastal migratory pelagics and reef fish, 2011–2018.

Year	Historical Captain Pelagic	Historical Captain RF	Charter/Headboat Pelagics	Charter/Headboat RF
2011	44	43	1379	1353
2012	43	42	1360	1336
2013	41	40	1342	1323
2014	36	35	1326	1310
2015	35	34	1306	1294
2016	34	33	1294	1282
2017	33	32	1287	1277
2018				

Source: NMFS SERO Permit Counts for 2011 – 2016, GFMC 2017 for 2017.

3.4 Description of the Social Environment

Modifying fishing access in two MPAs is intended to reduce the incidence of illegal fishing activity. As discussed in Sections 4.1.4 and 4.2.4, some positive effects could accrue to fishermen and communities associated with the reef fish, CMP, and shrimp fisheries in the Gulf. However, any positive effects would be small and accrue to the social environment broadly.

This section includes a description of the permits and endorsements related to the commercial reef fish, CMP, and shrimp fisheries and recreational reef fish and CMP fishing. Permits and endorsements are presented by state in order to provide a geographic distribution of fishing involvement. Top communities based on the number of permits and endorsements are presented.

In addition, descriptions of communities include information about the top communities based on a 'regional quotient' (RQ) of commercial landings and value for reef fish, shrimp, and CMP species. The RQ is the proportion of landings and value out of the total landings and value of that species for that region, and is a relative measure. These communities would be most likely to experience the effects of the proposed actions. If a community is identified as a reef fish, shrimp or CMP community based on the RQ, this does not necessarily mean that the community would experience significant impacts due to changes in the fishery if a different species or number of species were also important to the local community and economy. Additional detailed information about communities with the highest RQs can be found for Gulf communities on the Southeast Regional Office (SERO)'s Community Snapshots website.[17]

VMS traffic analysis data and electronic logbook (ELB) and shrimp vessel activity analysis data are also presented at the state and community level for vessels that entered the Madison-Swanson and Steamboat Lumps MPAs.

[17] https://www.fisheries.noaa.gov/southeast/socioeconomics/snapshots-human-communities-and-fisheries-gulf-mexico-and-south-atlantic

Community level data are presented 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. Lastly, social vulnerability data are presented to assess the potential for environmental justice concerns.

3.4.1 Commercial Sector

Reef Fish

As of May 6, 2020, there were 827 federally-permitted commercial Gulf reef fish vessels (SERO permit office). Gulf reef fish permits are issued to individuals in Florida (79.6% of Gulf reef fish vessels), Texas (8.6%), Alabama (4.5%), Louisiana (4.2%), and Mississippi (less than 1%, SERO permit office, May 6, 2020). Residents of other states (Arkansas, Connecticut, Georgia, Illinois, Maryland, Missouri, North Carolina, New York, and South Carolina) also hold commercial reef fish permits, but these states represent a smaller percentage of the total number of issued permits.

Gulf reef fish permits are held by individuals with mailing addresses in 243 communities (SERO permit office, May 6, 2020). Communities with the most commercial reef fish permits are located in Florida and Texas (Table 3.4.1.1). The communities with the most reef fish permits are Panama City, Florida (8.7% of reef fish permits), Key West, Florida (4.8%), and St. Petersburg, Florida (3.5%).

Table 3.4.1.1. Top communities by number of Gulf reef fish permits and Eastern Gulf reef fish bottom longline endorsements.

State	Community	Reef Fish Permits (RR)	State	Community	Eastern Gulf Reef Fish Bottom Longline Endorsements (RRLE)
FL	Panama City	72	FL	Cortez	9
FL	Key West	40	FL	Largo	6
FL	St. Petersburg	29	FL	Seminole	6
FL	Destin	24	FL	St. Petersburg	6
FL	Largo	23	FL	Lecanto	4
TX	Galveston	22	FL	Madeira Beach	4
FL	Pensacola	20	FL	Palm Harbor	4
FL	Cortez	19	FL	Clearwater	3
FL	Seminole	18	FL	Indian Shores	3
FL	Clearwater	16	FL	Panama City	3
FL	Tampa	14			
FL	Naples	13			
TX	Houston	11			
FL	Apalachicola	10			
FL	Hudson	10			
FL	Lecanto	10			
FL	Lynn Haven	10			
FL	Steinhatchee	10			
FL	Tarpon Springs	10			

Source: SERO permit office, May 6, 2020.

A valid Gulf reef fish permit is required for a commercial Eastern Gulf reef fish bottom longline endorsement. As of May 6, 2020, there were 62 federally-endorsed commercial Eastern Gulf reef fish bottom longline vessels (SERO permit office). Nearly all Eastern Gulf reef fish bottom longline endorsements are issued to individuals in Florida, with two endorsements issued to individuals in Texas. Longline endorsements are held by individuals with mailing addresses in 22 communities, and a large portion of these communities are located in the greater Tampa Bay area in Pinellas, Manatee, and Sarasota Counties (approximately 76% of communities with bottom longline endorsements, SERO permit office, May 6, 2020). The communities with the most longline endorsements are Cortez, Florida (14.5% of longline endorsements), followed by Largo, Seminole, and St. Petersburg, Florida (each with 9.7%, Table 3.4.1.1).

The top reef fish communities ranked by pounds of commercial landings are dominated by Florida communities, though Galveston, Texas, ranks first in terms of pounds of overall reef fish landings (snappers, groupers, tilefishes, jacks, triggerfish, and hogfish, Figure 3.4.1.1). Panama City, Florida, ranks second in terms of value RQ for total reef fish and Madeira Beach, Florida is third.

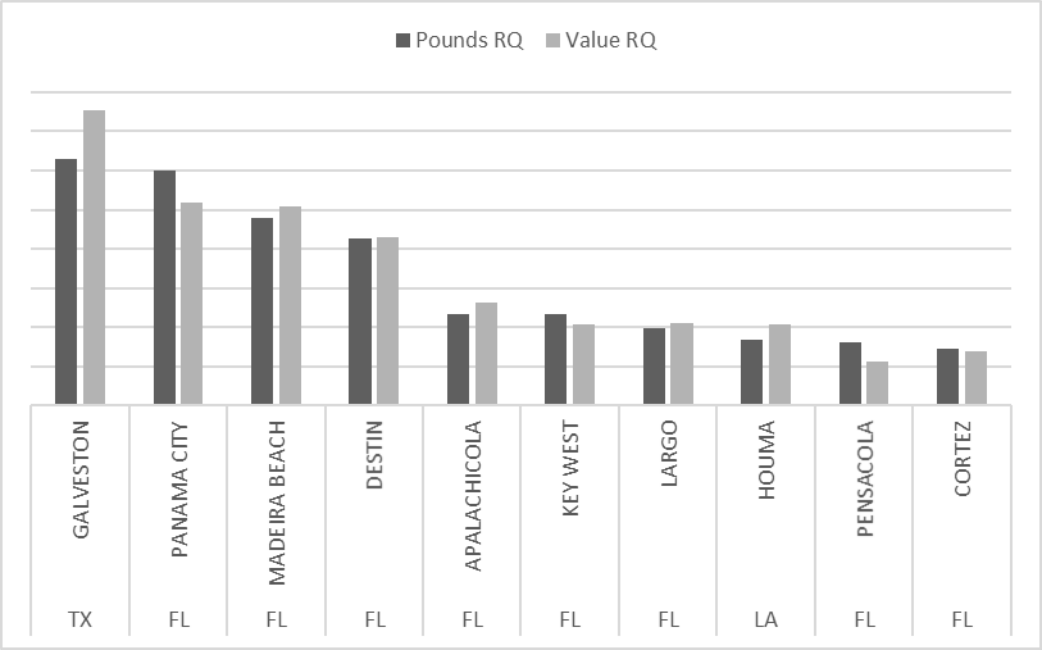

Figure 3.4.1.1. Top 10 Gulf communities ranked by pounds and value RQ for total reef fish. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2018.

Coastal Migratory Pelagics

King Mackerel

As of May 6, 2020, there were 1,418 federally-permitted commercial king mackerel vessels (SERO permit office). Commercial king mackerel permits are issued to individuals residing in the Gulf, South Atlantic, Mid-Atlantic, New England, and other states. Approximately 80.5% of king mackerel permits are issued to individuals in Gulf states. Within the Gulf states, the majority of king mackerel permits are issued to individuals in Florida (72.1%% of king mackerel vessels), followed by Louisiana (3%), Texas (2.5%), Alabama (2.3%), and Mississippi (less than 1%, SERO permit office, May 6, 2020). Individuals in South Atlantic states, such as North Carolina (15.1%) and South Carolina (1.7%) also hold a sizable percentage of the total number of issued permits. Residents of other states (Connecticut, Delaware, Georgia, Illinois, Massachusetts, Maryland, Michigan, Minnesota, New Jersey, New York, Virginia, and West Virginia) also hold commercial king mackerel permits, but these states represent a smaller percentage of the total number of issued permits.

Commercial king mackerel permits are held by individuals with mailing addresses in 357 communities (SERO permit office, May 6, 2020). Communities with the most commercial king mackerel permits are located in Florida and North Carolina (Table 3.4.1.2). The communities with the most king mackerel permits are Key West, Florida (5.3% of king mackerel permits), Panama City, Florida (3.5%), and Fort Pierce, Florida (3.2%).

Table 3.4.1.2. Top communities by number of king mackerel permits.

State	Community	King Mackerel Permits (KM)
FL	Key West	75
FL	Panama City	49
FL	Fort Pierce	45
FL	Jupiter	44
FL	Stuart	42
FL	Miami	36
FL	Jacksonville	34
FL	Merritt Island	23
FL	Sebastian	23
NC	Southport	23
NC	Wilmington	22
FL	Vero Beach	21
NC	Hatteras	20
FL	Naples	18
FL	Destin	17

Source: SERO permit office, May 6, 2020.

The top Gulf king mackerel communities are located in Florida, Louisiana, and Alabama (Figure 3.4.1.2). Destin, Florida ranks first in terms of pounds of overall king mackerel landings, followed by Key West, Florida and Naples, Florida.

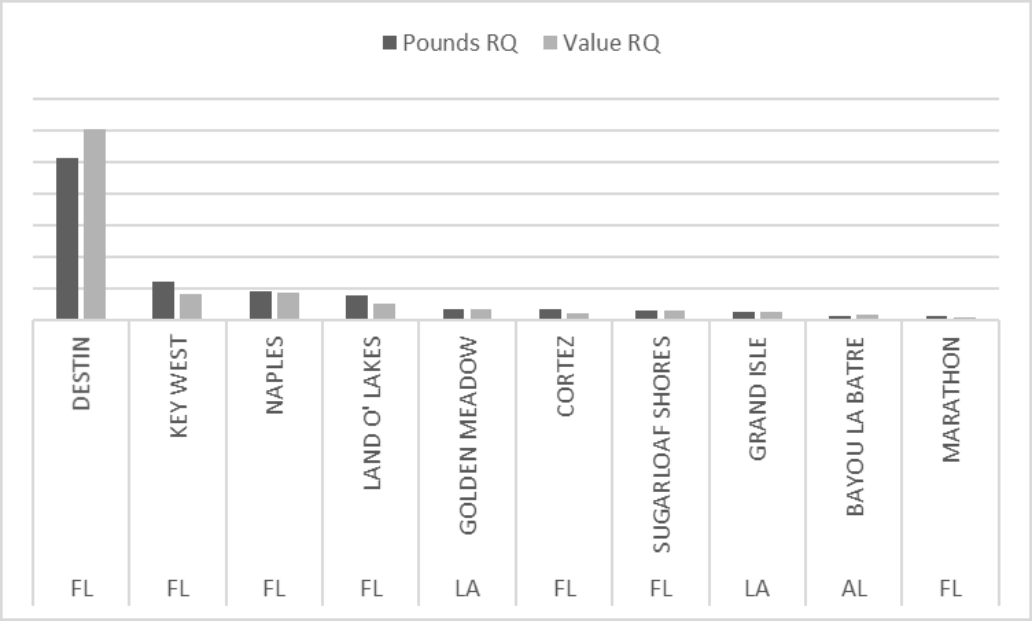

Figure 3.4.1.2. Top 10 Gulf communities ranked by pounds and value RQ for king mackerel. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2018.

Spanish Mackerel

As of May 6, 2020, there were 1,785 federally-permitted commercial Spanish mackerel vessels (SERO permit office). Commercial Spanish mackerel permits are issued to individuals residing in the Gulf, South Atlantic, Mid-Atlantic, New England, and other states. Approximately 78.4% of Spanish mackerel permits are issued to individuals in Gulf states. Within the Gulf states, the majority of Spanish mackerel permits are issued to individuals in Florida (73.3%% of Spanish mackerel vessels), followed by Louisiana (2.6%), Alabama (1.4%), Texas (less than 1%), and Mississippi (less than 1%, SERO permit office, May 6, 2020). Individuals in South Atlantic and Mid-Atlantic states, such as North Carolina (15%), South Carolina (1.6%), and New Jersey (1.5%) also hold a sizable percentage of the total number of issued permits. Residents of other states (Connecticut, Delaware, Georgia, Illinois, Massachusetts, Maryland, Maine, Michigan, Minnesota, New York, Pennsylvania, Virginia, Wisconsin, and West Virginia) also hold commercial Spanish mackerel permits, but these states represent a smaller percentage of the total number of issued permits.

Commercial Spanish mackerel permits are held by individuals with mailing addresses in 357 communities (SERO permit office, May 6, 2020). Communities with the most commercial Spanish mackerel permits are located in Florida and North Carolina (Table 3.4.1.3). The communities with the most Spanish mackerel permits are Key West, Florida (5.9% of Spanish mackerel permits), Panama City, Florida (2.8%), and Miami, Florida (2.7%).

Table 3.4.1.3. Top communities by number of Spanish mackerel permits.

