Modifications to the Gulf of Mexico Migratory Group King Mackerel Catch Limits

Framework Amendment 11 under the Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region

Including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis

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ENVIRONMENTAL ASSESSMENT COVER SHEET

Framework Amendment 11 to Modify Gulf of Mexico Migratory Group King Mackerel Catch Limits

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

ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
ALS	accumulated landings system
AM	accountability measure
ASFMC	Atlantic States Marine Fisheries Commission
BiOP	biological opinion
CMP	coastal migratory pelagics
CHTS	Coastal Household Telephone Survey
CS	consumer surplus
Councils	Gulf of Mexico and South Atlantic Fishery Management Councils
DPS	distinct population segment
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
EJ	environmental justice
ESA	Endangered Species Act
FES	(mail-based) fishing effort survey
FL	fork length
FMP	fishery management plan
GDP	gross domestic product
GMFMC	Gulf of Mexico Fishery Management Council
Gulf	Gulf of Mexico
Gulf Council	Gulf of Mexico Fishery Management Council
HAPC	habitat area of particular concern
IPCC	Intergovernmental Panel on Climate Change
LHWG	Life History Working Group
MMPA	Marine Mammal Protection Act
MRIP	Marine Recreational Information Program
MSY	maximum sustainable yield
NARW	North Atlantic right whales
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Agency
NOR	net operating revenue
OFL	overfishing limit
OY	optimum yield
PAH	polycyclic aromatic hydrocarbons
PS	producer surplus
RQ	regional quotient
SAFMC	South Atlantic Fishery Management Council
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center

SEFSC-SSRG	Southeast Fisheries Science Center Social Science Research Group
SERO	NMFS Southeast Regional Office
South Atlantic Council	South Atlantic Fishery Management Council
SSC	Scientific and Statistical Committee
VOC	volatile organic compounds
ww	whole weight
lw	landed weight

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CHAPTER 1. INTRODUCTION

1.1 Background

Framework Amendment 11 to the Fishery Management Plan (FMP) for Coastal Migratory Pelagic (CMP) Resources of the Gulf of Mexico and Atlantic Region (CMP FMP) is being developed by the Gulf of Mexico (Gulf) Fishery Management Council (Gulf Council) to address the results of the Southeast Data Assessment and Review (SEDAR) 38 Update (2020) stock assessment and subsequent overfishing limit (OFL) and acceptable biological catch (ABC) recommendations from the Gulf Council's Scientific and Statistical Committee (SSC). Framework Amendment 11 proposes revisions to the Gulf migratory group of king mackerel OFL, ABC, and the total and sector annual catch limits (ACL).

King mackerel is managed jointly by the Gulf Council and South Atlantic Fishery Management Council (South Atlantic Council; together: "Councils") under the CMP FMP. Two migratory groups of king mackerel are managed in the southeastern US: the Atlantic migratory group (Atlantic king mackerel) and the Gulf migratory group (Gulf king mackerel). Prior to the 2016/2017 fishing season, management measures included shifting management boundaries depending on the time of year in recognition of a seasonal mixing zone between the Gulf and Atlantic king mackerel stocks. The current stock and management boundaries were established in May 2017 in Amendment 26 to the CMP FMP (GMFMC and SAFMC 2016), and are shown in Figure 1.1.1.

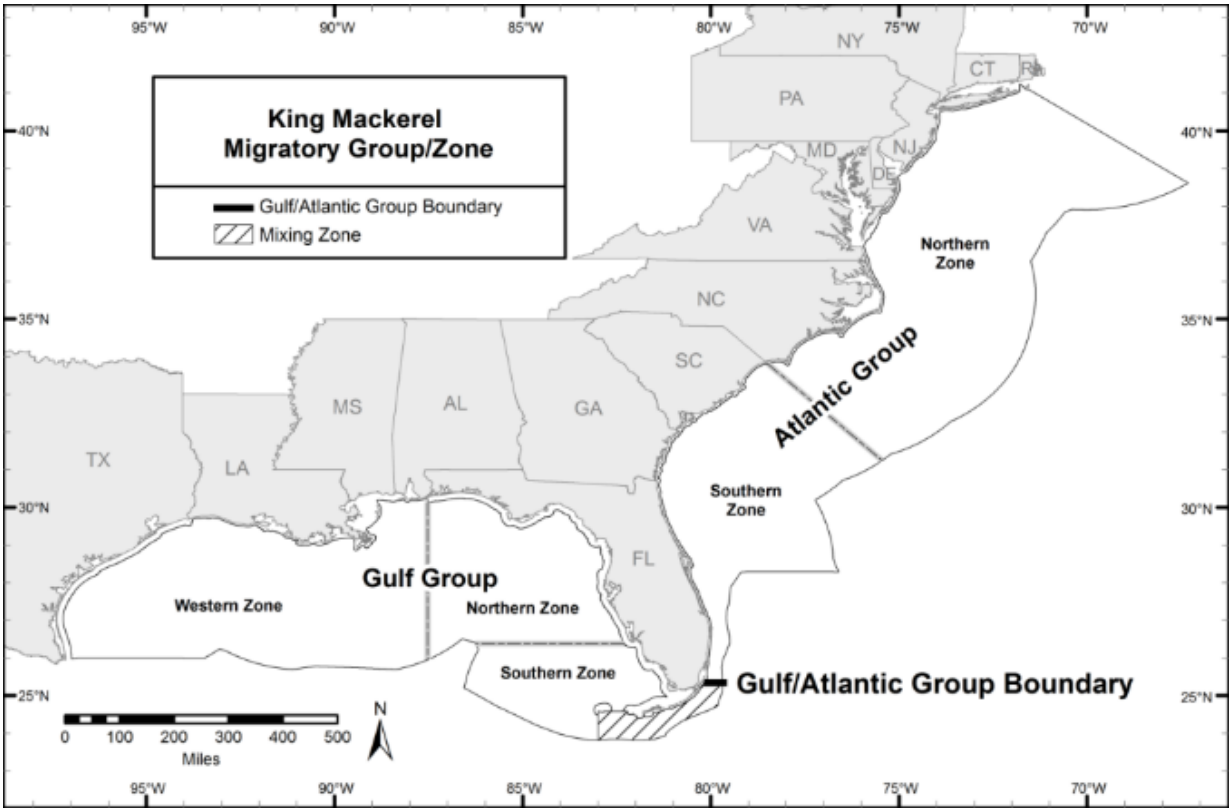

Figure 1.1.1. Gulf and Atlantic king mackerel stock boundaries as currently used for management purposes by the Councils. The Gulf is divided into commercial management Zones, which are managed by the Gulf Council, and includes the mixing zone (hashed area). The South Atlantic Council management area is divided into a Northern and Southern Zone, extending north to the easternmost tip of Long Island, New York.

Migratory Groups

Gulf king mackerel is found from Texas to the Miami-Dade/Monroe County line in southeastern Florida, and includes a seasonal mixing zone south of U.S. Highway 1 in the Florida Keys (Figure 1.1.1). This mixing zone occurs between November 1 and April 30, where king mackerel from the Gulf and Atlantic migratory groups are thought to mix (SEDAR 38 2014). The Gulf Council is responsible for establishing management measures for Gulf king mackerel, which includes the fish in the mixing zone; the South Atlantic Council is responsible for establishing management measures for Atlantic king mackerel within its jurisdiction excluding the fish in mixing zone (GMFMC and SAFMC 2016). This amendment focuses only on Gulf king mackerel; therefore, there will be no further discussion of Atlantic king mackerel.

Gulf King Mackerel

Found from Texas to the Miami-Dade/Monroe County Line in southeastern Florida. Management authority is given to the Gulf Council; however, Gulf king mackerel is jointly managed between the Gulf and South Atlantic Councils.

Sector Allocations

The total ACL is divided 68% to the recreational sector, and 32% to the commercial sector. Two percent of the commercial allocation is intended to accommodate the sale of king mackerel by the for-hire component of the recreational sector.

Commercial Zones

Three management zones are established for Gulf king mackerel: the Western zone, which extends from Texas to the Florida-Alabama state line; the Northern Zone, which extends from the Florida-Alabama state line south to the Monroe/Collier County Line in southwestern Florida; and, the Southern Zone, which extends from Monroe/Collier County Line east to the Miami-Dade/Monroe County line in southeastern Florida and is made up of hook-and-line and gillnet components.

Allocations

Within the Gulf, king mackerel is managed with sector allocations, dividing the total stock ACL with 32% going to the commercial sector and 68% going to the recreational sector. These sector allocations, established in Amendment 1 to the CMP FMP (GMFMC and SAFMC 1985), used the average of available commercial and recreational landings data from the years 1975 – 1979. At that time, it was determined the recreational fishery accounted for approximately 70% of harvest, and the commercial fishery approximately 30%. However, the recreational allocation was reduced to 68% to allow for recreational catch that was sold by the for-hire component of the recreational sector and counted against the commercial allocation. This 2% shift is still included in the current sector allocations for Gulf king mackerel. The Gulf Council is currently developing CMP Amendment 33, which considers modifications to the sector allocations for Gulf king mackerel. Because the manner in which the commercial and recreational fleets fish for king mackerel is largely the same, and because of similarities between the sizes and ages of fish retained by each fleet are similar, changes in the sector allocation for Gulf king mackerel do not affect the catch projections from the SEDAR 38 Update, which are considered in this framework amendment.

In the Gulf, the total commercial allocation (32%) is divided between three zones across two fishing fleets. The three commercial fishing zones are the Western (40%), Northern (18%), and Southern Zone (42%) (see Figure 1.1.1). Handline (hook-and-line) fishing for Gulf king mackerel is permitted in all three zones. Run-around gillnet fishing for Gulf king mackerel is permitted only in the Southern Zone. The Southern Zone commercial allocation is split equally

between the hook-and-line and run-around gillnet components (21% each). The Gulf Council is not currently considering modifying commercial zone allocations.