State	Community	Spanish Mackerel Permits (SM)
FL	Key West	105
FL	Panama City	50
FL	Miami	48
FL	Jupiter	47
FL	Stuart	47
FL	Fort Pierce	43
FL	Marathon	35
FL	Jacksonville	31
FL	Sebastian	23
FL	Merritt Island	22
FL	Port Orange	22
FL	St. Petersburg	22
NC	Wilmington	22
FL	Vero Beach	21
FL	Ft. Lauderdale	20
FL	Naples	20
FL	Winter Springs	20

Source: SERO permit office, May 6, 2020.

The top Gulf Spanish mackerel communities are located in Florida, Alabama, and Mississippi (Figure 3.4.1.3). Destin, Florida ranks first in terms of pounds of overall Spanish mackerel landings, followed by Bon Secour, Alabama, and Bayou La Batre, Alabama.

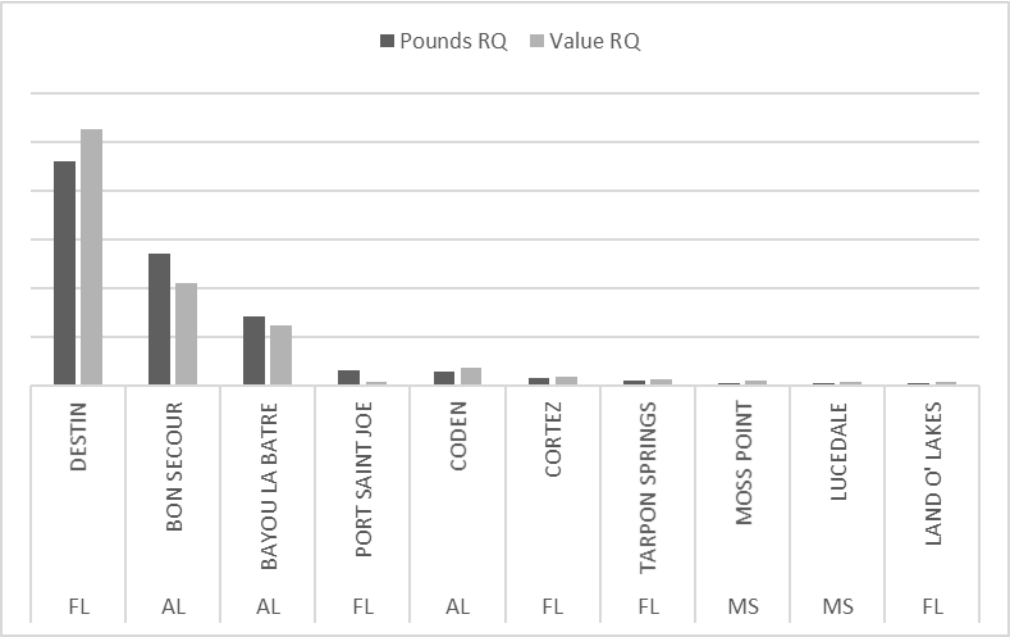

Figure 3.4.1.3. Top 10 Gulf communities ranked by pounds and value RQ for Spanish mackerel. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2018.

Cobia

The top Gulf cobia communities are located in Florida, Louisiana, Texas, and Alabama (Figure 3.4.1.4). Destin, Florida ranks first in terms of pounds of overall cobia landings, followed by Gretna, Louisiana, and Key West, Florida.

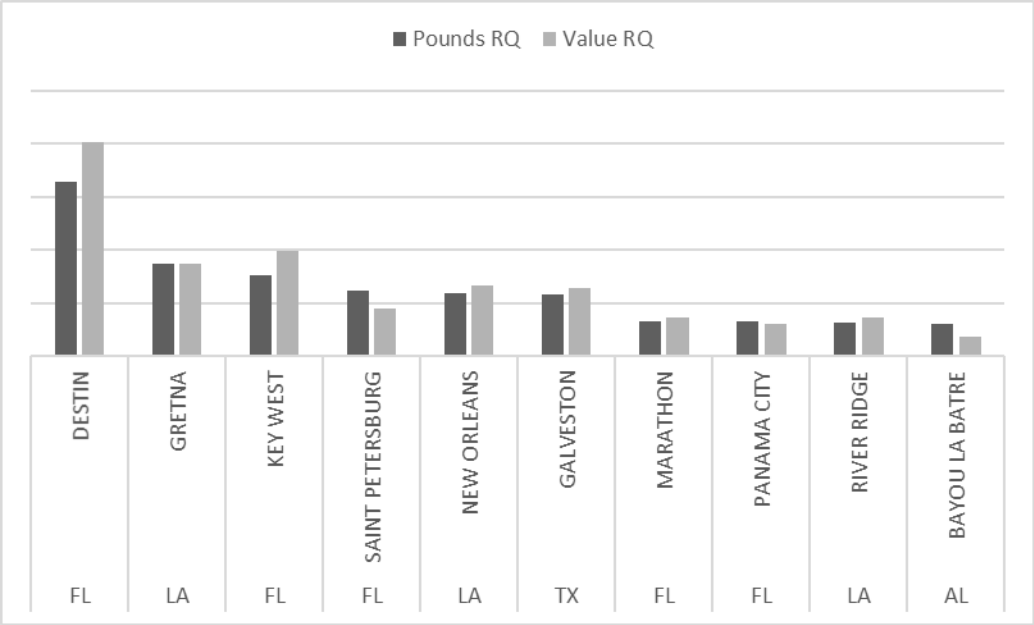

Figure 3.4.1.4. Top 10 Gulf communities ranked by pounds and value RQ for cobia. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2018.

Shrimp

As of May 6, 2020, there were 1,395 federally-permitted Gulf shrimp vessels (SERO permit office). Gulf shrimp permits are issued to individuals in Texas (38.4% of Gulf shrimp vessels), Louisiana (approximately 25.6%), Florida (14.5%), Alabama (8.1%), and Mississippi (7%, SERO permit office, May 6, 2020). Residents of other states (Georgia, Hawaii, Illinois, Massachusetts, Minnesota, North Carolina, New Jersey, New York, Oklahoma, South Carolina, and Virginia) also hold commercial shrimp permits, but these states represent a smaller percentage of the total number of issued permits.

Gulf shrimp permits are held by individuals with mailing addresses in 255 communities (SERO permit office, May 6, 2020). Communities with the most commercial shrimp permits are located in Texas, Louisiana, Mississippi, and Alabama (Table 3.4.1.4). The communities with the most shrimp permits are Brownsville, Texas (5.8% of shrimp permits), Port Isabel, Texas (5.2%), and Palacios, Texas (5.2%).

The top shrimp communities ranked by pounds of commercial landings are dominated by Texas and Louisiana communities. However, Bayou La Batre, Alabama, ranks first in terms of pounds of overall shrimp landings (brown, white, pink, royal red, rock, and seabob, Figure 3.4.1.5). Palacios, Texas, ranks second in terms of value RQ for total shrimp, and Port Arthur, Texas is third. Many Louisiana communities have a lower RQ for value, which indicates lower prices for smaller shrimp in most cases.

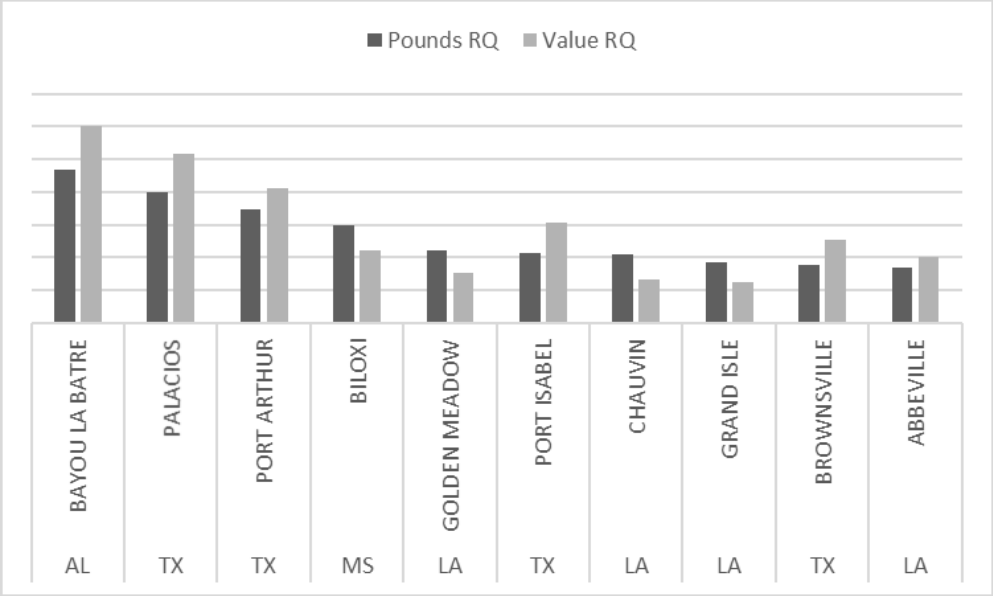

Figure 3.4.1.5. Top 10 Gulf communities ranked by pounds and value RQ for total shrimp. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2018.

A valid Gulf shrimp permit is required for a Gulf royal red shrimp endorsement. As of May 6, 2020, there were 303 federally-endorsed Gulf royal red shrimp vessels (SERO permit office). Gulf royal red shrimp endorsements are issued to individuals in Texas (33.7%), Alabama (18.2%), Florida (16.5%), Louisiana (10.6%), North Carolina (10.2%), and Mississippi (5.6%, SERO permit office, May 6, 2020). Residents of other states (Georgia, Illinois, Massachusetts, New Jersey, and Virginia) also hold royal red shrimp endorsements, but these states represent a smaller percentage of the total number of issued permits.

Royal red shrimp endorsements are held by individuals with mailing addresses in 85 communities (SERO permit office, May 6, 2020). Communities with the most royal red shrimp endorsements are located in all Gulf states, as well as North Carolina and Virginia (Table 3.4.1.4). The communities with the most royal red shrimp endorsements are Brownsville, Texas (13.2% of royal red endorsements), Port Isabel, Texas (12.5%), and Oriental, North Carolina (5.3%).

Gulf royal red shrimp is landed in Alabama and Louisiana (SERO Community ALS, 2018). Bon Secour, Alabama is the top royal red shrimp community as ranked by pounds of commercial landings and includes the majority of Gulf landings. Coden, Alabama and Cameron, Louisiana are the other two Gulf ports with commercial landings of royal red shrimp.

Table 3.4.1.4. Top communities by number of Gulf shrimp permits and Gulf royal red shrimp endorsements.

State	Community	Shrimp Permits (SPGM)	State	Community	Royal Red Shrimp Endorsements (GRRS)
TX	Brownsville	81	TX	Brownsville	40
TX	Port Isabel	73	TX	Port Isabel	38
TX	Palacios	72	NC	Oriental	16
LA	Chauvin	39	AL	Bayou La Batre	15
TX	Houston	39	AL	Mobile	13
TX	Port Lavaca	37	FL	Fort Myers Beach	12
LA	Cut Off	34	AL	Irvington	11
MS	Biloxi	31	FL	Jacksonville	8
AL	Bayou La Batre	29	VA	Newport News	7
AL	Mobile	28	AL	Theodore	6
TX	Port Arthur	25	LA	Chauvin	6
LA	Abbeville	23	MS	Biloxi	6
TX	Nederland	23	FL	Pensacola	5
LA	Lafayette	21	NC	Hobucken	5
TX	Galveston	20			

Source: SERO permit office, May 6, 2020.

3.4.2 Recreational Sector

Reef Fish

As of May 6, 2020, there were 1,274 federally-permitted charter/headboat for reef fish vessels (SERO permit office). Charter/headboat for reef fish permits are issued to individuals in Florida (59.9% of charter/headboat for reef fish vessels), Texas (15.6%), Alabama (10.2%), Louisiana (7.6%), and Mississippi (2.7%, SERO permit office, May 6, 2020). Residents of other states (Arkansas, California, Connecticut, Georgia, Illinois, Indiana, Kansas, Michigan, Montana, North Carolina, New Jersey, New York, Ohio, Oklahoma, Tennessee, Utah, Virginia, and Wisconsin) also hold charter/headboat permits, but these states represent a smaller percentage of the total number of issued permits.

Charter/headboat for reef fish permits are held by individuals with mailing addresses in 355 communities (SERO permit office, May 6, 2020). Communities with the most charter/headboat for reef fish permits are located in Florida, Alabama, Texas, and Louisiana (Table 3.4.2.1). The communities with the most charter/headboat permits are Destin, Florida (4.9% of charter/headboat permits), Panama City, Florida (approximately 4.4%), and Orange Beach, Alabama (3.8%).

Table 3.4.2.1. Top communities by number of Gulf charter/headboat for reef fish permits.

State	Community	Charter/Headboat for Reef Fish Permits (RCG)
FL	Destin	63
FL	Panama City	56
AL	Orange Beach	49
FL	Naples	47
FL	Key West	37
FL	Pensacola	28
FL	Sarasota	25
FL	St. Petersburg	22
TX	Galveston	21
FL	Clearwater	18
FL	Cape Coral	17
FL	Fort Myers	17
TX	Corpus Christi	15
LA	Baton Rouge	14
LA	Metairie	14
TX	Houston	14

Source: SERO permit office, May 6, 2020.

As of May 6, 2020, there were 34 federally-permitted historical captain charter/headboat for reef fish vessels (SERO permit office). Historical captain charter/headboat permits are issued to individuals in Florida (52.9% of historical captain charter/headboat vessels), Louisiana (17.6%), Alabama (11.8%), Texas (11.8%), and Mississippi (5.9%, SERO permit office, May 6, 2020).

Historical captain charter/headboat for reef fish permits are held by individuals with mailing addresses in 24 communities (SERO permit office, May 6, 2020). Communities with the most historical captain permits are located in Florida, Alabama, Louisiana, and Mississippi (Table 3.4.2.2). The communities with the most historical captain charter/headboat permits are Naples, Florida, followed by Port St. Joe, Florida, and Orange Beach, Alabama.

Table 3.4.2.2. Top communities by historical captain Gulf charter/headboat for reef fish permits.

State	Community
FL	Naples
FL	Port St. Joe
AL	Orange Beach
FL	Destin
FL	Panama City
LA	Houma
LA	Metairie
MS	Biloxi

Source: SERO permit office, May 6, 2020.

Coastal Migratory Pelagics

As of May 6, 2020, there were 1,283 federally-permitted charter/headboat for coastal migratory pelagic vessels (SERO permit office). Charter/headboat for coastal migratory pelagic permits are issued to individuals in Florida (59.2% of charter/headboat for coastal migratory pelagic vessels), Texas (16.4%), Alabama (10.1%), Louisiana (7.3%), and Mississippi (2.7%, SERO permit office, May 6, 2020). Residents of other states (California, Connecticut, Georgia, Illinois, Indiana, Kansas, Michigan, Missouri, North Carolina, New Jersey, New York, Ohio, Oklahoma, Rhode Island, Tennessee, Utah, Virginia, and Wisconsin) also hold charter/headboat permits, but these states represent a smaller percentage of the total number of issued permits.

Charter/headboat for coastal migratory pelagic permits are held by individuals with mailing addresses in 364 communities (SERO permit office, May 6, 2020). Communities with the most charter/headboat permits are located in Florida, Alabama, Texas, and Louisiana (Table 3.4.2.3). The communities with the most charter/headboat permits are Destin, Florida (4.9% of charter/headboat permits), Panama City, Florida (4.5%), and Orange Beach, Alabama (3.7%).

Table 3.4.2.3. Top communities by number of Gulf charter/headboat for pelagic fish permits. Destin, Panama City, and Naples were among the top communities by number of historical captain Gulf charter/headboat for pelagic fish permits and are marked with an asterisk.

State	Community	Charter/Headboat for CMP Permits (CHG)
FL	Destin*	63
FL	Panama City*	58
AL	Orange Beach	48
FL	Naples*	47
FL	Key West	37
FL	Pensacola	28
FL	Sarasota	24
FL	St. Petersburg	21
TX	Galveston	21
FL	Clearwater	18
TX	Corpus Christi	18
FL	Cape Coral	17
FL	Fort Myers	17
TX	Houston	16
LA	Baton Rouge	14
TX	Port Aransas	14

Source: SERO permit office, May 6, 2020.

As of May 6, 2020, there were 34 federally-permitted historical captain charter/headboat for pelagic fish vessels (SERO permit office) with mailing addresses in 25 communities. Communities with the most historical captain permits are located in Florida, Louisiana, and Mississippi (SERO permit office). The communities with the most historical captain charter/headboat permits that are also among the top communities for charter/headboat for pelagic fish permits are Destin, Panama City, and Naples, Florida (Table 3.4.2.3).

3.4.3 MPAs Traffic and Activities Analysis

VMS Analysis

The VMS traffic analysis is described in detail in Appendix B. The VMS analysis provides a summary of the vessels that were detected having entered the Madison-Swanson and/or Steamboat Lumps MPAs including vessels categorized as those with Gulf commercial permits for reef fish, charter/headboat for reef fish, HMS and pelagic longline, and rock shrimp vessels. Rock shrimp is a South Atlantic species; however, it is likely that these vessels were detected because VMS is required for South Atlantic rock shrimp vessels and these vessels are also engaged in fishing for Gulf species. These data were analyzed at the vessel level and duplicate

vessels were removed. Included vessels were associated with the registered permit holder's address of residence.

From 2014 to 2019, 147 unique VMS-detected vessels entered the MPAs (Table 3.4.3.1). The majority of these vessels were registered with addresses in Florida (83.7%), followed by Alabama (4.8%), and Mississippi (3.4%, Table 3.4.4.1). Residents of other states' (Georgia, North Carolina, New York, and South Carolina) vessels also entered the MPAs, but these states represent a smaller percentage of the total number of VMS-detected vessels.

Table 3.4.3.1. Number of unique VMS-detected vessels that entered Madison-Swanson and Steamboat Lumps from 2014 to 2019, by state.

State	Vessels
AL	7
FL	123
LA	0
MS	5
TX	0
Other	12
Total	**147**

Source: SEFSC VMS-MPA analysis and SERO permit office.

The majority of VMS-detected vessels that entered the MPAs were Gulf commercial reef fish vessels (74.8%), followed by rock shrimp (14.3%), HMS and pelagic longline (8.8%), Gulf charter for reef fish (confidential), and pending vessel permits with no category associated (confidential, SEFSC VMS-MPA analysis and SERO permit office, 2014-2019).

VMS-detected vessels that entered the MPAs were associated with individuals with mailing addresses in 50 communities (SEFSC VMS-MPA analysis and SERO permit office, 2014-2019). Communities with the most VMS-detected vessels that entered the MPAs are located in Florida, Alabama, and North Carolina (Table 3.4.3.2). The communities with the most VMS-detected vessels that entered the MPAs are Panama City, Florida (25.9% of vessels), Largo, Florida (7.5%), and Seminole, Florida (4.8%).

Table 3.4.3.2. Top communities by number of unique VMS-detected vessels that entered Madison-Swanson and Steamboat Lumps from 2014 to 2019.

State	Community	Vessels
FL	Panama City	38
FL	Largo	11
FL	Seminole	7
FL	St. Petersburg	6
FL	Apalachicola	5
FL	Destin	5
FL	Lecanto	4
AL	Irvington	3
FL	Cortez	3
FL	Southport	3
NC	Oriental	3

Source: SEFSC VMS-MPA analysis and SERO permit office.

ELB and Shrimp Vessel Analysis

The ELB and shrimp vessel activity analysis is described in detail in Appendix C. The ELB analysis provides a summary of the federally-permitted shrimp vessels that were detected having entered the Madison-Swanson and/or Steamboat Lumps MPAs. These data were analyzed at the vessel level and duplicate vessels were removed. Included vessels were associated with the registered permit holder's address of residence.

From 2014 to 2019, 44 unique federally-permitted shrimp vessels entered the MPAs (SEFSC ELB-MPA analysis). The shrimp vessels were registered with addresses in Alabama (40.9%), followed by Florida (22.7%), Texas (15.9%), Mississippi (13.6%), and North Carolina (6.8%), (SEFSC ELB-MPA analysis and SERO permit office, 2014-2019).

Federally-permitted shrimp vessels that entered the MPAs were associated with individuals with mailing addresses in 25 communities (SEFSC ELB-MPA analysis and SERO permit office, 2014-2019). Communities with the most shrimp vessels that entered the MPAs are located in Alabama and North Carolina (Table 3.4.3.3). The communities with the most federally-permitted shrimp vessels that entered the MPAs are Irvington, Alabama (15.9% of vessels), Bayou La Batre, Alabama (11.4%), Mobile, Alabama (9.1%), and Oriental, North Carolina (6.8%).

Table 3.4.3.3. Top communities by number of unique federally-permitted shrimp vessels that entered Madison-Swanson and Steamboat Lumps from 2014 to 2019.

State	Community	Vessels
AL	Irvington	7
AL	Bayou La Batre	5
AL	Mobile	4
NC	Oriental	3

Source: SEFSC ELB-MPA analysis and SERO permit office.

3.4.4 Environmental Justice

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

Some positive effects could accrue to commercial and recreational fishermen and associated industries if illegal fishing activity is reduced by the proposed actions. However, these effects would be minimal and accrue broadly to the social environment through improved trust in enforcement. Effects, either positive or negative, would not be expected to accrue to populations of minorities or individuals of low-income. Information on the race and income status for groups at the different participation levels is not available. Although information is available concerning communities overall status with regard to minorities and poverty (e.g., census data), such information is not available specific to fishermen and those involved in the industries and activities, themselves. To help assess whether any EJ concerns may be present within regional communities, a suite of indices was created to examine the social vulnerability of coastal communities. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households and households with children under the age of five, disruptions such as higher separation rates, higher crime rates, and unemployment all 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. Nevertheless, the actions in this framework action would not be expected to result in any sudden changes or social disruptions.

Figures 3.4.4.1, 3.4.4.2, and 3.4.4.3 provide the social vulnerability of the top commercial and recreational reef fish, coastal migratory pelagic, and shrimp communities as well as the top communities as identified by the VMS traffic analysis and ELB and shrimp vessel analysis. Several communities exceed the threshold of one standard deviation above the mean for all three indices (Bayou La Batre, Alabama; Fort Pierce, Florida; Miami, Florida; Abbeville, Louisiana; Brownsville, Texas; Port Arthur, Texas, and Port Isabel, Texas). Several other communities exceed the threshold of one standard deviation above the mean for any of the indices (Bon Secour, Alabama; Lecanto, Florida; Chauvin, Louisiana; New Orleans, Louisiana; Biloxi, Mississippi; Hobucken, North Carolina; Houston, Texas; Palacios, Texas; and Port Lavaca, Texas). These communities would be the most likely to exhibit vulnerabilities to social or economic disruption due to regulatory change.

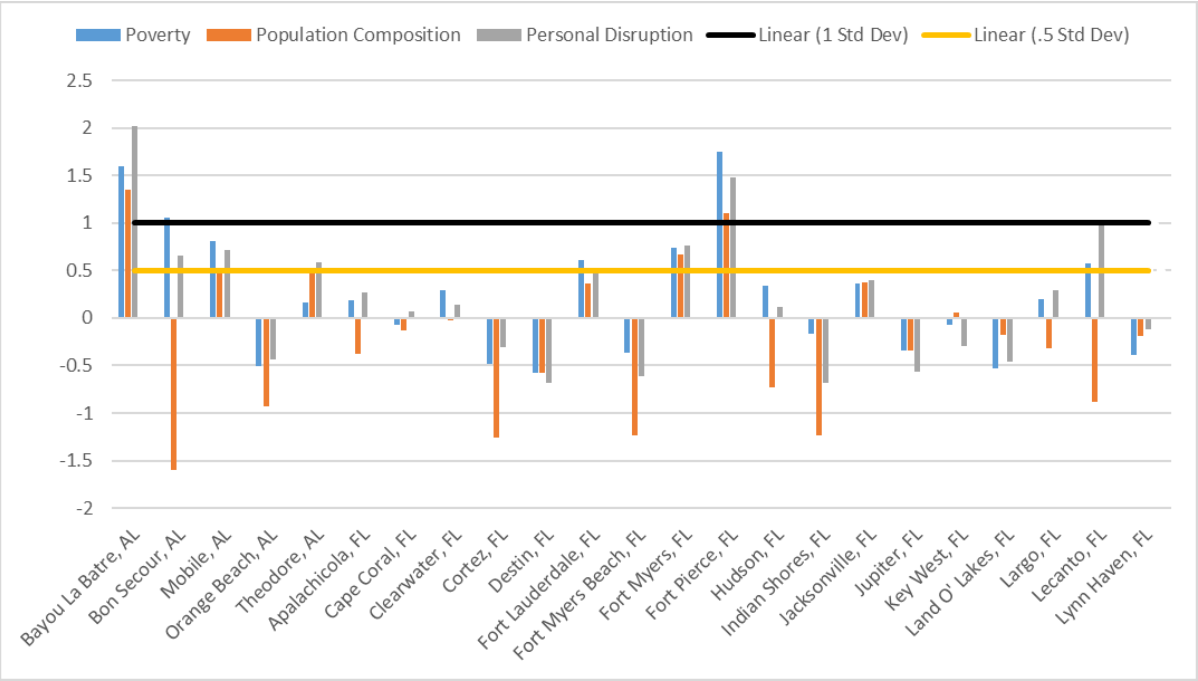

Figure 3.4.4.1. Social vulnerability indices for top commercial and recreational reef fish communities, commercial and recreational coastal migratory pelagic communities, commercial shrimp communities, and communities identified by VMS and ELB analysis.
Source: SERO, Community Social Vulnerability Indicators Database 2018 (American Community Survey 2012-2016).

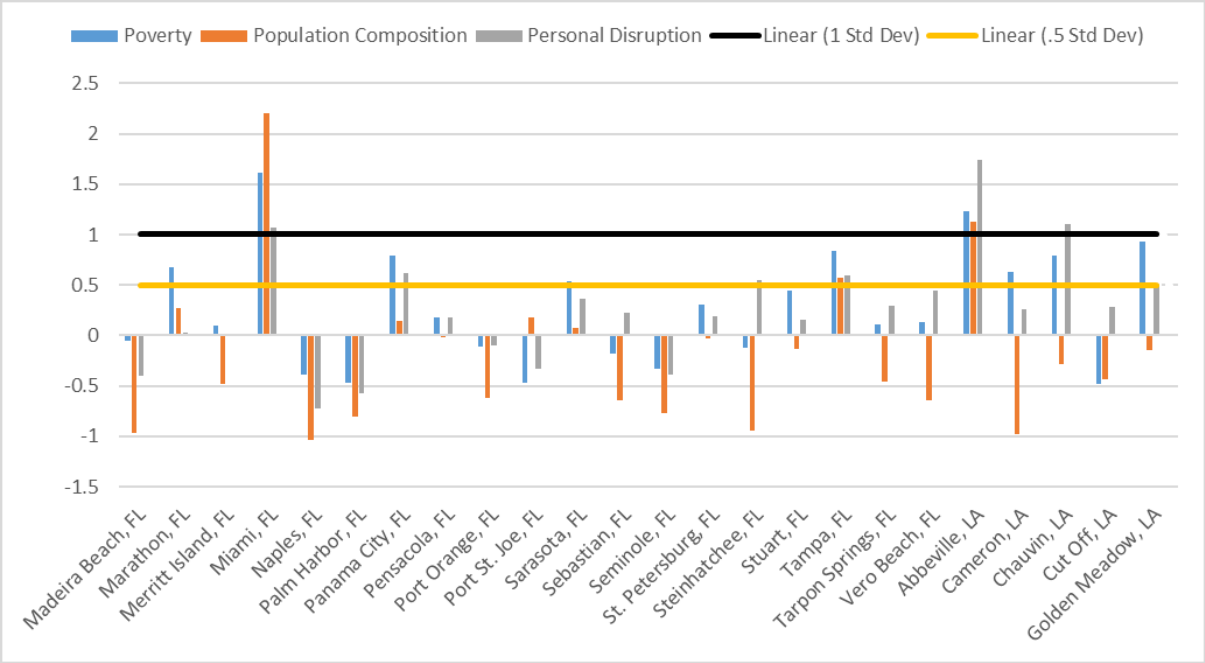

Figure 3.4.4.2. Social vulnerability indices for top commercial and recreational reef fish communities, commercial and recreational coastal migratory pelagic communities, commercial shrimp communities, and communities identified by VMS and ELB analysis continued.