Gulf King Mackerel Landings

The Gulf king mackerel fishing year for the recreational sector and commercial sector Western and Southern Zone is July 1 – June 30. The Southern Zone gillnet component has a fixed closed season from July 1 until the Tuesday after Martin Luther King Jr. Day. The fishing year for the commercial sector Northern Zone is October 1 – September 30. These fishing years are used to monitor landings with SSC recommended calendar year catch limits being attributed to the fishing year with that calendar year as the first part of the fishing year. For example, the 2022 SSC recommended catch limits would be attributed to the 2022/2023 fishing year.

The Gulf king mackerel total ACL is monitored in pounds (lbs) of landed weight (lw), that is, combined whole and gutted weight. The total Gulf king mackerel ACL, and prior to 2012 (GMFMC and SAFMC 2011)[1], the total allowable catch ("TAC"), has not been exceeded in the past 20 years (Table 1.1.1). The ACL is currently monitored using the Marine Recreational Information Program's (MRIP) Coastal Household Telephone Survey (CHTS) data currency. Recently, estimates of recreational catch and effort were calibrated to MRIP's more contemporary Fishing Effort Survey (FES) data currency, which is considered to be the best scientific information available. The landings provided in this document include recreational landings in both units for reference; however, a direct comparison between units cannot be made due to differences in the fishing effort assumed under each data currency. A more detailed description of the recent changes to the collection of recreational catch and effort data can be found in Appendix A.

Commercial harvest of Gulf king mackerel has been subject to changes in the mixing zone and management boundaries (see CMP Amendment 26, GMFMC and SAFMC 2016). Commercial landings from the 2001/2002 – 2015/2016 fishing years are compared to the commercial and total ACLs in effect for those fishing years, and include landings from the former Florida East Coast Subzone (Table 1.1.1). The Florida East Coast Subzone was removed in the 2016/2017 fishing year with the implementation of Amendment 26 to the CMP FMP, which changed the mixing zone and redefined the management boundary (GMFMC and SAFMC 2016). Commercial landings by zone for the commercial sector since the 2001/2002 fishing year are provided in Table 1.1.2.

[1] CMP Amendment 18 changed the way the catch limits for Gulf king mackerel were described. Previously, a "total allowable catch", or TAC, was used to describe what is now known as the total stock ACL. This TAC included a commercial quota, divided by the Gulf commercial zones and gears, and a recreational allocation. After CMP Amendment 18 was implemented, a total stock ACL was divided into commercial and recreational ACLs, and the commercial ACL into commercial zone/gear quotas. For more information: https://gulfcouncil.org/wp-content/uploads/Final-CMP-Amendment-18-092311-w-o-appendices-1.pdf

Table 1.1.1. Gulf king mackerel recreational (lbs ww) and commercial landings (lbs lw) under the current sector allocation (32% commercial, 68% recreational), recreational landings in MRIP-CHTS and MRIP-FES, the recreational ACL in MRIP-CHTS, the commercial ACL, total landings using MRIP-CHTS and MRIP-FES units, and the total Gulf migratory group ACL in MRIP-CHTS, for the fishing years 2001/2002 – 2019/2020. Only the Total Landings (CHTS) should be compared to the Total ACL (CHTS). FES equivalent landings are provided for reference only.

Year	Rec. Landings (CHTS)	Rec. Landings (FES)	Rec. ACL (CHTS)	Com. Landings	Com. ACL	Total Landings (CHTS)	Total Landings (FES)	Total ACL (CHTS)
2001/02	3,941,457	9,070,883	6,936,000	2,840,657	3,264,000	6,782,114	11,911,540	10,200,000
2002/03	2,983,798	6,169,130	6,936,000	3,032,207	3,264,000	6,016,005	9,201,337	10,200,000
2003/04	3,498,288	6,823,391	6,936,000	3,042,219	3,264,000	6,540,507	9,865,610	10,200,000
2004/05	2,564,642	5,339,214	6,936,000	3,140,596	3,264,000	5,705,238	8,479,810	10,200,000
2005/06	2,465,383	4,781,778	6,936,000	2,889,115	3,264,000	5,354,498	7,670,893	10,200,000
2006/07	3,319,495	6,074,882	7,344,000	3,121,321	3,456,000	6,440,816	9,196,203	10,800,000
2007/08	2,464,224	4,871,760	7,344,000	3,357,297	3,456,000	5,821,521	8,229,057	10,800,000
2008/09	2,790,428	5,168,997	7,344,000	3,913,176	3,456,000	6,703,604	9,082,173	10,800,000
2009/10	3,261,388	7,939,505	7,344,000	3,706,798	3,456,000	6,968,186	11,646,303	10,800,000
2010/11	1,993,088	5,497,642	7,344,000	3,473,388	3,456,000	5,466,476	8,971,030	10,800,000
2011/12	2,012,068	5,060,923	7,344,000	3,374,877	3,456,000	5,386,945	8,435,800	10,800,000
2012/13	3,224,351	6,856,317	7,344,000	3,501,893	3,456,000	6,726,244	10,358,210	10,800,000
2013/14	2,082,852	3,948,649	7,344,000	3,236,234	3,456,000	5,319,086	7,184,883	10,800,000
2014/15	4,015,683	7,777,977	7,344,000	3,753,959	3,456,000	7,769,642	11,531,936	10,800,000
2015/16	2,531,260	4,812,866	7,344,000	3,642,992	3,456,000	6,174,252	8,455,858	10,800,000
2016/17	2,587,187	4,986,684	6,260,000	2,902,360	2,950,000	5,489,547	7,889,044	9,210,000
2017/18	2,356,343	5,210,721	6,040,000	3,031,397	2,840,000	5,387,740	8,242,118	8,880,000
2018/19	2,338,564	5,044,834	5,920,000	2,780,813	2,790,000	5,119,377	7,825,647	8,710,000
2019/20	1,622,334	3,238,966	5,810,000	2,658,942	2,740,000	4,281,276	5,897,908	8,550,000

Source: SEFSC Commercial ACL data (August 9, 2021). Recreational SEFSC Recreational ACL data (Accessed May 10, 2021).

Note: The Gulf king mackerel fishing year for the recreational sector and commercial sector Western and Southern Zone is July 1 – June 30. The fishing year for the commercial sector Northern Zone is October 1 – September 30. The total ACL was reduced in the 2016/17 fishing year due to the results of SEDAR 38 (2014) and the mixing zone changing with fish being reallocated to the Atlantic king mackerel migratory group that were previously allotted to the Gulf king mackerel migratory group.

Table 1.1.2. Gulf king mackerel commercial landings (lbs lw) by Zone.

Year	Northern Handline	East FL Handline	Southern Gillnet	Southern Handline	Western Handline	Com. Landings	Com. ACL	% ACL landed
2001/02	222,916	696,927	316,814	702,997	901,003	2,840,657	3,264,000	87.0%
2002/03	148,115	859,471	349,924	724,848	949,849	3,032,207	3,264,000	92.9%
2003/04	186,341	802,588	458,194	613,714	981,382	3,042,219	3,264,000	93.2%
2004/05	105,108	685,242	645,985	609,903	1,094,358	3,140,596	3,264,000	96.2%
2005/06	140,989	674,599	491,046	714,921	867,560	2,889,115	3,264,000	88.5%
2006/07	159,083	852,903	468,044	620,290	1,021,001	3,121,321	3,456,000	90.3%
2007/08	214,417	1,050,525	586,800	555,902	949,653	3,357,297	3,456,000	97.1%
2008/09	276,998	1,072,243	845,017	734,118	984,800	3,913,176	3,456,000	113.2%
2009/10	287,838	1,082,279	589,462	706,442	1,040,777	3,706,798	3,456,000	107.3%
2010/11	341,775	1,059,660	522,267	637,974	911,712	3,473,388	3,456,000	100.5%
2011/12	267,958	1,037,290	437,040	622,864	1,009,725	3,374,877	3,456,000	97.7%
2012/13	216,184	887,989	498,609	810,156	1,088,955	3,501,893	3,456,000	101.3%
2013/14	246,110	754,215	595,382	611,227	1,029,300	3,236,234	3,456,000	93.6%
2014/15	100,051	1,059,527	543,730	686,285	1,364,366	3,753,959	3,456,000	108.6%
2015/16	182,600	1,049,259	529,745	658,723	1,222,665	3,642,992	3,456,000	105.4%
2016/17	473,282		538,213	731,655	1,159,210	2,902,360	2,950,000	98.4%
2017/18	538,274		552,775	872,203	1,068,145	3,031,397	2,840,000	106.7%
2018/19	397,926		604,700	687,587	1,090,600	2,780,813	2,790,000	99.7%
2019/20	324,971		517,481	628,486	1,188,004	2,658,942	2,740,000	97.0%

Source: SEFSC Commercial ACL data (August 9, 2021). The East Florida handline component was included in the Gulf king mackerel commercial ACL until the 2015/16 fishing season.