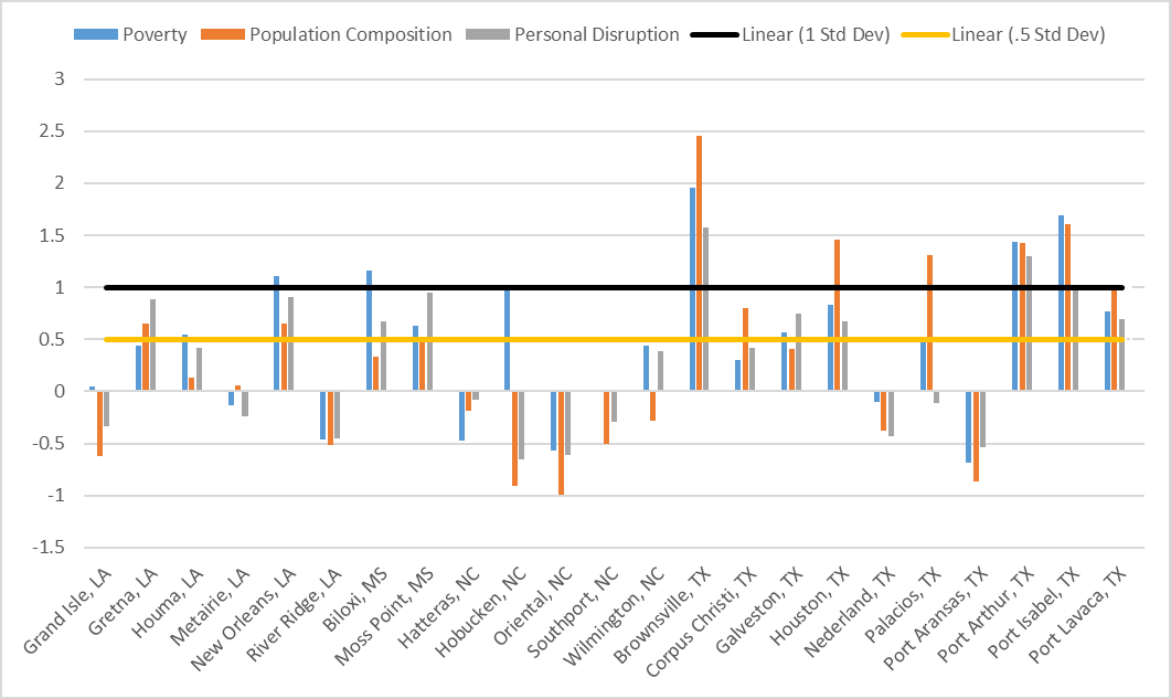

Figure 3.4.4.3. Social vulnerability indices for top commercial and recreational reef fish communities, commercial and recreational coastal migratory pelagic communities, commercial shrimp communities, and communities identified by VMS and ELB analysis continued.
Source(s): SERO, Community Social Vulnerability Indicators Database 2018 (American Community Survey 2012-2016).

People in these communities may be affected by fishing regulations in two ways: participation and employment. Although these communities may have the greatest potential for EJ concerns, data are not available on the race and income status for those involved in the local fishing industry (employment), or for their dependence on reef fish, coastal migratory pelagic species, or shrimp specifically (participation). Although no EJ issues have been identified, the absence of potential EJ concerns cannot be assumed.

3.5 Description of the Administrative Environment

3.5.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Act (16 U.S.C. 1801 *et seq*.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ, an area extending 200 nautical miles from the seaward boundary of each of the coastal states, and authority over U.S. anadromous species and continental shelf resources that occur beyond the EEZ.

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

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

The Council consists of seventeen voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NMFS. The public is also involved in the fishery management process through participation on advisory panels and through Council meetings that, with few exceptions for discussing personnel matters, are open to the public. The regulatory process is also in accordance with the Administrative Procedures Act, in the form of “notice and comment” rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

Regulations contained within FMPs are enforced through actions of NOAA’s Office of Law Enforcement, the U.S. Coast Guard, and various state authorities. To better coordinate

enforcement activities, federal and state enforcement agencies have developed cooperative agreements to enforce the Magnuson-Stevens Act. These activities are being coordinated by the Council's Law Enforcement Advisory Panel and the Gulf States Marine Fisheries Commission's Law Enforcement Committee, which have developed joint enforcement agreements and cooperative enforcement programs[18].

Atlantic HMS are managed under the dual authority of the Magnuson-Stevens Act, as amended, and the Atlantic Tunas Convention Act (ATCA). The Magnuson-Stevens Act, at 16 U.S.C. 1802(21), defines the term "highly migratory species" as "tuna species, marlin (*Tetrapturus* spp. and *Makaira* spp.), oceanic sharks, sailfishes (*Istiophorus* spp.), and swordfish (*Xiphias gladius*)." The authority to issue regulations under the Magnuson-Stevens Act and ATCA has been delegated from the Secretary to the Assistant Administrator for Fisheries, NOAA. Under ATCA, the Secretary shall promulgate such regulations as may be necessary and appropriate to carry out International Commission for the Conservation of Atlantic Tunas (ICCAT) recommendations. Additional information regarding Atlantic HMS fishery management, the 2006 Consolidated HMS fishery management plan and its amendments (implemented by regulations at 50 CFR part 635), the annual HMS SAFE Reports can be found online. [19]

3.5.2 State Fishery Management

The purpose of state representation at the Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective state fisheries. Each of the five Gulf States exercises legislative and regulatory authority over their respective state's natural resources through discrete administrative units. Although each agency is the primary administrative body with respect to the states' natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources. A more detailed description of each state's primary regulatory agency for marine resources is provided in Amendment 22 (GMFMC 2004b). Descriptions of individual state management and data collection programs can be found at the Web Pages shown in Table 3.5.2.1.

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

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

[18] www.gsmfc.org
[19] https://www.fisheries.noaa.gov/topic/atlantic-highly-migratory-species

3.5.3 Red Snapper Management

The private angling component fishing season for red snapper were set by the states under exempted fishing permits in 2018 and 2019, a permit type issued by NMFS. The states are now responsible for establishing some management measures for the private angling component for red snapper through state data collection programs (Amendment 50A; GMFMC 2019) for 2020 and subsequent years. The commercial sector and the federal for-hire component are managed by NMFS.

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action 1: Modification of Surface Trolling Provisions for Madison-Swanson and Steamboat Lumps Marine Protected Areas (MPA)

Alternative 1: No Action – Surface trolling is allowed from May 1 through October 31 within the boundaries of the Madison-Swanson and Steamboat Lumps MPAs. Surface trolling is defined as fishing with lines trailing behind a vessel which is in constant motion at speeds in excess of four knots with a visible wake, and may not involve the use of downriggers, wire lines, planers, or similar devices.

Alternative 2: Prohibit fishing year-round in the Madison-Swanson and Steamboat Lumps MPAs. This prohibition does not apply to Atlantic highly migratory species (HMS).

4.1.1 Direct and Indirect Effects on the Physical Environment

A summary of effects from longline gear on the physical environment can be found in the 2011 Regulatory Amendment to the Reef Fish FMP (GMFMC 2011c), which can include entanglements and fouling with hardbottom habitats when gear is lost. Handline gear (rod-and-reel; vertical line) is the most common gear used to harvest reef fish and coastal migratory pelagic (CMP) species. When fishing for reef fish, handline gear is generally suspended over hard bottom because many managed reef fish species occur higher over this type of substrate than over sand or mud bottoms (Generic Essential Fish Habitat Amendment; GMFMC 2004a). Sometimes fishing gear and line can become entangled on coral and hard bottom outcroppings. The subsequent algal growth can foul and eventually kill the underlying coral (Barnette 2001). Researchers conducting studies in the restricted fishing area at Madison-Swanson reported seeing lost fishing line on the bottom, much of which appeared to be older and covered with invertebrate growth (A. David, Southeast Fisheries Science Center, pers. comm.), a clear indication that bottom fishing has had an impact on the physical environment prior to fishing being prohibited in the area (Reef Fish Amendment 20; GMFMC 2003a). When surface trolling for CMP species, handline gear is in use almost exclusively at the surface, and therefore has no discernible impact on the physical environment.

Anchor damage is also associated with handline fishing vessels, particularly by the recreational sector where fishermen may repeatedly visit well marked fishing locations. Bohnsack (2000) points out that “favorite” fishing areas such as reefs are targeted and revisited multiple times, particularly with the advent of global positioning technology. The cumulative effects of repeated anchoring could damage the hard bottom areas where bottom fishing occurs. Effects from fishing on the physical environment are generally tied to fishing effort. The greater the fishing effort, the more gear interacts with the bottom. In general, an alternative which allows greater

levels of fishing effort (more gear being used) would have a greater negative effect on the physical environment than an alternative which allows for less fishing effort.

Fishing for reef fish species in the Madison-Swanson and Steamboat Lumps MPAs is presently prohibited year-round, while surface trolling is permitted only from May 1 – October 31 (**Alternative 1**). **Alternative 2** would prohibit all fishing year-round within the Madison-Swanson and Steamboat Lumps MPAs, including surface trolling; however, **Alternative 2** would not apply to Atlantic HMS. Because **Alternative 2** would effectively remove the ability to fish via surface trolling, and because surface trolling does not result in any measurable effects to the physical environment, no difference in effects is anticipated between **Alternatives 1** and **2**. However, if **Alternative 2** results in a reduction or elimination of suspected illegal bottom fishing activity within the MPAs, then the reduction or elimination of that activity would result in a positive effect for the physical environment.

4.1.2 Direct and Indirect Effects on the Biological Environment

Management actions that affect the biological and ecological environment mostly relate to the impacts of fishing on a species' population size, life history, and the role of the species within its habitat. Removal of fish from the population through fishing reduces the overall population size. Fishing gear types have different selectivity patterns which refer to a fishing method's ability to target and capture organisms by size and species. This would include the number of discards, mostly sublegal fish or fish caught during seasonal closures, and the mortality associated with releasing these fish. Under **Alternative 1**, only surface trolling is permitted. This allows for the harvest of some species, such as CMP species. Fishing for reef fish species is prohibited in the Madison-Swanson and Steamboat Lumps MPAs, and fishing for species like shrimp does not occur because trawling is not permitted. **Alternative 2** would prohibit all fishing year-round within the Madison-Swanson and Steamboat Lumps MPAs except for Atlantic HMS species (see Appendix A2 for Atlantic HMS regulations). Thus, when compared to **Alternative 1**, **Alternative 2** would be expected to result in a positive effect on the biological environment, and particularly on CMP species by reducing removals of CMP species from their respective populations. Further, any reduction or elimination of suspected illegal bottom fishing activity within the MPAs as a result of enforcing **Alternative 2** would result in a positive effect for the biological environment. However, due to the small combined area of the two MPAs (219 square miles) compared to the remaining available fishing area in the Gulf of Mexico (Gulf) (effectively, the rest of the U.S. exclusive economic zone in the Gulf), the magnitude of this positive effect is expected to be minimal.

The relationships among species in marine ecosystems are complex and poorly understood, making the nature and magnitude of ecological effects difficult to predict with any accuracy. It is possible that forage species and competitor species could increase or decrease in abundance in response to a decrease or increase in co-occurring species abundance. Although birds, dolphins, and other predators may feed on fishery discards, there is no evidence that any of these species rely on fishery discards for food. Changes in the prosecution of the reef fish and CMP fisheries are not expected from this action, so no changes in bycatch or additional effects to protected resources (see Section 3.3) are anticipated.

4.1.3 Direct and Indirect Effects on the Economic Environment

Alternative 1 (No Action) would continue to prohibit all forms of fishing within the Madison-Swanson and Steamboat Lumps Marine MPAs from November 1 – April 30 and maintain the existing surface trolling allowance (which excludes reef fish species) between May 1 and October 31. **Alternative 1** is not expected to affect the harvest or other customary uses of species managed in the Gulf. Therefore, **Alternative 1** would not be expected to result in economic effects.

Alternative 2 would eliminate the May 1-October 31 trolling allowance and therefore reinstate the year-round prohibition on surface trolling in the Madison-Swanson and Steamboat Lumps Marine MPAs. **Alternative 2** would be expected to result in adverse economic effects commensurate with the surface trolling opportunities forgone by fishermen who typically participate in this mode of fishing. These expected economic effects cannot be quantified at this time due to the absence of catch and effort data specific to trolling activities within the MPAs. However, because the Madison-Swanson and Steamboat Lumps Marine MPAs are considered as relatively poor destinations for successful surface trolling (as noted by the Gulf of Mexico Fishery Management Council's (Council) Reef Fish Advisory Panel during its October 2019 meeting), adverse economic effects expected to result from forgone trolling activities would be expected to be limited. Because the prohibition from trolling within the MPAs would also translate into a reduction in fishing pressure within the MPAs, **Alternative 2** would be expected to result in positive economic effects relative to **Alternative 1**. Although unquantifiable at this time, these potential economic benefits are expected to be commensurate with the level of reduction in fishing pressure. **Alternative 2** is expected to assist in the mitigation of illegal bottom fishing activities in the MPAs by no longer allowing seasonal surface trolling to be used as a cover for illegal fishing. Therefore, economic benefits would also be expected to result from the year-round trolling prohibition because **Alternative 2** would ease the enforcement of all fishing prohibitions within the MPAs. Net economic effects expected to result from **Alternative 2** cannot be quantified at this time due to data limitations. Relative to **Alternative 1**, it is expected that **Alternative 2** would result in positive net economic effects because the benefits from reduced fishing pressure and improved enforcement of regulations within the MPAs would be expected to outweigh adverse economic effects that would result from limited surface trolling opportunities forgone by fishermen.

4.1.4 Direct and Indirect Effects on the Social Environment

Additional effects would not be expected from **Alternative 1** and surface trolling would continue to be allowed from May 1 through October 31. By prohibiting the surface trolling that is currently allowed within the MPAs during part of the year, **Alternative 2** would thereby prohibit fishing year-round within the MPAs. (**Alternative 2** would not apply to surface trolling for HMS species.) Although negative effects would usually be expected from prohibiting fishing activity that is currently allowed due to lost opportunities, it is not likely that legal fishing is occurring. The MPAs are far from shore (Figure 1.1.1), and are not likely a practical destination for surface trolling. Thus, minimal to no negative effects on fishing activity that is currently legal would be expected under **Alternative 2**, similar to **Alternative 1**. However, compared to **Alternative 1**, some small positive effects could be expected from removing the allowance for

trolling as the intent of this action is to remove the ability for fishermen engaged in illegal fishing activity (e.g., bottom fishing for reef fish) to claim legal fishing activity (i.e., trolling) when engaged by law enforcement. These positive effects would accrue broadly to the social environment and pertain to issues of compliance and trust in enforcement.

4.1.5 Direct and Indirect Effects on the Administrative Environment

Alternative 1 (No Action) does not create any new restrictions in the MPAs and therefore does not change any exiting administrative impacts. Surface trolling is allowed from May 1 through October 31 within the boundaries of the Madison-Swanson and Steamboat Lumps MPAs. Surface trolling is defined as "fishing with lines trailing behind a vessel which is in constant motion at speeds in excess of four knots with a visible wake, and may not involve the use of downriggers, wire lines, planers, or similar devices." Fishermen will still need to be notified of the existing restricted fishing areas and fishing restrictions though regulation pamphlets, and enforcement of the offshore areas will still need to be conducted at sea by the U.S. Coast Guard and/or Florida Fish and Wildlife Conservation Commission (FWC) enforcement. There are no permit or gear requirements for fishermen other than a requirement that fishing gear (other than surface trolling gear during May through October) must be appropriately stowed while a vessel is in the restricted area (i.e., the MPA), and a vessel must be in transit if it has a species onboard that is prohibited from harvest in the restricted fishing area (e.g., a reef fish species).

Under **Alternative 2**, surface trolling would be prohibited year-round in the Madison-Swanson and Steamboat Lumps MPAs. The creation of the new prohibition to restrict fishing year-round would require notification to fishermen through revised regulation pamphlets and news releases. However, prohibiting surface trolling year-round within the MPAs may relieve some of the administrative burden on law enforcement. Under **Alternative 2**, any vessel within the MPAs would need to always have fishing gear stowed when transiting the MPAs, making it easier for law enforcement to identify non-compliance on the water. The only exemption under **Alternative 2** for having fishing gear stowed would be for vessels permitted to fish for, retain, possess and land Atlantic HMS. However, since a permit is required to harvest species managed by the Atlantic HMS Management Division of the National Marine Fisheries Service (NMFS), the absence of such a permit on a vessel with fishing gear in use within the MPAs may signal non-compliance with the regulations under **Alternative 2**.

4.2 Action 2: Modification of Prohibitions on Possession of Fish in Madison-Swanson and Steamboat Lumps MPAs

Alternative 1: No Action – Possession of Gulf reef fish year-round, or any other species of fish from November through April including coastal migratory pelagic (CMP) species, is prohibited in the Madison-Swanson and Steamboat Lumps MPAs, except on a vessel in transit with fishing gear stowed. This prohibition does not apply to Atlantic HMS.

Alternative 2: The possession of any species of fish, other than Atlantic HMS, is prohibited year-round in the Madison-Swanson and Steamboat Lumps MPAs, with no exception for vessels in transit.

Alternative 3: The possession of any species of Gulf reef fish is prohibited year-round in the Madison-Swanson and Steamboat Lumps MPAs, with no exception for vessels in transit.

4.2.1 Direct and Indirect Effects on the Physical Environment

Action 2 focuses on whether certain fish may be possessed on a vessel within the respective boundaries of the Madison-Swanson and Steamboat Lumps MPAs. Possession of a fish indicates that the act of harvesting the fish has already occurred (see Section 4.1.1 for a summary of the effects of fishing on the physical environment). Therefore, changes to the regulations as they relate to the possession of a species (**Alternatives 2** and **3**) are not expected to result in measurable changes in effects to the physical environment compared to the status quo (**Alternative 1**).

4.2.2 Direct and Indirect Effects on the Biological Environment

Action 2 focuses on possession of certain species on a vessel within the respective boundaries of the Madison-Swanson and Steamboat Lumps MPAs. Possession of a fish indicates that the act of harvesting the fish has already occurred, meaning that the effect on the biological environment from the act of harvesting the fish has already been considered. Therefore, changes to the regulations as they relate to the possession of a species (**Alternatives 2** and **3**) are not expected to result in measurable changes in effects to the biological environment compared to the status quo (**Alternative 1**).

4.2.3 Direct and Indirect Effects on the Economic Environment

Alternative 1 (No Action) would maintain the current possession restrictions and would not affect fishing behavior, harvest, or any other customary use of fishery resources. Therefore, **Alternative 1** is not expected to result in economic effects. The remaining alternatives consider modifications to possession prohibitions within the MPAs.

Alternative 2 would establish a year-round blanket prohibition from possessing any fish species other than HMS species within the MPAs. Because **Alternative 2** does not provide exceptions for vessels in transit, vessels with any fish species other than HMS onboard must adjust the trajectory of their fishing trips, possibly adding to their travel times and trip expenses (mainly fuel). Relative to **Alternative 1**, **Alternative 2** is therefore expected to result in adverse economic effects due to additional time and costs borne by vessel operators due to the restrictions on fish possession within the MPAs. However, the blanket interdiction on possession established by **Alternative 2** is expected to markedly streamline and improve the enforcement of regulations within the MPAs, thereby resulting in positive economic effects relative to **Alternative 1**.

Similar to **Alternative 2, Alternative 3** does not provide an exception for vessels transiting through the MPAs. However, **Alternative 3** is less restrictive than **Alternative 2** because it limits the prohibition of fish within the MPAs to Gulf reef fish species. **Alternative 3** would require fishermen with Gulf reef fish onboard to adjust travel itineraries and avoid transiting through the MPAs. Relative to **Alternative 1**, **Alternative 3** is therefore expected to result in adverse economic effects due to additional time and trip costs incurred by fishermen. Relative to **Alternative 1**, **Alternative 3** is also expected to result in positive economic effects due to improvements in enforcement of regulations associated with the prohibition of Gulf reef fish within the MPAs. **Alternative 2** would impose a possession prohibition for a wider range of species compared to **Alternative 3**. Relative to the no action alternative (**Alternative 1**), **Alternative 2** is therefore expected to result in larger potential adverse effects due to possible increases in time and trip costs but would also be expected to result in greater economic benefits stemming from better enforcement of regulations within the MPAs.

4.2.4 Direct and Indirect Effects on the Social Environment

Additional effects would not be expected from **Alternative 1** and possession of reef fish would continue to be allowed within the boundaries of the MPAs when vessels are in transit with fishing gear stowed; other fish could continue to be possessed from May through October, including HMS species, but from November through April possession of other fish would continue to be allowed only when the vessels are in transit with gear stowed. Although only surface trolling is currently allowed within the MPAs from May through October and the legal possession of reef fish is permitted only on vessels transiting through the MPAs, the MPAs are far from shore, where enforcement is difficult. Concerns have been expressed that vessels are bottom fishing for reef fish within the MPAs and if encountered by law enforcement, are able to conceal their illegal fishing and claim to be in transit. Some negative effects may be occurring then under **Alternative 1**, if the transit provision is allowing for illegal fishing activity to be concealed.

Some negative effects would be expected from prohibiting the possession of any Gulf reef fish year-round within the MPAs (**Alternative 3**) as transiting vessels would be required to avoid the boundaries of the MPAs (Figure 1.1.1). From 2011 through 2019, approximately 75% of the federally permitted vessels with Vessel Monitoring System (VMS) detected within the MPA boundaries were commercial reef fish vessels (Appendix B), which may have had reef fish onboard. These reef fish vessels may also have had an Atlantic HMS permit. Nearly all of the

remaining 25% of vessels had at least an Atlantic HMS permit and would not be affected by this action. For the total number of detections by all federally permitted vessels with VMS during these years, an average of 56 trips were made by vessels that entered the Madison-Swanson MPA and an average of 42 trips per year entered the Steamboat Lumps MPA. This suggests that transit by commercial reef fish vessels through the MPAs is not a common practice by a significant number of federally permitted vessels. It is unknown how many recreational vessels possessing reef fish may transit through the MPAs. However, due to the distance of the MPAs from shore, it is not likely that a significant number of recreational vessels currently transit through the MPAs. Thus, the negative effects of prohibiting the transit of vessels with reef fish aboard through the MPAs would be expected to be minimal to small. At the same time, some positive effects could result broadly to the social environment in terms of compliance and trust in law enforcement, although these effects would also be expected to be minimal.

The negative effects of prohibiting the possession of any species of fish (except HMS species) within the boundaries of the MPAs (**Alternative 2**) would likely be small but greater than prohibiting the possession of reef fish only (**Alternative 3**), because additional vessels would be prohibited from transiting the areas. However, the extent of any additional effects remains unknown as the number and frequency of commercial and recreational vessels possessing other fish besides reef fish, including CMP species and state-managed species, and intending to transit the MPAs with those fish onboard is unknown. Nevertheless, these additional negative effects would be expected to be minimal. While some positive effects would be expected for the social environment under **Alternative 3** compared to **Alternative 1**, from improved enforcement, these positive effects are not expected under **Alternative 2**, as the issues of law enforcement pertain specifically to the potential for illegal reef fish fishing.

4.2.5 Direct and Indirect Effects on the Administrative Environment

Alternative 1 (No Action) continues the prohibition of possession of Gulf reef fish year-round, or any other species of fish from November through April including CMP species, in the Madison-Swanson and Steamboat Lumps MPAs, except on a vessel in transit with fishing gear stowed. This prohibition does not apply to HMS. **Alternative 1** does not create any new restrictions and therefore does not change any existing administrative impacts. Under any alternative except **Alternative 1**, the creation of any new possession limits would require notification to fishermen through revised regulation pamphlets and news releases.

Under **Alternative 2,** the possession of any species of fish, other than HMS, is prohibited year-round in the Madison-Swanson and Steamboat Lumps MPAs, with no exception for vessels in transit. Under **Alternative 3**, the possession of any species of Gulf reef fish is prohibited year-round in the Madison-Swanson and Steamboat Lumps MPAs, with no exception for vessels in transit.

A key concern with offshore restricted fishing areas is poaching, which can reduce the effectiveness of such areas. All of the alternatives except **Alternative 1** decrease the ability to possess certain species of fish while a vessel is in the MPAs. In order of the amount of restrictions, **Alternative 2** creates the greatest restriction by not allowing the possession of any species of fish, expect Atlantic HMS. **Alternative 3** restricts only the possession of Gulf reef

fish species. **Alternative 2** results in a lesser negative administrative burden for law enforcement, as possession of any species besides HMS would constitute a violation of the law, which may be easier to visually verify than **Alternative 3**, under which only possession of Gulf reef fish species would constitute a violation of the law.

4.3 Cumulative Effects Analysis

Federal agencies preparing an environmental assessment (EA) must also consider cumulative effects of a proposed action and other actions. Cumulative effects are those effects that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions (RFFA), regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from individually minor, but collectively significant actions that take place over a period of time (40 C.F.R. 1508.7). Below is a five-step cumulative effects analysis that identifies criteria that must be considered in an EA.

1. *The area in which the effects of the proposed action will occur* - The affected area of this proposed action encompasses federal waters of the Gulf in the Madison-Swanson and Steamboat Lumps designated MPAs. Chapter 1 of this document describes the affected areas in further detail.

2. *The impacts that are expected in that area from the proposed action –*
The proposed action would modify fishing activity within the boundaries of the Madison-Swanson and Steamboat Lumps MPAs. The environmental consequences of the proposed actions are analyzed in detail in Section 4.1. Modifying fishing activity should have very little effect on the physical and biological/ecological environment because the action is not expected to alter the manner in which the reef fish fishery is prosecuted (Sections 4.1.1 and 4.1.2). These actions would likely have minor direct and indirect on the social and economic environments in the near future (Sections 4.1.3 and 4.1.4). The action is also not expected to adversely or beneficially significantly affect the administrative environment (Section 4.1.5).

3. *Other past, present and RFFAs that have or are expected to have impacts in the area* -

Other fishery related actions – The cumulative effects associated with fishing activity in the MPAs were analyzed in reef fish Amendment 21 and Amendment 30B. In addition, cumulative effects relative to reef fish management have been analyzed in the EISs for Amendment 22 (GMFMC 2004b), Amendment 26 (GMFMC 2006), and Amendment 27/14 (GMFMC 2007), Amendment 29 (GMFMC 2008a), Amendment 30A (GMFMC 2008b), Amendment 30B (GMFMC 2008c), Amendment 31 (GMFMC 2010), Amendment 40 (GMFMC 2014), and Amendment 28 (GMFMC 2015a). These cumulative effects analyses are incorporated here by reference. Other pertinent actions are summarized in the history of management (Section 1.3). Descriptions of these actions can be found on the Council's Web page.[20]

Non-fishery related actions - Forces affecting the reef fish fishery have been described in previous cumulative effect analyses (e.g., Amendment 40). Three important examples include impacts of the *Deepwater Horizon* MC252 oil spill, the Northern Gulf Hypoxic Zone, and climate change (See Sections 3.1 and 3.2).