SEDAR 38 Update Stock Assessment

At its September 2020 meeting, the Gulf Council's SSC reviewed the results and projections from the SEDAR 38 Update (2020) stock assessment report, prepared by the Southeast Fisheries Science Center (SEFSC). A key change in this stock assessment was the use of recreational catch and effort data calibrated to the MRIP-FES, which replaced MRIP-CHTS in 2018, and resulted in increased estimates of both recreational landings and fishing effort (see Appendix A). SEDAR 38 Update estimated that Gulf king mackerel is not overfished and not undergoing overfishing as of the 2017/2018 fishing year, which ended June 30, 2018. The SEDAR 38 Update predicted that landings (i.e., the 2020/2021 total ACL of 8.55 million pounds [mp] whole weight [ww]) can be maintained with a low probability of overfishing in the short-term. The overfished stock status determination criteria, the minimum stock size threshold (MSST), is equal to (1-M) * SSB_{MSY}, where M (natural mortality) = 0.174 and the spawning stock biomass at maximum sustainable yield (SSB_{MSY}) = $SSB_{SPR30\%}$, where SPR means spawning potential ratio (Amendment 16 to the CMP FMP; GMFMC and SAFMC 2003). As of the 2017/2018 fishing year, the stock was being harvested at 84% of the overfishing status determination

criteria, the maximum fishing mortality threshold (MFMT), and SSB was 112% of MSST. After reviewing the SEDAR 38 Update results, the Gulf Council's SSC determined that the scientific uncertainty was not adequately captured by the buffer between the OFL and ABC using the ABC control rule. The SEFSC also noted that the scientific uncertainty in the SEDAR 38 Update base model is larger than that produced by the PDFs, and that a percentage of the MSY proxy may be more appropriate for determining the difference between the OFL and ABC. Therefore, the SSC used the projected yield at F_{OY} ($0.85*F_{SPR30\%}$) to determine the ABC. The Gulf Council's SSC determined the results to be the best scientific information available for Gulf king mackerel, noting that the stock is not overfished or undergoing overfishing as of the 2017/2018 fishing year. The 2020/2021 landings and total ACL are recorded and monitored, respectively, in MRIP-CHTS units. The updated catch advice by the SSC for the OFL and ABC for the 2021/2022 – 2023/2024 and subsequent fishing years is in MRIP-FES units, and increases annually through the 2023/24 fishing years (Table 1.1.3). With respect to the increase in the recommended catch limits compared to the current catch limits, that difference is largely attributable to converting the recreational catch and effort data to the MRIP-FES data currency. Had MRIP-FES recreational data been available to provide catch advice in SEDAR 38 in 2014, the current catch limit recommendations from SEDAR 38 Update would represent an average 19% decrease in allowable catch due to model correction of the virgin biomass estimate (see Appendix B) and decreased recruitment in recent years.

Table 1.1.3. Catch limits for Gulf king mackerel stock for 2021/2022 – 2023/2024 and subsequent fishing years, as recommended by the Gulf Council's SSC in September 2020. Values are in lbs ww and MRIP-FES.

Fishing Year	OFL	ABC
2021 (attributed to 2021/2022 FY)	10,890,000	9,370,000
2022 (attributed to 2022/2023 FY)	11,050,000	9,720,000
2023 (attributed to 2023/2024+ fishing years)	11,180,000	9,990,000

Proposed Management Modifications

At its October 2020 meeting, the Gulf Council began work on Amendment 33 to the CMP FMP, to modify the OFL, ABC, and ACLs for Gulf king mackerel in response to the results of the SEDAR 38 Update and the Gulf Council SSC's subsequent catch recommendations. The Gulf Council also decided through Amendment 33 to review the current commercial/recreational allocation and consider modifications to this allocation.. At its January 2022 meeting, the Council decided to consider catch limit modifications for Gulf king mackerel in a framework amendment, separate from the consideration of sector allocations, in order to implement those catch limit modifications in a timelier manner than is expected for a plan amendment addressing reallocation. Historically, the commercial sector has met or exceeded the commercial ACL (Table 1.1.2) while the recreational sector has landed low proportions of the recreational ACL (Table 1.1.1). At the March 2015 Gulf Council CMP Advisory Panel (Gulf CMP AP) meeting, members recommended an increase for the Gulf king mackerel recreational bag limit as a way to

potentially increase utilization of the Gulf king mackerel recreational ACL. This increase to the recreational bag limit went into effect in May 2017 (Amendment 26; GMFMC and SAFMC 2016). However, recreational landings are relatively unchanged since the implementation of the increased recreational bag limit (Table 1.1.1.). Therefore, the Gulf Council does not expect the change from MRIP-CHTS to MRIP-FES to impact recreational fishing opportunities.

SEFSC Simulation of Historic Gulf King Mackerel Landings

The Gulf Council requested an analysis of the SEDAR 38 and SEDAR 38 Update base models to determine what the ABC would have been, assuming MRIP-FES data had been used in both stock assessments (Appendix B). The purpose of this simulation was to allow the Council to conceptualize the effects of the estimated increase in historical recreational fishing effort on the historical catch limits, under this constrained hypothetical scenario. The SEFSC completed this simulation and delivered it to the Council in March 2021. This simulation consists of four models: [Model 1] the original SEDAR 38 base model, with a data terminal year of 2012; [Model 2] the SEDAR 38 base model using MRIP-FES for private recreational landings through the original SEDAR 38 data terminal year of 2012, and the 2012 estimate of shrimp bycatch; [Model 3] the SEDAR 38 base model using MRIP-FES for private recreational landings through the original SEDAR 38 data terminal year of 2012, and the updated 2020 estimate of shrimp bycatch; and [Model 4] the SEDAR 38 Update base model, which used MRIP-FES for private recreational landings through 2017, and the 2020 estimate of shrimp bycatch. For the purpose of comparing the effects of using MRIP-FES in the historical SEDAR 38 base model with the current SEDAR 38 Update base model, it is most appropriate to compare Models 3 and 4, as they both also incorporate updated shrimp bycatch. This comparison best limits the differences in the input data in the models to just the terminal year of data used (2012 in Model 3, and 2017 in Model 4). Comparison of this simulation to the proposed catch limits can be reviewed in Chapter 2.

1.2 Purpose and Need

The purpose of this amendment is to revise the catch limits for Gulf migratory group king mackerel in response to new information on the stock provided in the SEDAR 38 Update stock assessment.

The need for this amendment is to ensure catch limits are based on the best scientific information available, to prevent overfishing while achieving optimum yield, and to increase social and economic benefits for the king mackerel component of the CMP fishery through sustainable harvest in accordance with provisions set forth in the Magnuson-Stevens Fishery Conservation and Management Act.

1.3 History of Management

The **CMP FMP**, with environmental impact statement (EIS) and regulatory impact review (RIR), was approved in 1982 and implemented by regulations effective in February 1983 (GMFMC and SAFMC 1983). The management unit includes king mackerel, Spanish mackerel, and cobia. The CMP FMP treated king and Spanish mackerel as unit stocks in the Atlantic and

Gulf. The original CMP FMP also established a Gulf king mackerel poundage allocation, which was approximately 75.7% recreational, 24.3% commercial, based on a total allowable catch (TAC) of 3.7 mp. A history of management for all CMP species can be found in CMP **Amendment 18** (GMFMC and SAFMC 2011), **Amendment 20B** (GMFMC and SAFMC 2014), and **Amendment 26** (GMFMC and SAFMC 2016) and are incorporated here by reference. A complete history of management for CMP species is provided on the Gulf Council website.[2] The following management actions relate specifically to allocations and catch limits for Gulf king mackerel.

Amendment 1, with EIS and RIR, implemented in September 1985, revised the Gulf king mackerel maximum sustainable yield (MSY) downward, recognized separate Atlantic and Gulf migratory groups of king mackerel, and established sector allocations of 32% commercial and 68% recreational for Gulf king mackerel. These allocations were based on the average commercial and recreational landings from 1975 – 1979; the years for which complete data for both sectors were available, and including a shift of 2% of the recreational allocation to the commercial sector to account for sales of king mackerel by the for-hire component of the recreational sector. Commercial allocations among gear users were eliminated. The Gulf commercial allocation for king mackerel was divided into eastern and western zones for the purpose of regional allocation.

A **May 1986 Regulatory Amendment**, with RIR, implemented in July 1986, set a TAC for Gulf king mackerel at 2.9 mp with 0.93 mp commercial quota and 1.97 mp recreational allocation for the 1986/87 season (July 1 – June 30). The commercial quota was allocated 6% for purse-seines, 64.5% for eastern zone (Florida) and 29.5% for western zone (AL-TX).

A **May 1987 Regulatory Amendment**, with RIR, implemented in June 1987, set a TAC for Gulf king mackerel at 2.2 mp with 0.7 mp commercial quota and 1.5 mp recreational allocation for the 1987/88 season. The commercial quota was set at zero for purse-seines.

A **May 1988 Regulatory Amendment**, with RIR, implemented in July 1988, set a TAC for Gulf king mackerel at 3.4 mp with 1.1 mp commercial quota and 2.3 mp recreational allocation for the 1988/89 season. The commercial quota was allocated 69% to eastern zone (FL) and 31% to western zone (AL-TX).

A **May 1989 Regulatory Amendment**, with RIR, implemented in July 1989, set a TAC for Gulf king mackerel at 4.25 mp with 1.36 mp commercial quota and 2.89 mp recreational allocation for the 1989/90 season.

Amendment 5, with environmental assessment (EA) and RIR, implemented in August 1990, provided that the Gulf Council will be responsible for managing the Gulf migratory groups of CMP species. The two recognized Gulf migratory groups of king mackerel continued to be managed as one until management measures appropriate to the eastern and western Gulf groups could be determined.

[2] https://gulfcouncil.org/fishery-management/implemented-plans/coastal-migratory-pelagics/

A **May 1990 Regulatory Amendment**, with RIR, implemented in August 1990, retained the TAC for Gulf king mackerel at 4.25 mp with 1.36 mp commercial quota and 2.89 mp recreational allocation for the 1990/91 season.

A **May 1991 Regulatory Amendment**, with RIR, implemented in September 1991, retained the TAC for Gulf king mackerel at 5.75 mp with 1.84 mp commercial quota and 3.91 mp recreational allocation for the 1991/92 season. The amendment also set the overfishing thresholds at 30% spawning potential ratio (SPR).