4. The impacts or expected impacts from these other actions - Reef fish species are mobile and are able to avoid hypoxic conditions, so any effects from the Northern Gulf Hypoxic Zone on

[20] http://gulfcouncil.org/

reef fish species are likely minimal regardless of this action. Impacts from the *Deepwater Horizon* MC252 oil spill are still being examined; however, as indicated in Section 3.2, the oil spill had some adverse effects on fish species.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. The Intergovernmental Panel on Climate Change has numerous reports addressing their assessments of climate change.[21] Global climate changes could affect the Gulf fisheries as discussed in Section 3.2. However, the extent of these effects cannot be quantified at this time. The proposed action is not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing as these actions should not change how the fishery is prosecuted. As described in Section 3.2, the contribution to greenhouse gas emissions from fishing is minor compared to other emission sources (e.g., oil platforms). The cumulative effects from managing the reef fish fishery have been analyzed in other actions as listed in part three of this section. They include detailed analysis of the reef fish fishery, cumulative effects on non-target species, protected species, and habitats in the Gulf. In general, the effects of these actions are positive as they ultimately act to restore/maintain the stocks at a level that will allow the maximum benefits in yield and fishing opportunities to be achieved.

5. *The overall impact that can be expected if the individual impacts are allowed to accumulate:* This action, combined with other past actions, present actions, and RFFAs, is not expected to have significant beneficial or adverse effects on the physical and biological/ecological environments because this action will only minimally affect current fishing practices (Sections 4.1.1 and 4.1.2). However, for the social and economic environments, short-term adverse effects, although minor, are likely and could result in economic losses to fishing communities (Sections 4.1.3 and 4.1.4). These short-term effects are expected to be compensated for by long-term management goals to maintain the stock at healthy levels. These effects are likely minimal as the proposed action, along with other past actions, present actions, and RFFAs, are not expected to alter the manner in which the fishery is prosecuted. Because it is unlikely there would be any changes in how the fishery is prosecuted, this action, combined with past actions, present actions, and RFFAs, is not expected to have significant adverse effects on public health or safety.

6. Summary: The proposed action is not expected to have individual significant effects to the biological, physical, or socio-economic environment. Any effects of the proposed action, when combined with other past actions, present actions, and RFFAs are not expected to be significant. The effects of the proposed action are, and will continue to be, monitored through collection of landings data by NMFS, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations.

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

CHAPTER 5. REGULATORY IMPACT REVIEW

5.1 Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; 2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and, 3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866.

5.2 Problems and Objectives

5.3 Description of the Fishery

A description of the Gulf reef fish fishery is provided in Section 3.

5.4 Impact of Management Measures

5.5 Public and Private Costs of Regulations

5.6 Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a "significant regulatory action" if it is likely to result in: 1) an annual effect of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; 2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; 3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or 4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this E.O. Based on the information provided above, this action has been determined to not be economically significant for the purposes of E.O. 12866.

CHAPTER 6. REGULATORY FLEXIBILITY ACT ANALYSIS

6.1 Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and applicable statutes, to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration. The RFA does not contain any decision criteria; instead, the purpose of the RFA is to inform the agency, as well as the public, of the expected economic impacts of the alternatives contained in the fishery management plan (FMP) or amendment (including framework management measures and other regulatory actions) and to ensure that the agency considers alternatives that minimize the expected impacts while meeting the goals and objectives of the FMP and applicable statutes.

With certain exceptions, the RFA requires agencies to conduct a regulatory flexibility analysis for each proposed rule. The regulatory flexibility analysis is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. The following RFA was conducted to determine if the proposed rule would have a significant economic impact on a substantial number of small entities or not.

6.2 Statement of the need for, objective of, and legal basis for the proposed rule

6.3 Identification of federal rules which may duplicate, overlap, or conflict with the proposed rule

6.4 Description and estimate of the number of small entities to which the proposed action would apply

6.5 Description of the project reporting, record-keeping, and other compliance requirements of the proposed rule

6.6 Significance of economic impacts on a substantial number of small entities

CHAPTER 7. AGENCIES, ORGANIZATIONS AND PERSONS CONSULTED

The following have or will be consulted:

National Marine Fisheries Service
- Southeast Fisheries Science Center
- Southeast Regional Office
- Protected Resources
- Habitat Conservation
- Sustainable Fisheries
- Atlantic HMS Management Division

NOAA General Counsel
Environmental Protection Agency
United States Coast Guard
Texas Parks and Wildlife Department
Alabama Department of Conservation and Natural Resources/Marine Resources Division
Louisiana Department of Wildlife and Fisheries
Mississippi Department of Marine Resources
Florida Fish and Wildlife Conservation Commission

CHAPTER 8. LIST OF PREPARERS

Preparers:

Name	Expertise	Responsibility
Ryan Rindone, GMFMC	Fishery Biologist	Co-Team Lead – amendment development, introduction, physical, biological, ecological, and administrative effects
Rich Malinowski, NMFS/SF	Fishery Biologist	Co-Team Lead – amendment development, introduction, physical, biological, ecological, and administrative effects
Assane Diagne, GMFMC	Economist	Economic effects, Regulatory Impact Review
Ava Lasseter, GMFMC	Anthropologist	Social effects
Denise Johnson, NMFS/SF	Economist	Economic environment, Regulatory Flexibility Act analysis
Christina Package-Ward, NMFS/SF	Anthropologist	Social environment, Environmental Justice
Mike Larkin, NMFS/SF	Fishery Biologist, Data Analyst	Data analysis
Jen Cudney, NMFS/HMS	Fishery Biologist	Affected Environment, HMS
Jo Williams, NMFS/SEFSC	Fishery Biologist	Data analysis
James Primrose, NMFS/SEFSC	Data Specialist	VMS data compilation and review

Reviewers:

Name	Discipline/Expertise	Role in EA Preparation
Mara Levy, NOAA GC	Attorney	Legal review
Noah Silverman, NMFS	Natural Resource Management Specialist	NEPA review
David Dale, NMFS/HC	EFH Specialist	Habitat review
Jennifer Lee, NMFS/PR	Protected Resources Specialist	Protected resources review
Adam Bailey, NMFS/SF	Regulatory Writer	Regulatory preparation and review
Carrie Simmons, GMFMC	Fishery Biologist	Physical, biological, and ecological review
Sue Gerhart, NMFS/SF	Fishery Biologist	Physical, biological, and ecological review
Peter Hood, NMFS/SF	Fishery Biologist	Physical, biological, and ecological review

GMFMC = Gulf of Mexico Fishery Management Council, SAFMC = South Atlantic Fishery Management Council, NMFS = National Marine Fisheries Service, SF = Sustainable Fisheries Division, PR = Protected Resources Division, HC = Habitat Conservation Division, GC = General Counsel

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APPENDIX A. CURRENT REGULATIONS

A1 - Gulf of Mexico Reef Fishes

§622.34 Seasonal and area closures designed to protect Gulf reef fish.

(a) Closure provisions applicable to the Madison and Swanson sites and Steamboat Lumps, and the Edges -

(1) Descriptions of Areas.

(i) The Madison and Swanson sites are bounded by rhumb lines connecting, in order, the following points:

Point	North lat.	West long.
A	29°17′	85°50′
B	29°17′	85°38′
C	29°06′	85°38′
D	29°06′	85°50′
A	29°17′	85°50′

(ii) Steamboat Lumps is bounded by rhumb lines connecting, in order, the following points:

Point	North lat.	West long.
A	28°14′	84°48′
B	28°14′	84°37′
C	28°03′	84°37′
D	28°03′	84°48′
A	28°14′	84°48′

(iii) The Edges is bounded by rhumb lines connecting, in order, the following points:

Point	North lat.	West long.
A	28°51′	85°16′
B	28°51′	85°04′
C	28°14′	84°42′
D	28°14′	84°54′
A	28°51′	85°16′

(2) Within the Madison and Swanson sites and Steamboat Lumps, possession of Gulf reef fish is prohibited, except for such possession aboard a vessel in transit with fishing gear stowed as specified in paragraph (a)(4) of this section.

(3) Within the Madison and Swanson sites and Steamboat Lumps during November through April, and within the Edges during January through April, all fishing is prohibited, and possession of any fish species is prohibited, except for such possession aboard a vessel in transit with fishing gear stowed as specified in paragraph (a)(4) of this section. The provisions of this paragraph, (a)(3), do not apply to highly migratory species.

(4) For the purpose of paragraph (a) of this section, transit means non-stop progression through the area; fishing gear appropriately stowed means -

(i) A longline may be left on the drum if all gangions and hooks are disconnected and stowed below deck. Hooks cannot be baited. All buoys must be disconnected from the gear; however, buoys may remain on deck.

(ii) A trawl net may remain on deck, but trawl doors must be disconnected from the trawl gear and must be secured.

(iii) A gillnet must be left on the drum. Any additional gillnets not attached to the drum must be stowed below deck.

(iv) A rod and reel must be removed from the rod holder and stowed securely on or below deck. Terminal gear (i.e., hook, leader, sinker, flasher, or bait) must be disconnected and stowed separately from the rod and reel. Sinkers must be disconnected from the down rigger and stowed separately.

(5) Within the Madison and Swanson sites and Steamboat Lumps, during May through October, surface trolling is the only allowable fishing activity. For the purpose of this paragraph (a)(5), surface trolling is defined as fishing with lines trailing behind a vessel which is in constant motion at speeds in excess of four knots with a visible wake. Such trolling may not involve the use of down riggers, wire lines, planers, or similar devices.

(6) For the purpose of this paragraph (a), fish means finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals and birds. Highly migratory species means tuna species, marlin (*Tetrapturus spp.* and *Makaira spp.*), oceanic sharks, sailfishes (*Istiophorus spp.),* and swordfish (*Xiphias gladius*).

A2 – Atlantic Highly Migratory Species

§635.4 Permits and fees

(b) HMS Charter/Headboat permits.
(1) The owner of a charter boat or headboat used to fish for, retain, possess, or land any Atlantic HMS must obtain an HMS Charter/Headboat permit. In order to fish for, retain, possess, or land Atlantic sharks, the owner must have a valid shark endorsement issued by NMFS. A vessel issued an HMS Charter/Headboat permit for a fishing year shall not be issued an HMS Angling permit, a Swordfish General Commercial permit, or an Atlantic Tunas permit in any category for that same fishing year, regardless of a change in the vessel's ownership.

(c) HMS Angling permits.
(1) The owner of any vessel used to fish recreationally for Atlantic HMS or on which Atlantic HMS are retained or possessed recreationally, must obtain an HMS Angling permit, except as provided in paragraph (c)(2) of this section. In order to fish for, retain, possess, or land Atlantic

sharks, the owner must have a valid shark endorsement issued by NMFS. Atlantic HMS caught, retained, possessed, or landed by persons on board vessels with an HMS Angling permit may not be sold or transferred to any person for a commercial purpose. A vessel issued an HMS Angling permit for a fishing year shall not be issued an HMS Charter/Headboat permit, a Swordfish General Commercial permit, or an Atlantic Tunas permit in any category for that same fishing year, regardless of a change in the vessel's ownership.

§635.21 Gear operation and deployment restrictions.

(a) All Atlantic HMS fishing gears.
(3) Restricted gear and closed areas for all Atlantic HMS fishing gears.
(i) No person may fish for, catch, possess, or retain any Atlantic HMS or anchor a fishing vessel that has been issued a permit or is required to be permitted under this part, in the areas and seasons designated at §622.34(a)(3) of this chapter, and in the Tortugas marine reserves HAPC designated at §622.74(c) of this chapter.

(ii) From November through April of each year, no vessel issued, or required to be issued, a permit under this part may fish or deploy any type of fishing gear in the Madison-Swanson closed area or the Steamboat Lumps closed area, as defined in §635.2.

(iii) From May through October of each year, no vessel issued, or required to be issued, a permit under this part may fish or deploy any type of fishing gear in the Madison-Swanson or the Steamboat Lumps closed areas except for surface trolling. For the purposes of this section, surface trolling is defined as fishing with lines trailing behind a vessel which is in constant motion at speeds in excess of four knots with a visible wake. Such trolling may not involve the use of down riggers, wire lines, planers, or similar devices.

APPENDIX B. VESSEL MONITORING SYSTEM (VMS) TRAFFIC ANALYSIS

Analysis of Vessels entering Madison-Swanson and Steamboat Lumps Marine Protected Areas (MPAs)

In September of 2006, Amendment 18A to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico (Gulf) (Reef fish FMP) required a NOAA Fisheries-approved vessel monitoring system (VMS) to be on board all vessels with a Gulf federal commercial reef fish permit. In October of 2006, Amendment 13 to the Fishery Management Plan for the Shrimp Fishery of the Gulf (Shrimp FMP) required an electronic logbook to be on board all selected vessels with a Gulf shrimp permit. In August of 2011, there was an updated regulation for Atlantic highly migratory species (HMS) that required VMS for vessels fishing commercially for Atlantic HMS (76 FR 75492). All VMS data from 2010 to 2019 was reviewed by the NOAA Fisheries Office of Enforcement, and any data from fishing vessels that entered either the Madison-Swanson or Steamboat Lumps MPAs were provided to the Southeast Regional Office on February 19, 2020. VMS data from 2010 was removed because of the spatial and temporal closures in the Gulf of Mexico from the *Deepwater Horizon* oil spill.