A **May 1992 Regulatory Amendment**, with RIR, implemented in September 1992, set the TAC for Gulf king mackerel at 7.8 mp with 2.5 mp commercial quota and 5.3 mp recreational allocation for the 1992/93 season.

Amendment 6, with EA and RIR, and regulatory flexibility analysis (RFA), implemented in December 1992, provided for rebuilding overfished stocks of mackerels within specific periods; provided for biennial assessments and adjustments; and, allowed for Gulf king mackerel stock identification and allocation when appropriate.

A **May 1993 Regulatory Amendment**, with RIR, implemented in November 1993, retained the TAC for Gulf king mackerel at 7.8 mp with 2.5 mp commercial quota and 5.3 mp recreational allocation for the 1993/94 season.

A **May 1994 Regulatory Amendment**, with RIR, implemented in November 1994, retained the TAC for Gulf king mackerel at 7.8 mp with 2.5 mp commercial quota and 5.3 mp recreational allocation for the 1994/95 season.

Amendment 7, with EA, RIR, and RFA, implemented in November 1994, equally divided the Gulf commercial allocation in the Eastern Zone at the Dade-Monroe County line in Florida. The sub-allocation for the area from Monroe County through Western Florida was equally divided between commercial hook-and-line and gillnet users.

A **May 1995 Regulatory Amendment**, with EA, RIR, and RFA, implemented in November 1995, retained the TAC for Gulf king mackerel at 7.8 mp with 2.5 mp commercial quota and 5.3 mp recreational allocation for the 1994/95 season.

A **May 1996 Regulatory Amendment**, with EA, RIR, and RFA, implemented in June 1997, retained the TAC for Gulf king mackerel at 7.8 mp with 2.5 mp commercial quota and 5.3 mp recreational allocation for the 1996/97 season.

A **May 1997 Regulatory Amendment**, with EA, RIR, and RFA, implemented in February 1998, set the TAC for Gulf king mackerel at 10.6 mp with 3.39 mp commercial quota and 7.21 mp recreational allocation for the 1997/98 season.

A **May 1998 Regulatory Amendment**, with EA, RIR, and RFA, implemented in February 1998, retained the TAC for Gulf king mackerel at 10.6 mp with 3.39 mp commercial quota and 7.21 mp recreational allocation for the 1998/99 season.

Amendment 8, with EA, RIR, and RFA, implemented in March 1998, established the Council's intent to evaluate the impacts of permanent jurisdictional boundaries between the Gulf Council and the South Atlantic Council and separate FMPs for CMP species in these areas; and set an optimum yield (OY) target at 30% static SPR.

A **July 1999 Regulatory Amendment**, with EA, RIR, and RFA, implemented in September 1999, retained the TAC for Gulf king mackerel at 10.6 mp with 3.39 mp commercial quota and 7.21 mp recreational allocation for the 1999/2000 season.

Amendment 9, with EA, RIR, and RFA, implemented in April 2000, reallocated the percentage of the commercial allocation of the TAC for the North Area (Florida east coast) and South/West Area (Florida west coast) of the Eastern Zone to 46.15% North and 53.85% South/West, as well as retain the recreational and commercial allocations of TAC at 68% recreational and 32% commercial; subdivided the commercial hook-and-line king mackerel allocation for the Gulf Eastern Zone, and South/West Area (Florida west coast) by establishing 2 subzones with a dividing line between the 2 subzones at the Collier/Lee County line; established regional allocations for the west coast of Florida based on the 2 subzones with 7.7% of the Eastern Zone allocation of TAC being allowed from Subzone 2 and the remaining 92.3% being allocated as follows: 50% – Florida east coast, 50% – Florida west coast, 50% – gillnet fishery, 50% – hook-and-line fishery.

A **July 2000 Regulatory Amendment**, with EA and RIR, implemented in April 2001, reduced the TAC for Gulf king mackerel to 10.2 mp with 3.26 mp commercial quota and 6.94 mp recreational allocation for the 2000/2001 season.

Amendment 16/July 2003 Regulatory Amendment, with EA, RIR, and RFA, implemented in April 2004, established definitions of MSY, OY, the overfishing threshold, and the overfished condition for Gulf king mackerel.

Amendment 18, with EA, RIR, and RFA, implemented in January 2012, established ACLs and accountability measures (AM) for Gulf king mackerel.

Amendment 26, with EA, RIR, and RFA, implemented in May 2017, created a single year-round regulatory boundary between the Gulf and South Atlantic migratory groups of king mackerel at a line extending east from the Miami-Dade/Monroe County, Florida boundary. The amendment also removed the Gulf Florida East Coast subzone, renamed the zones in the Gulf, and revised the Gulf king mackerel ACLs and commercial zone quotas (Western Zone 40%, Northern Zone 18%, Southern Zone Handline component 21%; and Southern Zone Gillnet component 21%). Finally, the amendment increased the recreational bag limit to 3-fish per person.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action: Modify the Gulf of Mexico (Gulf) Migratory Group King Mackerel (Gulf King Mackerel) Overfishing Limit (OFL), Acceptable Biological Catch (ABC), and Annual Catch Limit (ACL).

Alternative 1: No Action. Retain the current OFL, ABC, and total ACL for Gulf king mackerel as established in Amendment 26 to the Fishery Management Plan (FMP) for Coastal Migratory Pelagic (CMP) Resources in the Gulf of Mexico and Atlantic Regions (CMP FMP). The Gulf king mackerel total ACL is equal to the ABC recommended by the Gulf Scientific and Statistical Committee (SSC) for 2015/2016 – 2019/2020 and subsequent fishing years.

Fishing Year	OFL	ABC	Total ACL	Rec ACL	Comm ACL
2019/2020+	8,950,000	8,550,000	8,550,000	5,810,000	2,740,000
2019/2020+ MRIP-FES equivalent	11,960,000	11,540,000	11,540,000	7,847,200	

Catch limit values are in pounds landed weight (lw)
Note: The recreational portion of the current OFL, ABC, and ACL is based on Marine Recreational Information Program (MRIP) Coastal Household Telephone Survey (CHTS) data. The recreational portion of the MRIP Fishing Effort Survey (FES) equivalent was calculated in 2021 by the Southeast Fisheries Science Center (SEFSC) and is provided for comparison only. There is not an equivalent MRIP-FES commercial ACL since the effort estimation for the commercial sector is unchanged.

Alternative 2: Revise the OFL and ABC for Gulf king mackerel as recommended by the Gulf SSC for 2021/2022 – 2023/2024 and subsequent fishing years. Retain the total ACL being set equal to the ABC; an annual catch target (ACT) is not used.

Fishing Year	OFL	ABC	Total ACL	Rec ACL	Comm ACL
2021/2022	10,890,000	9,370,000	9,370,000	6,371,600	2,998,400
2022/2023	11,050,000	9,720,000	9,720,000	6,609,600	3,110,400
2023/2024+	11,180,000	9,990,000	9,990,000	6,793,200	3,196,800

Catch limit values are in lbs lw. Note: OFL and ABC as recommended by the Gulf SSC in lbs ww. The recreational portion of the OFL, ABC, and ACL are based on MRIP-FES data.

Note: Landings are reported in landed weight, meaning whole weight and gutted weight are combined. Therefore, while the OFL, and ABC were recommended by the Gulf Council SSC in lbs ww, ACLs and quotas will be in landed weight consistent with current regulations.

Discussion:

The alternatives in this action apply to the Gulf king mackerel stock, which refers to the king mackerel landed from the Texas/Mexico border to the Miami-Dade/Monroe County line in southeastern Florida.

The Southeast Data Assessment and Review (SEDAR) 38 Update assessment (2020) incorporated recreational landings data from the Marine Recreational Information Program's (MRIP) Fishing Effort Survey (FES), and indicated that Gulf king mackerel was not overfished or undergoing overfishing. The Gulf of Mexico Fishery Management Council's (Gulf Council) SSC determined SEDAR 38 Update to be the best scientific information available and recommended increasing yields for the OFL and ABC for the 2021/2022 – 2023/2024 that are in MRIP-FES units. The OFL is set at the yield using the fishing mortality rate (F) at the maximum sustainable yield (MSY) which, in the case of Gulf king mackerel, is set at the proxy value of 30% of the spawning potential ratio (i.e., the projected yield at $F_{SPR30\%}$). To account for scientific uncertainty, the ABC is set lower than the OFL as the projected yield at 85% of the $F_{SPR30\%}$. This value for the ABC also corresponds to the definition of optimum yield (OY) for Gulf king mackerel. Amendment 18 to the CMP FMP set the ACL as equal to ABC (GMFMC and SAFMC 2011) as did Amendment 26 to the CMP FMP(GMFMC and SAFMC 2016).

Amendment 26 did not consider adopting a buffer between the Gulf king mackerel total ACL and the ABC (GMFMC and SAFMC 2016) because: 1) it was highly improbable that the Gulf king mackerel stock ACL would be met and unlikely the recreational ACL would be reached; 2) there was no indication at the time that Gulf king mackerel was overfished or experiencing overfishing; and, 3) setting the ACL equal to the ABC would provide the commercial sector with the greatest opportunity to increase their catch with the associated benefits. The Gulf king mackerel OFL has not been exceeded in the past 20 years. For these same reasons, the Gulf Council is not considering a buffer between the ABC and ACL in this amendment.

The Gulf Council has not used an ACT as a management measure for Gulf king mackerel because combined sector landings have regularly been below the total ACL. Thus, an ACT is not considered in this amendment, in keeping with the Gulf Council's determination that managing to the ACL would provide the greatest economic and social benefits to both sectors and to the Nation with negligible biological consequences.

Alternative 1 (No Action) retains the existing OFL, ABC, and total ACL, all of which are based on the previous Gulf king mackerel stock assessment (SEDAR 38 2014). The ACL is equal to the ABC, as specified in Amendment 26 to the CMP FMP (GMFMC and SAFMC 2016). The OFL, ABC, and total ACL in **Alternative 1** are based, in part, on MRIP-CHTS data. One of the major changes between the SEDAR 38 (2014) and SEDAR 38 Update (2020) base models is the incorporation of the MRIP-FES adjustments to the recreational catch and effort estimates, which are considered by the National Marine Fisheries Service to be the best scientific information available for Gulf king mackerel. Therefore, retaining the OFL, ABC and total ACL under **Alternative 1**, which are based on MRIP-CHTS data, would be inconsistent with National Standard 2 of the Magnuson-Stevens Fishery Conservation and Management Act. The catch limits in **Alternative 1** also do not reflect the Gulf Council SSC's OFL and ABC recommendation based on SEDAR 38 Update.

Alternative 2 would modify the catch limits for Gulf king mackerel based on the recommendations of the Gulf Council's SSC from the SEDAR 38 Update. The revised Gulf king mackerel catch limits are consistent with the MRIP-FES transition in the recreational catch and effort data. The Gulf Council requested an analysis of the SEDAR 38 and SEDAR 38 Update base models to determine what the ABC would have been, assuming MRIP-FES data had been used in both stock assessments (Appendix B). A summary comparison of this analysis against the published total ABC (which is equal to the total ACL) in MRIP-CHTS units is shown in Table 2.1.1. This table compared Model 3 from the analysis in Appendix B, which demonstrates the ABC from the SEDAR 38 Update base model, had that model used a terminal year of 2012, MRIP-FES recreational catch and effort data, and the updated median estimate of shrimp fishery bycatch. Model 3 represents a scenario which would have generated the catch limits for the 2015/2016 – 2019/2020 and subsequent fishing years, had all of the updated data been available for the SEDAR 38 (2014) stock assessment (MRIP-FES landings, and the shrimp bycatch as revised for the SEDAR 38 Update). Table 2.1.1 demonstrates that had MRIP-FES data and the updated median estimate of shrimp bycatch been used to set catch limits for the 2015/2016 and subsequent fishing seasons, those catch limits would have been higher than both the catch limits recommended by the SSC for the 2015/2016 – 2019/2020 and subsequent fishing years, and those in **Alternative 2** of Action 1.

Table 2.1.1. Analysis of SEDAR 38 (2014) and SEDAR 38 Update (2020) model performance by the SEFSC for the Gulf Council. Model 3 represents the SEDAR 38 Update base model, with a terminal fishing year of 2012/2013, using MRIP-FES recreational catch and effort data and the 2020 median shrimp bycatch estimate used in the original SEDAR 38 Update (2020) base model.

Fishing Year	Model 3 ABC (lbs ww) MRIP-FES	SEDAR 38 ABC (lbs ww) MRIP-CHTS	M3 - S38 (lbs ww)	SEDAR 38U ABC (lbs ww) MRIP-FES	M3 - S38U (lbs ww) MRIP-FES
2015/2016	11,830,000	10,800,000	1,030,000		
2016/2017	11,660,000	9,210,000	2,450,000		
2017/2018	11,580,000	8,880,000	2,700,000		
2018/2019	11,540,000	8,710,000	2,830,000		
2019/2020	11,540,000	8,550,000	2,990,000		
2020/2021	11,540,000	8,550,000	2,990,000		
2021/2022	11,540,000	8,550,000	2,990,000	9,370,000	2,170,000
2022/2023	11,540,000	8,550,000	2,990,000	9,720,000	1,820,000
2023/2024	11,530,000	8,550,000	2,980,000	9,990,000	1,540,000

Alternative 2 sets the total ACL equal to the Gulf Council's SSC's recommendation for the ABC for the 2021/2022 – 2023/2024 fishing years, and then maintains the ABC and total ACL at the 2023/2024 level for subsequent years until changed by future management action. An ACT is not used. Historical Gulf king mackerel landings that are adjusted to MRIP-FES currency using the current sector allocation of 32% commercial and 68% recreational have exceeded the recommended 2022/2023 ABC and total ACL in **Alternative 2** (earliest SSC-recommended catch limits could be implemented) 5 times, and the 2023/2024+ ABC and total ACL 4 times (the highest of the 2021/2022 – 2023/2024 SSC-recommended catch limits), in the last 20 years (Table 2.1.2). However, none of the recommended catch limits (i.e., OFL, ABC, stock ACL,

total recreational ACL, total commercial ACL) have been exceeded since the commercial Florida East Coast Subzone was removed and the mixing zone and management boundary was updated in the 2016/2017 fishing year. If sector allocations remain unchanged, future fleet selectivity and harvest rates are expected to remain similar, resulting in the total ACL not being harvested. This breakdown in Table 2.1.2 only compares these landings to the second and last years of the proposed projections; it is expected, based on the pace of amendment development, that these new catch limits for Gulf king mackerel, if implemented, are not likely to be in effect prior to the 2023/2024 fishing year start on July 1, 2023. However, it is possible that new catch limits could be implemented before the end of the 2022/2023 fishing year. The breakdown of the OFL, ABC, total ACL, and recreational ACL under **Alternative 2** is demonstrated in Table 2.1.3. Commercial ACL and zone ACLs based on the data in Table 2.1.3, are in Table 2.1.4.

Table 2.1.2. Gulf king mackerel recreational (in MRIP-CHTS and MRIP-FES units) and commercial (Zones combined) landings in lbs lw using current sector allocation (32% commercial, 68% recreational), total landings using MRIP-CHTS or MRIP-FES units, and the total Gulf migratory group proposed ACLs for 2022/2023 and 2023/2024+ in MRIP-FES, for the fishing years 2001/2002 – 2019/2020.

Year	Rec. Landings (CHTS)	Rec. Landings (FES)	Com. Landings	Total Landings (CHTS)	Total Landings (FES)	Proposed 2022/2023 ACL (FES)	Proposed 2023/2024+ ACL (FES)
2001/2002	3,941,457	9,070,883	2,840,657	6,782,114	11,911,540	9,720,000	9,990,000
2002/2003	2,983,798	6,169,130	3,032,207	6,016,005	9,201,337	9,720,000	9,990,000
2003/2004	3,498,288	6,823,391	3,042,219	6,540,507	9,865,610	9,720,000	9,990,000
2004/2005	2,564,642	5,339,214	3,140,596	5,705,238	8,479,810	9,720,000	9,990,000
2005/2006	2,465,383	4,781,778	2,889,115	5,354,498	7,670,893	9,720,000	9,990,000
2006/2007	3,319,495	6,074,882	3,121,321	6,440,816	9,196,203	9,720,000	9,990,000
2007/2008	2,464,224	4,871,760	3,357,297	5,821,521	8,229,057	9,720,000	9,990,000
2008/2009	2,790,428	5,168,997	3,913,176	6,703,604	9,082,173	9,720,000	9,990,000
2009/2010	3,261,388	7,939,505	3,706,798	6,968,186	11,646,303	9,720,000	9,990,000
2010/2011	1,993,088	5,497,642	3,473,388	5,466,476	8,971,030	9,720,000	9,990,000
2011/2012	2,012,068	5,060,923	3,374,877	5,386,945	8,435,800	9,720,000	9,990,000
2012/2013	3,224,351	6,856,317	3,501,893	6,726,244	10,358,210	9,720,000	9,990,000
2013/2014	2,082,852	3,948,649	3,236,234	5,319,086	7,184,883	9,720,000	9,990,000
2014/2015	4,015,683	7,777,977	3,753,959	7,769,642	11,531,936	9,720,000	9,990,000
2015/2016	2,531,260	4,812,866	3,642,992	6,174,252	8,455,858	9,720,000	9,990,000
2016/2017	2,587,187	4,986,684	2,902,360	5,489,547	7,889,044	9,720,000	9,990,000
2017/2018	2,356,343	5,210,721	3,031,397	5,387,740	8,242,118	9,720,000	9,990,000
2018/2019	2,338,564	5,044,834	2,780,813	5,119,377	7,825,647	9,720,000	9,990,000
2019/2020	1,622,334	3,238,966	2,658,942	4,281,276	5,897,908	9,720,000	9,990,000

Source: SEFSC Commercial ACL data (August 9, 2021). Recreational SEFSC Recreational ACL data (Accessed May 10, 2021 [CHTS] and May 11, 2021 [FES]).
Note: Red cells indicate when that column's proposed ACL would have been exceeded. The Gulf king mackerel fishing year for the recreational sector and commercial sector Western and Southern Zone is July 1 – June 30. The fishing year for the commercial sector Northern Zone is October 1 – September 30.

Table 2.1.3. Recreational catch limits for Gulf king mackerel for Alternative 2 based on current allocation of 68% recreational and 32% commercial compared to 2019/2020+ MRIP-FES equivalent for Alternative 1. Recreational catch limits are expressed as lbs lw. The current catch limits are provided for comparison only. The recreational catch limits are in MRIP-FES units.

Fishing Year	OFL	ABC	Total ACL	Rec ACL
Current 2019/2020+ (MRIP-FES equiv.)	11,960,000	11,540,000	11,540,000	7,847,200
2021/2022	10,890,000	9,370,000	9,370,000	6,371,600
2022/2023	11,050,000	9,720,000	9,720,000	6,609,600
2023/2024+	11,180,000	9,990,000	9,990,000	6,793,200

Table 2.1.4. Gulf commercial zone-specific catch limits for Gulf king mackerel for Alternative 2 based on current allocation of 68% recreational and 32% commercial compared to 2019/2020+ commercial catch limits Alternative 1. Catch limits are expressed as lbs lw. The current fishing year catch limits are provided for comparison only. HL = handline; GN = Gillnet.