A review of the VMS-MPA data resulted in 168 different vessels generating a total of 878 trips (502 trips inside Madison-Swanson and 376 trips inside Steamboat Lumps). The total trips into both MPAs by month were greatest in May, June, and August (Figure B1). A review of the total trips per year were greatest in 2011, 2013, and 2017 (Figure B2). The different types of vessels that entered the MPAs were broken down into five vessel categories (charter for-hire, Gulf commercial reef fish, HMS, rock shrimp, and no permit information available), and the majority of vessels in the MPAs were vessels with Gulf commercial reef fish vessels (Figure B3).

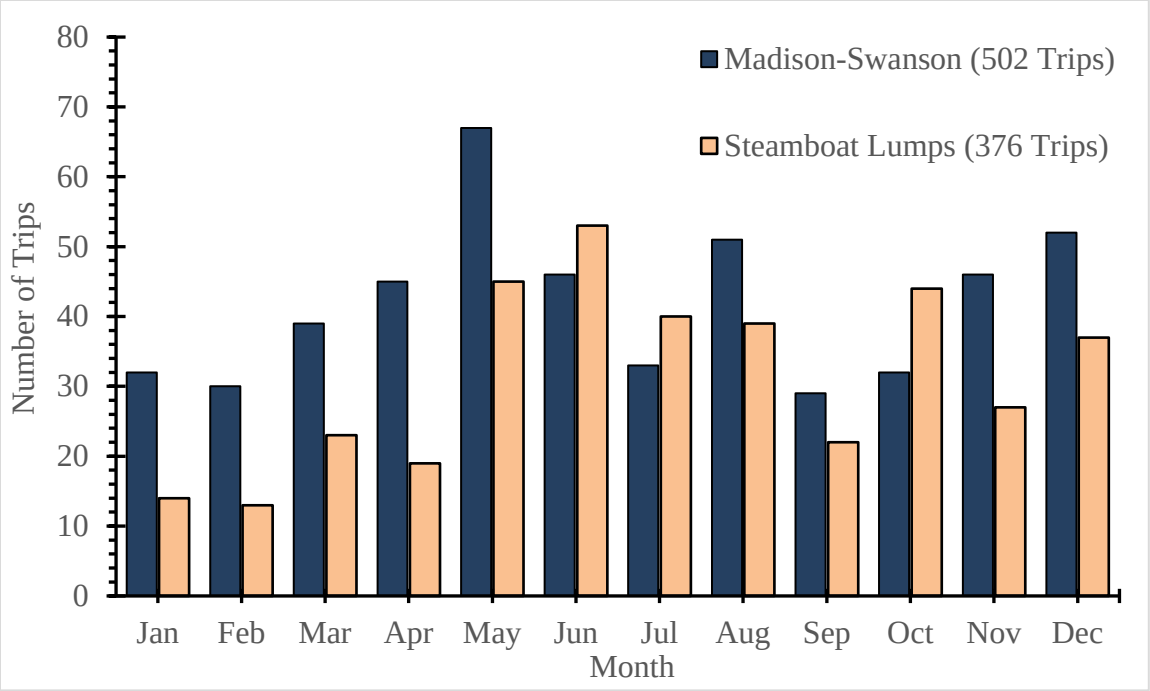

Figure B1. The number of trips recorded by VMS that entered Madison-Swanson and Steamboat Lumps from 2011 through 2019 by month.

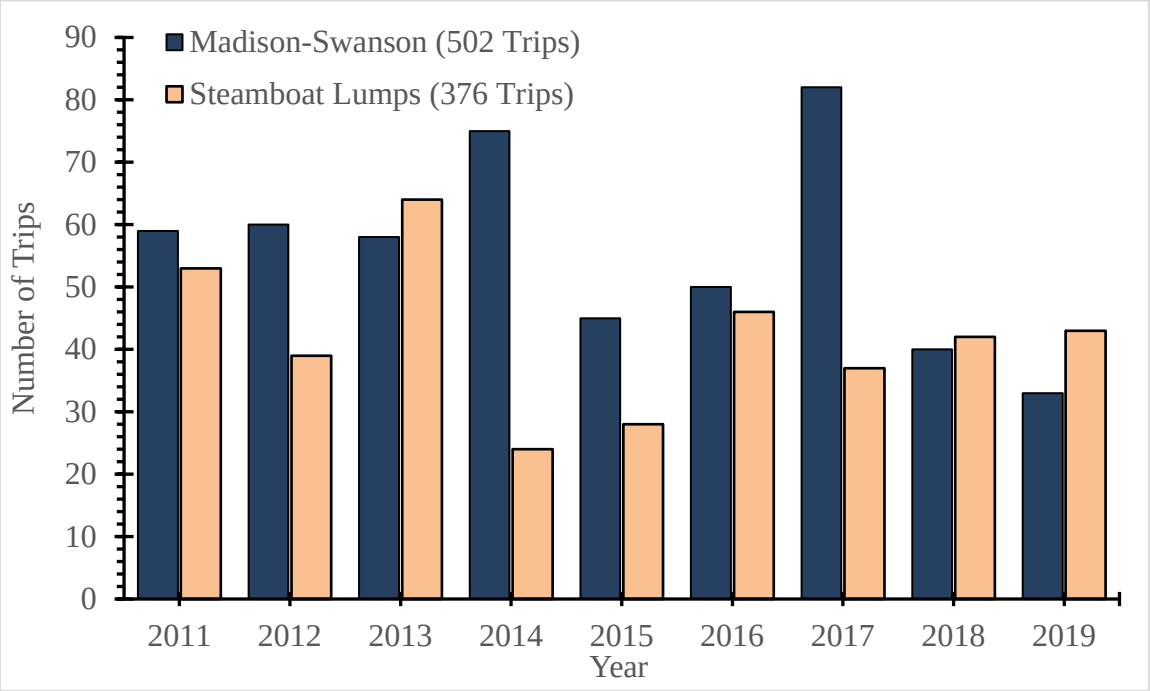

Figure B2. The number of trips recorded by VMS that entered Madison-Swanson and Steamboat Lumps from 2011 through 2019 by year.

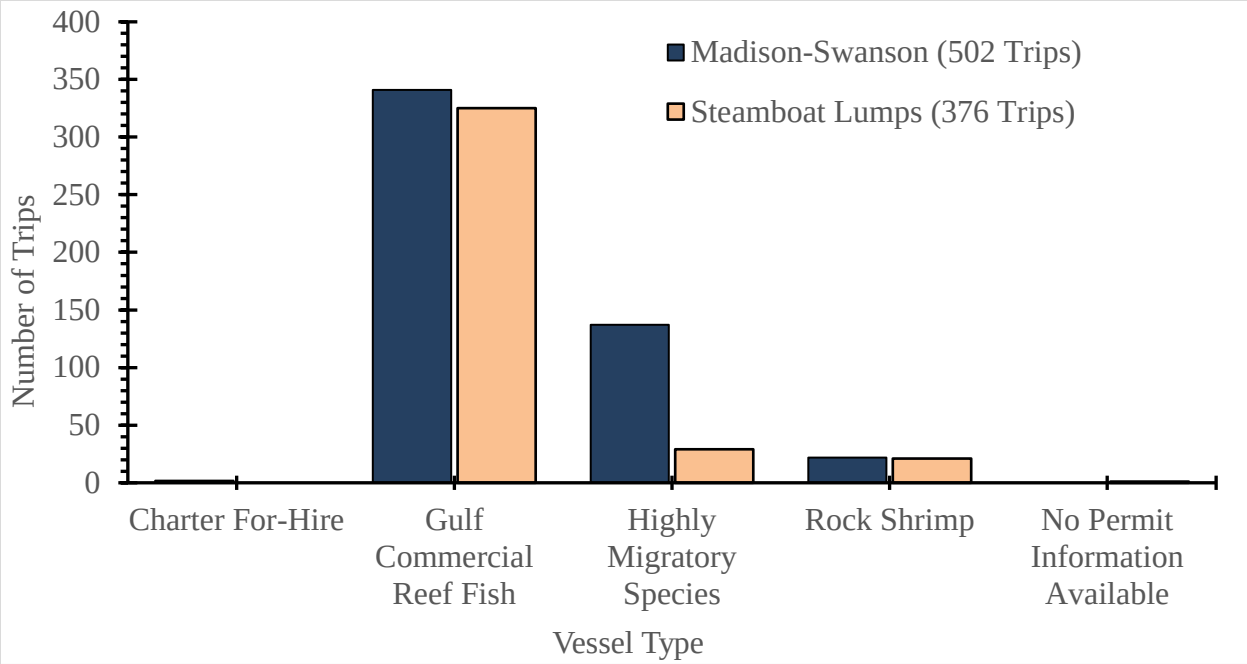

Figure B3. The number of trips recorded by VMS that entered Madison-Swanson and Steamboat Lumps from 2011 through 2019 by vessel type.

The VMS on board the federally permitted vessels sends position reports once an hour and occasionally more than one detection in an hour. The time period each trip spent inside each of the MPAs were summarized using the available detections. Figure B4 provides the distribution of time spent inside the MPAs. Most of the trips (44%) only had a single detection inside the MPA indicating these vessels were only briefly inside the MPAs. There were 244 trips (27%) that were detected more than once inside the MPA but spent one hour or less inside the MPAs. There were also 85 trips (10%) that spent more than 10 hours inside the MPAs.

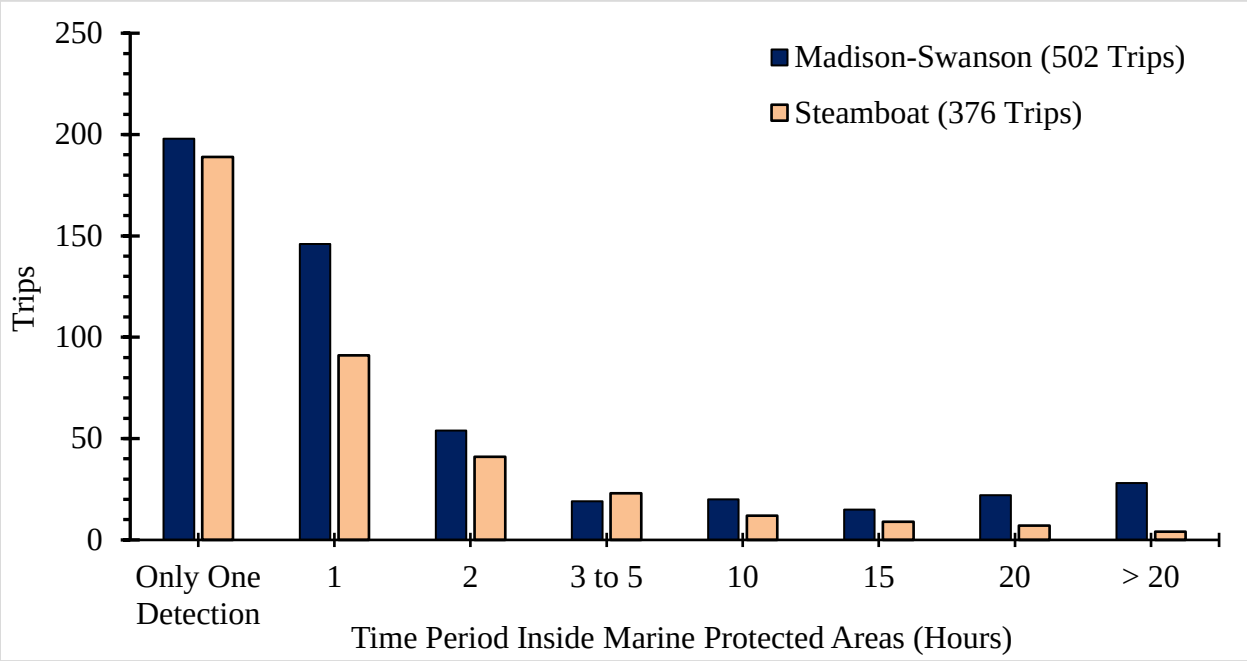

Figure B4. The amount of time that elapsed for vessels detected inside Madison-Swanson and Steamboat Lumps from 2011 through 2019.

Looking at the VMS-MPA data it was assumed that any trips detected inside the MPA for longer than 10 hours were likely not trolling through, but instead were probably focusing fishing effort inside the MPAs. The trips inside the MPA for more than 10 hours were isolated which resulted in 65 trips inside Madison Swanson and 20 trips inside Steamboat Lumps. The vessel types of the trips inside the MPAs for more than 10 hours are shown in Figure B5 with 95% of the trips being from Gulf commercial reef fish vessels. The month that these trips occurred was also examined because in June 2004, Amendment 21 to the Reef Fish FMP[22] created an allowance for surface trolling inside the MPAs from May 1 through October 31 but all other forms of fishing are prohibited inside the MPAs from November 1 through April 30. Therefore, following Amendment 21, there should not be any vessels inside the MPAs for extensive periods of time from November 1 through April 30. The trips that spent more than 10 hours inside the MPAs were plotted by month in Figure B6. There were trips spending more than 10 hours inside the MPAs in the months of November to April with 39 trips in Madison-Swanson and 8 trips inside the Steamboat Lumps. These trips came from different vessels with 8 different vessels causing the 39 trips in Madison-Swanson and 7 different vessels causing the 8 trips inside the Steamboat Lumps.