Fishing Year	Comm ACL	Handline Total				
		Western Zone HL	Northern Zone HL	Southern Zone HL		Southern Zone GN
Current 2019-2020+	2,740,000	1,096,000	493,200	575,400	2,164,600	575,400
2021/2022	2,998,400	1,199,360	539,712	629,664	2,368,736	629,664
2022/2023	3,110,400	1,244,160	559,872	653,184	2,457,216	653,184
2023/2024+	3,196,800	1,278,720	575,424	671,328	2,525,472	671,328

Council Conclusions:

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 Description of the Physical Environment

The physical environment for CMP species is provided in the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004), Generic Amendment 3 (GMFMC 2005), Amendment 18 to the CMP FMP (GMFMC and SAFMC 2011), Amendment 20B (GMFMC and SAFMC 2014), and Amendment 26 to the CMP FMP (GMFMC and SAFMC 2016) which are hereby incorporated by reference, and are summarized below.

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). Mean annual sea surface temperatures ranged from 54º F to 84º F (12º C to 29º C) including bays and bayous (Figure 3.1.1) between 1982 and 2009, according to satellite-derived measurements.[3] In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

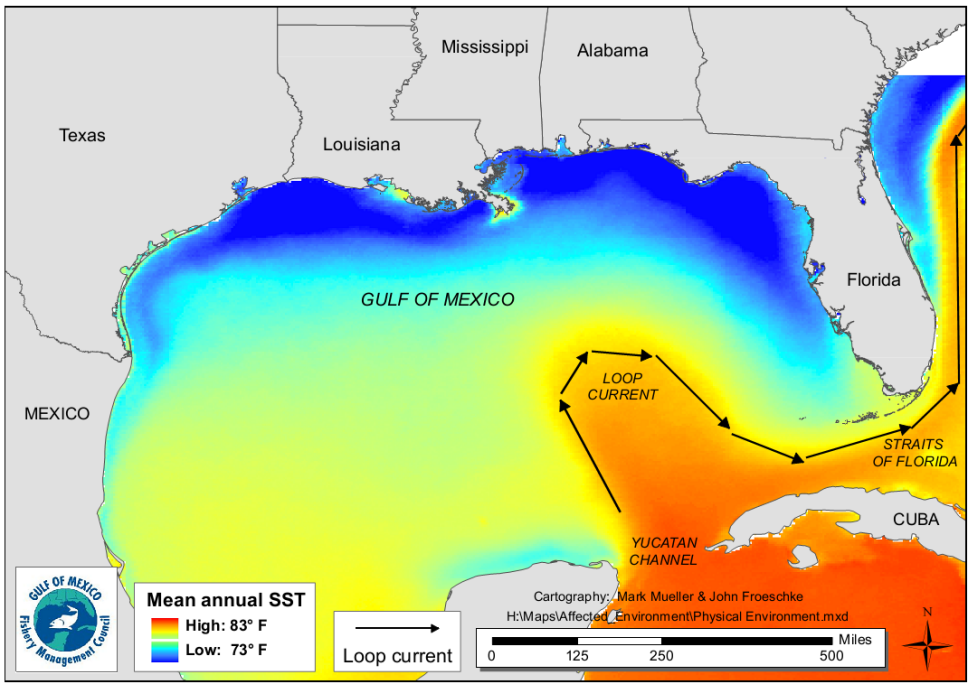

Figure 3.1. Mean annual sea surface temperature derived from the Advanced Very High-Resolution Radiometer Pathfinder Version 5 sea surface temperature data set.[4]

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

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

Habitat Areas of Particular Concern

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

Northern Gulf of Mexico Hypoxic Zone

Every summer in the northern Gulf, a large hypoxic zone forms. It is the result of allochthonous materials and runoff from agricultural lands resulting in increasing nutrient inputs to multiple rivers. These tributaries feed in to the Mississippi River, which disperses to the Gulf, and creates a temperature and salinity dependent layering of waters. The nutrient rich fresh waters from the Mississippi create seasonal, large algal blooms at the surface that eventually die, sink to the bottom, and decompose. This creates the oxygen-poor, hypoxic, bottom water layer unless front or storm events occur, which allows for mixing of the layers (Rabalais and Turner 2019). Mapping of the hypoxic zone began in 1985. For 2021, the extent of the hypoxic area was 6,334 square miles, almost triple what it was in 2020 (2,116 square miles), but still less than the extent of the 2017 hypoxic area (8,776 square miles). The changes in hypoxic area can be attributed to changing amounts of river discharge and its associated nutrient load and storm events. The major factor for the reduced size in 2020 was the active storm season with Hurricane Hanna passing right over the zone, allowing for mixing of the waters. The 2021 hypoxia area was higher than the 5-year hypoxic area average (5,408 square miles) and much larger than the 1,930 square mile goal set by the Interagency Mississippi River and Gulf of Mexico Hypoxia Task Force to be reached by 2035.[5] The hypoxic conditions in the northern Gulf directly impact less mobile benthic macroinvertebrates (e.g., polychaetes) by influencing density, species richness, and community composition (Baustian and Rabalais 2009; Breitburg et al. 2018). However, more mobile macroinvertebrates and demersal fishes, such as king mackerel, are able to detect lower dissolved oxygen levels and move away from hypoxic conditions. Therefore, these organisms are indirectly affected by limited prey availability and constrained available habitat (Baustian and Rabalais 2009; Craig 2012).

Greenhouse gases

The Intergovernmental Panel on Climate Change (IPCC) has indicated greenhouse gas emissions are one of the most important drivers of recent changes in climate. Wilson et al. (2017) inventoried the sources of greenhouse gases in the Gulf from sources associated with oil platforms and those associated with other activities such as fishing. A summary of the results of the inventory are shown in Table 3.1.1 with respect to total emissions and fishing. Commercial fishing and recreational vessels make up a small percentage of the total estimated greenhouse gas

[5] http://gulfhypoxia.net

emissions from the Gulf (2.04% and 1.67%, respectively).

Table 3.1.1. Total Gulf greenhouse gas 2014 emissions estimates (in tons per year) from oil platform and non-oil platform sources, commercial fishing, and percent greenhouse gas emissions from commercial fishing vessels of the total emissions*.

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

*Compiled from Tables 6–11, 6–12, and 6–13 in Wilson et al. (2017). **The CO_2 equivalent (CO_{2e}) emission estimates represent the number of tons of CO_2 emissions with the same global warming potential as one ton of another greenhouse gas (e.g., CH_4 and N_2O). Conversion factors to CO_{2e} are 21 for CH_4 and 310 for N_2O.

3.2 Description of the Biological/Ecological Environment

A description of the biological and ecological environment can be found in Amendment 18 to the CMP FMP (GMFMC and SAFMC 2011), Amendment 20B (GMFMC and SAFMC 2014), and Amendment 26 to the CMP FMP (GMFMC and SAFMC 2016). Those descriptions are summarized in the following sections and incorporated herein by reference.

3.2.1 Gulf King Mackerel Life History and Biology

King mackerel is a marine pelagic species that is found throughout the western Atlantic from the Gulf of Maine to Brazil, including the Gulf and Caribbean Sea, and from the shore to 656 ft (200 m) depths (Collete and Nauen 1983). The habitat of adults is the coastal waters out to the edge of the continental shelf. Within the area, the occurrence of king mackerel is governed by temperature and salinity (Fable et al. 1981, Powers and Eldridge 1983, Trent et al. 1987, Sutter et al. 1991, Schaefer and Fable 1994; Arreguin-Sanchez et al. 1995). They are seldom found in water temperatures less than 68ºF (20°C). Salinity preference varies, but they generally prefer high salinity, less than 36 parts per thousand (ppt) (McEachran et al. 1980).

Adults are migratory and the CMP FMP recognizes two migratory groups, Gulf and Atlantic (Powers and Eldridge 1983, Sutter et al. 1991, GMFMC and SAFMC 2016; Gold et al. 1997, Gold et al. 2002). Typically, adult king mackerel are found in the southern climates (south Florida and extreme south Texas/Mexico) in the winter and farther north in the summer.

However, some king mackerel overwinter in deeper waters off the mouth of the Mississippi River. Food availability and water temperature are likely causes of these migratory patterns. Gulf group king mackerel range from Texas to Florida, including Monroe County north of the Florida Keys, during all months of the year (SEDAR 38 Update 2020).

King mackerel are primarily piscivorous feeding mostly on schooling bait fish, but are also known to feed on cephalopods, shrimp, and crustaceans. (Saloman and Naughton 1983, Godcharles and Murphy 1986, Finucane et al. 1990). King mackerel have significant differences in growth and size at age between males and females (Shepard et al. 2010). King mackerel can weigh up to a record 97.8 lbs ww (44.4 kilograms [kg] ww), but are more common at weights of up to 50 lbs ww (23 kg ww). They reach average lengths of 26-32 inches fork length (FL) (700-800 millimeters [mm] FL) with a maximum of approximately double that. Maximum ages observed for king mackerel in the Gulf were 23 years for males and 24 years for females (Palmer et al. 2013).

Adults are known to spawn in areas of low turbidity, with salinity and temperatures of approximately 30 ppt and 80.6ºF (27°C), respectively. In the Gulf, there are major spawning areas off Louisiana and Texas (McEachran et al. 1980). Spawning occurs generally from May through October with peak spawning in September (Beaumariage 1973, Dwinell and Futch 1973, McEachran et al. 1980; Finucane et al. 1986, MacGregor et al. 1981). Eggs are believed to be released and fertilized continuously during these months. Females may mature first when they are 17.7 to 19.6 in (450 to 499 mm) in length and most are mature by the time they are 35.4 in (800 mm) in length, or by about age 4 (Finucane et al. 1986). Males are usually sexually mature at age 3, at a length of 28.3 in (718 mm) (Beaumariage 1973, Johnson et al. 1983). Larvae have a short developmental stage, which decreases its vulnerability and is related to the increased metabolism of this fast-swimming species. Juveniles are generally found closer to shore than adults and occasionally in estuaries.

Bycatch

Details of previous bycatch estimates in the king mackerel portion of the CMP fishery can be found in Appendix F (Bycatch Practicability Analysis) of Amendment 26 to the CMP FMP (GMFMC 2016), and is hereby incorporated by reference and summarized below.

Most king mackerel are harvested using hook-and-line gear. Discards in the commercial sector are relatively low (<1%) for king mackerel, including the gillnet component, while discards in the recreational charter (19%), and headboat (7%) are higher, with recreational private discards (41%) being much higher. Due to how the fishery is prosecuted for this species, little bycatch of other finfish species occurs.

Since SEDAR 16 (2008), the SEDAR data workshop panel has recommended a Gulf king mackerel discard mortality rate of 25% for the commercial sector utilizing hook-and-line gear, 100% for commercial gillnet, 22% for the recreational headboat fishery, and 20% for the recreational private and charter. Commercial discard mortality recommended for shrimp trawl use is 100%. There is no evidence that the Gulf king mackerel fishery is adversely affecting seabirds or marine mammals.

3.2.2 General Information

Protected Species

NMFS manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). A summary of these two laws and more information is available on NMFS Office of Protected Resources website.[6] ESA-listed species or Distinct Population Segments (DPS) of marine mammals, sea turtles, fish, and corals occur in the EEZ of the Gulf and South Atlantic. There are numerous stocks of marine mammals managed within the Southeast region. All marine mammals in U.S. waters are protected under the MMPA.

Six of the marine mammals (sperm, sei, fin, blue, North Atlantic right whale, and Rice's[7]) protected under the MMPA are also listed as endangered under the ESA and may occur in the Gulf. Rice's whales are the only resident baleen whales in the Gulf. Manatees, listed as threatened under the ESA, also occur in the Gulf and South Atlantic and are the only marine mammal species in this area managed by the U.S. Fish and Wildlife Service.

Sea turtles, fish, and corals that are listed as threatened or endangered under the ESA and occur in the Gulf include the following: five species/DPS of sea turtles (Kemp's ridley, Northwest Atlantic DPS of loggerhead, North Atlantic DPS of green, leatherback, and hawksbill); five species/DPS of fish (Gulf sturgeon, U.S. DPS of smalltooth sawfish, Nassau grouper, oceanic whitetip shark, and giant manta ray); and seven species of coral (elkhorn, staghorn, lobed star, mountainous star, boulder star, pillar, and rough cactus).

Additionally, critical habitat designated under the ESA for the Northwest Atlantic Ocean DPS of loggerhead sea turtle, sawfish, and Gulf sturgeon occurs in the Gulf, though only loggerhead critical habitat occurs in federal waters.

NMFS completed a biological opinion on June 18, 2015, evaluating the impacts of the CMP fishery on ESA-listed species. In the biological opinion (NMFS 2015), NMFS determined that the operation of the CMP fishery is not likely to adversely affect ESA-listed whales, corals, and have no effect on Gulf sturgeon. NMFS also determined that the CMP fishery is not likely to adversely affect designated critical habitat for elkhorn and staghorn coral or the Northwest Atlantic DPS of loggerhead sea turtle. The 2015 biological opinion concluded that the CMP fishery's continued authorization is likely to adversely affect, but is not likely to jeopardize, green, hawksbill, Kemp's ridley, leatherback, or the Northwest Atlantic DPS of loggerhead sea turtles, as well as smalltooth sawfish. An incidental take statement for sea turtles and smalltooth sawfish was issued. Reasonable and prudent measures to minimize the impact of these incidental takes were specified, along with terms and conditions to implement them.

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

[7] Rice's whale was known at the time of listing as the Gulf Bryde's whale, but was later identified as morphologically and genetically distinct from other whales under the Bryde's whale complex. Therefore, NMFS revised the Enumeration of endangered marine and anadromous species accordingly (86 FR 47022, Aug. 23, 2021).

On April 6, 2016, NMFS and the U.S. Fish and Wildlife Service published a final rule (81 FR 20057), effective May 6, 2016, listing 11 DPSs of green sea turtle. The final rule, which superseded the previous green sea turtle listing, listed eight DPSs as threatened and three DPSs as endangered. On June 29, 2016, NMFS published a final rule (81 FR 42268) to list Nassau grouper as threatened under the ESA, effective July 29, 2016. Because the range of both the North Atlantic and South Atlantic DPSs of green sea turtle and the Nassau grouper occur within the action area of the CMP fishery, NMFS reinitiated consultation on the CMP fishery in March 2017. NMFS completed an Amendment to the 2015 biological opinion on November 18, 2017. The amended biological opinion (NMFS 2017) concluded that the CMP fishery's continued authorization is not likely to adversely affect Nassau grouper and is likely to adversely affect, but is not likely to jeopardize, the North Atlantic and South Atlantic DPSs of green sea turtle. A revised incidental take statement was issued.

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 fishing under the CMP FMP during the reinitiation 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 15, 2019, NMFS published a final rule listing the Gulf Bryde's whale (now Rice's whale) as endangered under the ESA.[8] In a memorandum dated July 8, 2019, NMFS determined that the very limited overlap between the CMP fishery and Gulf Bryde's whale habitat and the utilization of a gear types unlikely to pose an entanglement risk, the risk of adverse effects on the Gulf Bryde's whale from interactions with fishing under the CMP FMP were discountable. In that same July 8, 2019, memorandum, NMFS concluded that the activities associated with the CMP FMP were not likely to adversely affect the continued existence of the Gulf Bryde's whale during the revised reinitiation period.

There is no information to indicate marine mammals and birds rely on Gulf king mackerel for food, and they are not generally caught by fishermen harvesting king mackerel. The primary gear in the Gulf CMP fishery used to harvest king mackerel is hook-and-line. This gear is classified in the 2022 Marine Mammal Protection Act List of Fisheries as a Category III fishery (87 FR 23122), meaning the annual mortality and serious injury of a marine mammal resulting from the fishery is less than or equal to 1% of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The Gulf CMP gillnet component of the CMP fishery is classified as Category II fishery. 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 gillnet portion of the CMP fishery has no documented interaction with marine mammals; NMFS classifies gillnet portion of the CMP

[8] The changes to the taxonomic classification of this species and its common name have no effect on NMFS's conclusion that the activities associated with the CMP FMP will not jeopardize the continued existence of the species during the revised reinitiation period.

fishery as Category II based on analogy (similar risk to marine mammals) with other gillnet fisheries. Additionally, there is no evidence that the Gulf king mackerel fishery as a whole is adversely affecting seabirds.

Deepwater Horizon MC252 Oil Spill

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

In addition to the crude oil, over a million gallons of the dispersant, Corexit 9500A®, was applied to the ocean surface and an additional hundreds of thousands of gallons of dispersant was pumped to the mile-deep wellhead (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted until the *Deepwater Horizon* MC252 oil spill. Thus, no data exist on the environmental fate of dispersants in deep water. Twenty-first century dispersant applications are thought to be less harmful than their predecessors. However, the combination of oil and dispersants has proven to be more toxic to marine fishes than either dispersants or crude oil alone. Marine fish which are more active (e.g. a pelagic species versus a demersal species) appear to be more susceptible to negative effects from interactions with weathered oil/dispersant emulsions. These effects can include mobility impairment and inhibited respiration (Swedmark et al. 1973). The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern. More information about the *Deepwater Horizon* MC252 oil spill is available on the NOAA Southeast Regional Office website.[9]

Climate change

Climate change projections predict increases in sea-surface temperature and sea level; decreases in sea-ice cover; and changes in salinity, wave climate, and ocean circulation (IPCC).[10] These changes are likely to affect plankton biomass and fish larvae abundance that could adversely impact fish, marine mammals, seabirds, and ocean biodiversity. Kennedy et al. (2002) and Osgood (2008) have suggested global climate change could affect temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; change precipitation patterns and cause a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influence the productivity of critical coastal

[9] https://www.fisheries.noaa.gov/news/deepwater-horizon-10-years-later-10-questions
[10] http://www.ipcc.ch/

ecosystems such as wetlands, estuaries, and coral reefs. The National Oceanic and Atmospheric Association (NOAA) Climate Change Web Portal[11] predicts the average sea surface temperature in the Gulf and South Atlantic will increase by 2-4ºF (1–3ºC) for 2010–2070 compared to the average over the years 1950–2010. For reef fishes and snapper-grouper species, Burton (2008) and Morley et al. (2018) speculated climate change could cause shifts in spawning seasons, changes in migration patterns, and changes to basic life history parameters such as growth rates.

The distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms (Sokolow 2009; Hollowed et al. 2013; Maynard et al. 2015; Wells et al. 2015; Gobler 2020). Some stocks have already shown increases in abundance in the northern Gulf (Fodrie et al. 2010) and Texas estuaries (Tolan and Fisher 2009). Integrating the potential effects of climate change into the fisheries assessment process is currently difficult due to the assessment rarely projecting through a time span that would include detectable climate change effects (Hollowed et al. 2013). However, there are ecosystem models available or being developed that incorporate future, potential, climate change effects (King and McFarlane 2006; Pinsky and Mantua 2014; Gruss et al. 2017; Chagaris et al. 2019). While complex, these factors do not change the reality of climate change impacts on managed species and the need to incorporate this information into stock assessments. Better planning and collaboration with managers are currently being pursued to include this type of data into the assessment process.