[22] https://gulfcouncil.org/wp-content/uploads/RF-Amend-21-Final-2003-09.pdf

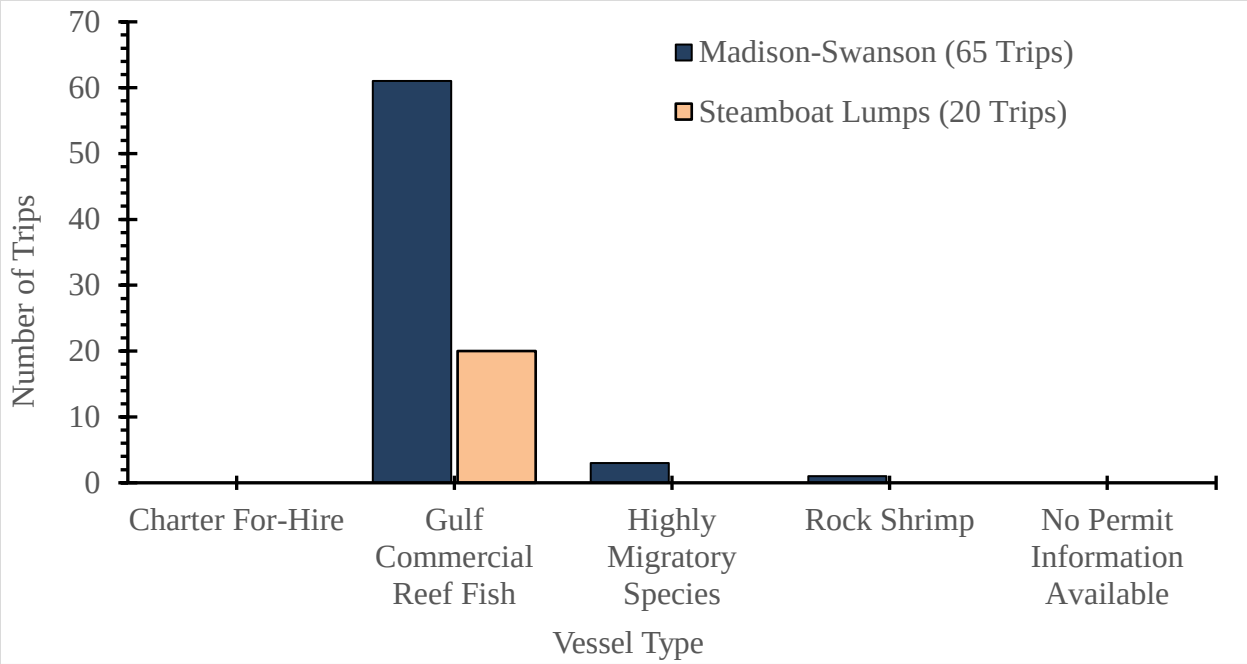

Figure B5. The number of trips recorded by VMS that entered and spent more than 10 hours inside either Madison-Swanson or Steamboat Lumps from 2010 through 2019 by vessel type.

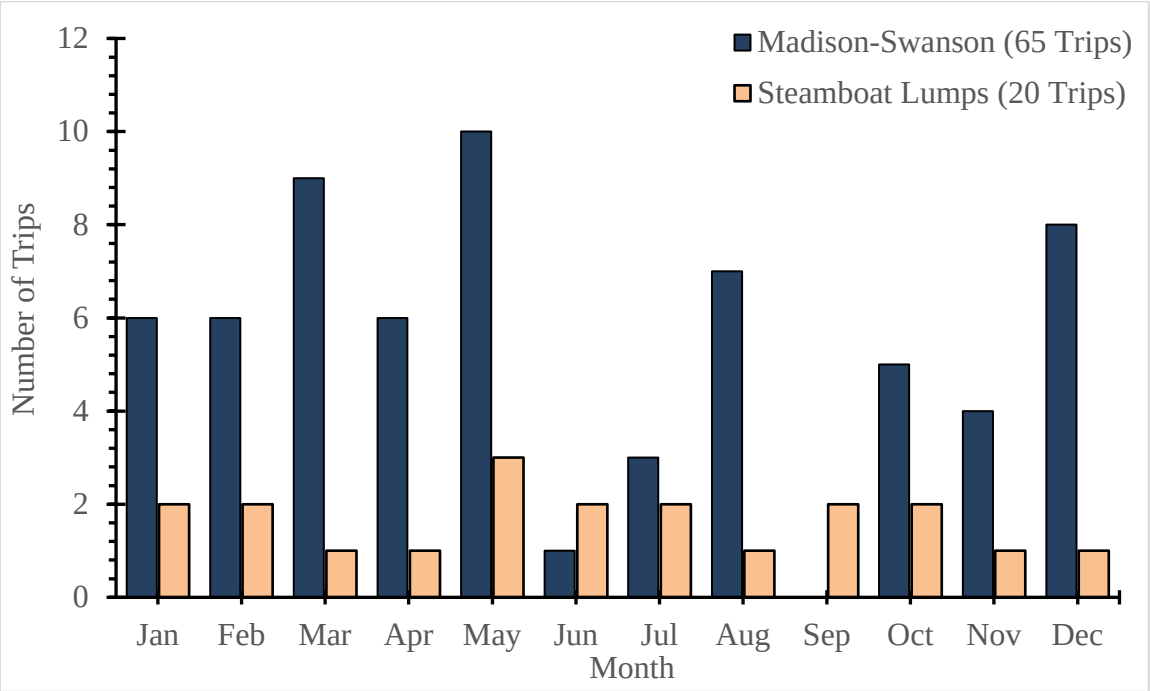

Figure B6. The number of trips recorded by VMS that entered and spent more than 10 hours inside either Madison-Swanson or Steamboat Lumps from 2010 through 2019 by month.

APPENDIX C. ELECTRONIC LOGBOOK AND SHRIMP VESSEL ACTIVITY ANALYSIS

The Southeast Fisheries Science Center (SEFSC) reviewed the number of federally-permitted shrimp vessels that were detected in the Madison-Swanson or Steamboat Lumps MPAs from 2010 through 2019. The vessel's electronic logbook (ELB) detection rate were captured in 10-minute intervals.

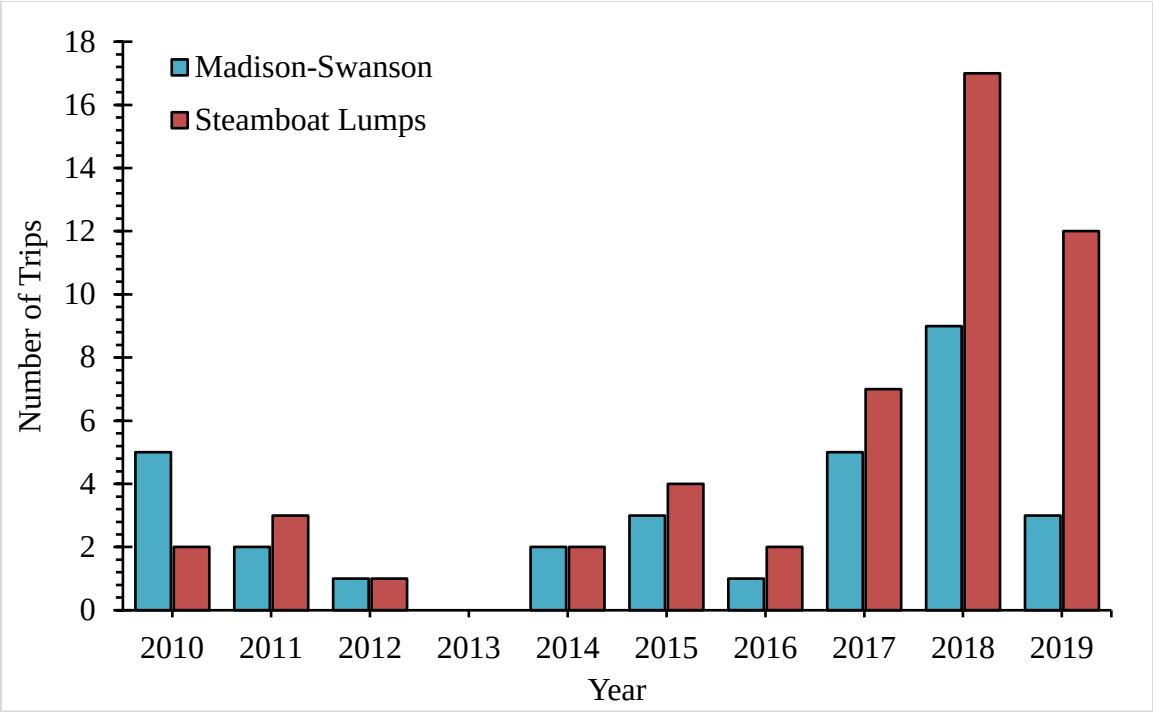

Figure C1. The number of trips recorded by Shrimp Vessels with ELBs that entered Madison-Swanson and Steamboat Lumps from 2010 through 2019 by year.

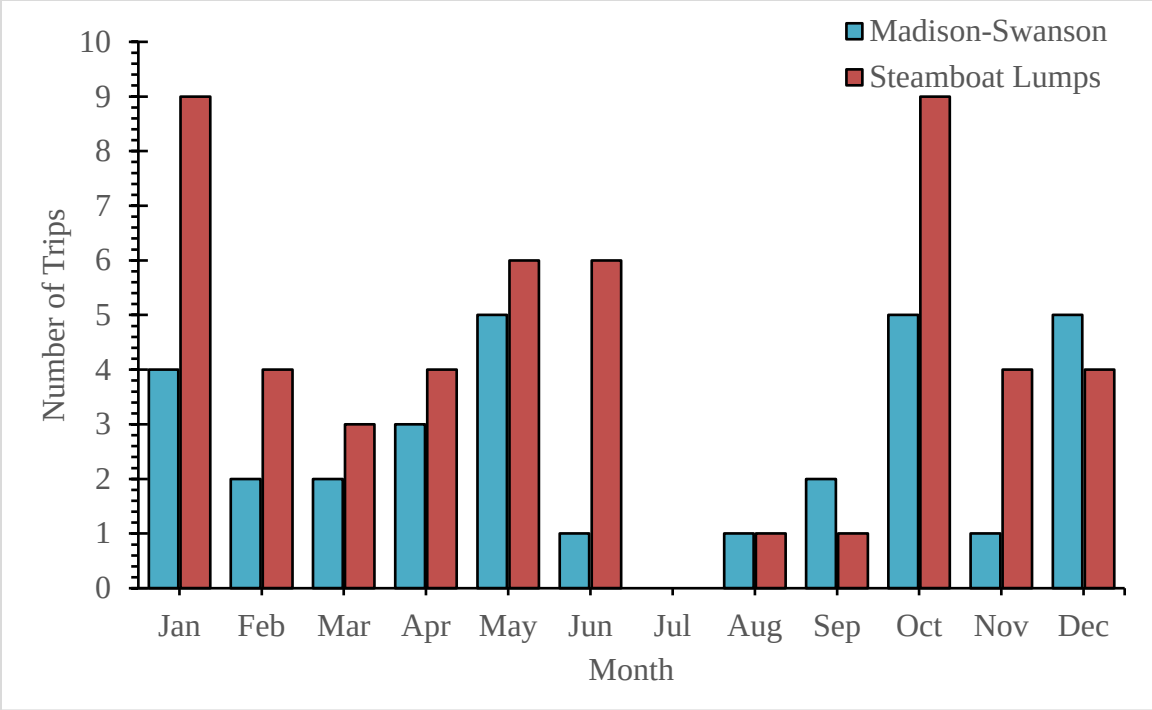

Figure C2. The number of trips recorded by Shrimp Vessel with ELBs that entered Madison-Swanson and Steamboat Lumps from 2010 through 2019 by month.

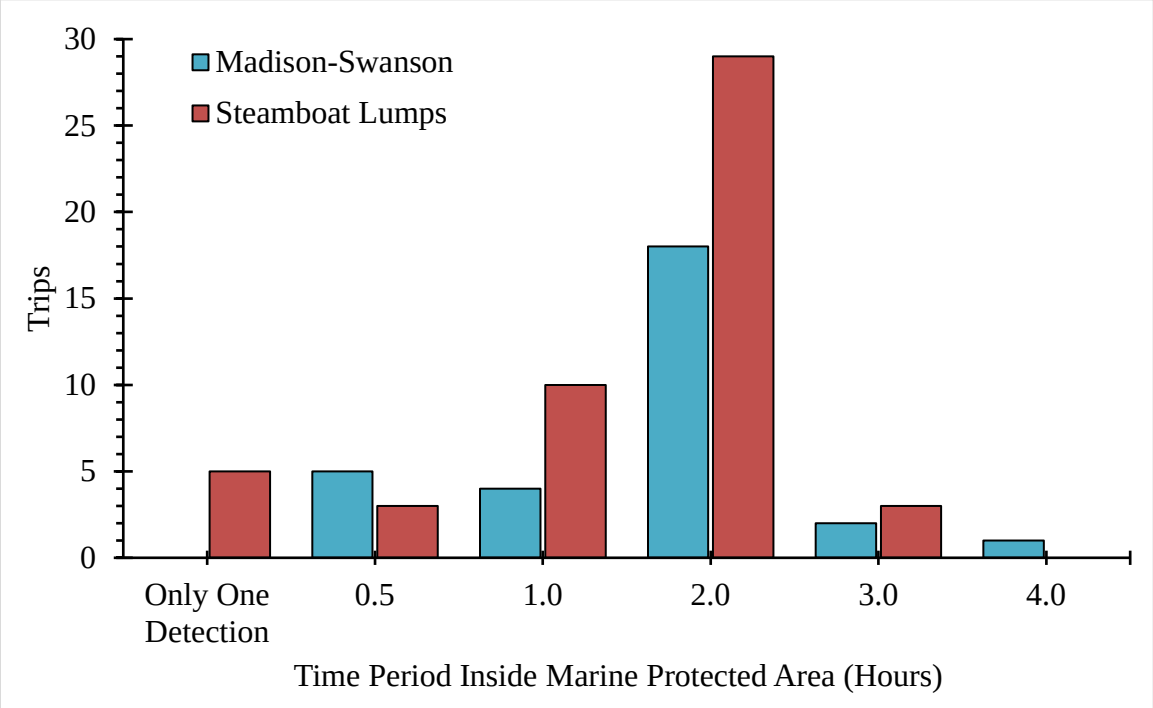

Figure C3. The number of trips recorded by Shrimp Vessels with ELBs that entered Madison-Swanson and Steamboat Lumps from 2010 through 2019 by time spent in MPAs.

APPENDIX D. PUBLIC COMMENTS RECEIVED