The Southeast Fisheries Science Center (SEFSC) has developed climate vulnerability analyses (CVA)[12] that can be used to determine the vulnerability of Gulf king mackerel to climate changes stressors. According to the SEFSC CVA, and as is the case for many species in the Gulf, king mackerel have very high climate exposures to sea surface temperatures, ocean acidification, dissolved oxygen, and salinity. However, Gulf king mackerel's biological processes (Table 3.2.2.1) were projected to have low sensitivity. While king mackerel have certain life history requirements (biological traits were generally ranked moderate to low), they can also move around reasonably well to find sufficient conditions, and so they have a moderate overall climate vulnerability. Generally, the Gulf is projected by the SEFSC models used to become warmer, saltier, less oxygenated, and more acidic everywhere during the current fifty years. Conditions will have similar, but amplified, patterns in the 2056–2099 period (Quinlan et al. in press).

Table 3.2.2.1. Gulf king mackerel biological processes analyzed for climate change sensitivities.

	Scomberomorus cavalla
Sensitivity Attributes	Habitat Specificity
	Prey Specificity
	Adult Mobility
	Dispersal of Early Life Stages
	Early Life History Survival and Settlement Requirements
	Complexity in Reproductive Strategy

[11] https://www.esrl.noaa.gov/psd/ipcc/
[12] https://www.fisheries.noaa.gov/national/climate/climate-vulnerability-assessments

Scomberomorus cavalla	
	Spawning Cycle
	Sensitivity to Temperature
	Sensitivity to Ocean Acidification
	Population Growth Rate
	Stock Size/Status
	Other Stressors

3.3 Description of the Economic Environment

Economic information pertaining to the Coastal Migratory Pelagic (CMP) fishery and Gulf migratory group king mackerel (Gulf king mackerel), in particular, can be found in Vondruska (2010), Framework Amendment 5 (GMFMC and SAFMC 2017), and Amendment 26 (GMFMC and SAFMC 2016), and is incorporated herein by reference. The following section contains select updated information on the economic environment of the Gulf king mackerel portion of the CMP fishery, broken down by sector. Inflation adjusted revenues and prices are reported in 2021 dollars using the annual, non-seasonally adjusted Gross Domestic Product (GDP) implicit price deflator provided by the U.S. Bureau of Economic Analysis (BEA).

3.3.1 Commercial Sector

Permits

Any fishing vessel that harvests king mackerel from Atlantic and Gulf Federal waters must have a valid limited access commercial king mackerel permit. A separate and additional valid limited access commercial king mackerel gillnet endorsement is required to harvest the species using a run-around gillnet in the Gulf migratory group Southern zone. During 2020, there were a total of 1,426 valid or renewable[13] king mackerel permits and 17 valid or renewable king mackerel gillnet endorsements.

Commercial harvest of CMP species in the Exclusive Economic Zone (EEZ) may only be sold to dealers with a federal dealer permit. As of December 21, 2021, there were 341 entities with a federal Gulf and South Atlantic Dealers (GSAD) permit.

Vessels, Trips, Landings, and Dockside Revenue

The following summaries of landings, revenue, and effort (Table 3.3.1.1, Table 3.3.1.2, Table 3.3.1.3, and Table 3.3.1.4) are based on logbook information and the National Marine Fisheries Service (NMFS) Accumulated Landings System (ALS) for prices. Therefore, the values contained in this section may not match exactly with landings and revenue values presented elsewhere in this document that used ACL monitoring data. In addition, the landings are presented in gutted weight (gw) rather than in landed weight (lw). Landings for all species in the

[13] A renewable permit is an expired limited access permit that cannot be actively fished, but can be renewed for up to one year after expiration.

SEFSC Social Science Research Group's (SEFSC-SSRG) Socioeconomic Panel data are expressed in gw to provide one unit for all species. This is because data summarizations, as presented in Table 3.3.1.1, Table 3.3.1.2, Table 3.3.1.3, and Table 3.3.1.4 below, generally involve a multitude of species. It is also important to note that federally-permitted vessels that are required to submit logbooks generally report their harvest of most species regardless of whether the fish were caught in state or federal waters.

The number of federally permitted commercial vessels that harvested Gulf king mackerel in the Gulf declined by approximately 15% from 2016 through 2020, with a peak in participation in 2017 (Table 3.3.1.1). Ex-vessel revenue from Gulf king mackerel increased for these vessels from 2016 through 2018, but then decreased through 2020 (Tables 3.3.1.2). The average annual price per lb gw for king mackerel harvested from the Gulf during this period was $2.25 (2021 dollars). On average (2016 through 2020), vessels that landed king mackerel did so on approximately 59% of their Gulf trips and king mackerel comprised approximately a quarter of their annual revenue from all species (Tables 3.3.1.1 and 3.3.1.2). Average annual revenue per vessel for all species harvested by these vessels experienced a downward trend from 2016 through 2020, with an overall decrease of 44% (Table 3.4.1.2). Although not shown in the tables, on average from 2016 through 2020, gillnet landings accounted for approximately 21% of all Gulf king mackerel landings in Gulf jurisdictional waters. In addition, during this period there was no discernable difference in average price per lb gw between gillnet and hook and line landings except for in 2019.[14]

Liese and Overstreet (2021) provide annual estimates of net cash flow and net revenue from operations for vessels that harvested king mackerel in the Gulf and South Atlantic. Net cash flow is total annual revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, loan payments, and purchases of annual allocation. Net revenue from operations is total annual revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, and the opportunity cost of an owner's time as captain as well as the vessel's depreciation. Of these measures, net revenue from operations most closely represents economic profits to the owner(s). According to Liese and Overstreet (2021), annual net cash flow for commercial vessels that harvested king mackerel in the Gulf was 30.7% of their annual gross revenue, on average, from 2016 through 2018. Net revenue from operations was 21.6% of their average annual gross revenue during this period. Applying these percentages to the results provided in Table 3.3.1.2 would result in an estimated per vessel average annual net cash flow of $28,682 (2021 dollars) and an average annual net revenue from operations of $20,180 per year.

Table 3.3.1.1. Number of vessels, number of trips, and landings (lbs gw) by year for Gulf king mackerel in Gulf jurisdictional waters.

[14] Average price by gear type (gillnet versus hook and line) varied by no more than approximately $0.15 in all years except for 2019. In 2019, average price per lb gw was $1.36 for gillnet landings, which was $0.82 less than the average hook and line price of $2.18.

Year	# of vessels that caught king mackerel (> 0 lbs gw)	# of trips that caught king mackerel	king mackerel landings (lbs gw)	Other species' landings jointly caught w/ king mackerel (lbs gw)	# of Gulf trips that only caught other species	Other species' landings on Gulf trips w/o king mackerel (lbs gw)	All species landings on South Atlantic trips (lbs gw)*
2016	259	2,309	2,358,758	548,609	1,986	4,959,703	1,048,186
2017	299	2,890	2,705,663	777,912	1,842	4,367,997	1,074,506
2018	256	2,385	2,601,258	352,638	1,483	3,246,143	865,972
2019	237	2,180	2,431,084	423,101	1,774	3,601,284	781,979
2020	220	1,950	1,876,673	324,409	1,147	1,902,426	780,292
Average	254	2,343	2,394,687	485,334	1,646	3,615,511	910,187

Source: SEFSC-SSRG Socioeconomic Panel (January 2022 version).
Note: Calendar estimates are provided here for all statistics; however, because the king mackerel fishing year does not align with the calendar year, these will differ from king mackerel fishing year landings estimates. Additionally, landings from state waters by vessels without federal permits are not included.
*Refers to all species landings on South Atlantic trips taken by those vessels that harvested Gulf king mackerel in the Gulf each year.

Table 3.3.1.2. Number of vessels and ex-vessel revenue by year (2021 dollars)* for Gulf king mackerel in Gulf jurisdictional waters.

Year	# of vessels that caught king mackerel (> 0 lbs gw)	Dockside revenue from king mackerel	Dockside revenue from 'other species' jointly caught w/ king mackerel	Dockside revenue from 'other species' caught on Gulf trips w/o king mackerel	Dockside revenue from 'all species' caught on South Atlantic trips	Total dockside revenue	Average total dockside revenue per vessel
2016	259	$5,554,359	$2,083,366	$20,074,858	$2,592,609	$30,305,192	$117,008
2017	299	$6,112,945	$3,003,987	$17,868,903	$2,759,482	$29,745,317	$99,483
2018	256	$6,385,299	$1,424,872	$12,752,663	$2,190,928	$22,753,762	$88,882
2019	237	$4,971,463	$1,789,747	$14,146,978	$1,797,470	$22,705,658	$95,804
2020	220	$3,980,336	$1,218,252	$7,504,494	$1,806,301	$14,509,384	$65,952
Average	254	$5,400,880	$1,904,045	$14,469,579	$2,229,358	$24,003,862	$93,426

Source: SEFSC-SSRG Socioeconomic Panel (January 2022 version).
Note: Calendar estimates are provided here for all statistics; however, because the king mackerel fishing year does not align with the calendar year, these will differ from king mackerel fishing year landings estimates. Additionally, landings from state waters by vessels without federal permits are not included.

The Gulf king mackerel Southern Zone spans all of Monroe County, and therefore, comprises areas in both the South Atlantic and Gulf jurisdictional waters. Because the SEFSC-SSRG Socioeconomic Panel data are broken down by sub-region and operating characteristics among South Atlantic and Gulf vessels are not the same, Table 3.3.1.3 and Table 3.3.1.4 present results for South Atlantic vessels that harvested Gulf king mackerel in South Atlantic waters (i.e., king mackerel in Monroe County). King mackerel landed elsewhere in the South Atlantic are Atlantic king mackerel. The number of federally permitted commercial vessels that harvested Gulf king mackerel in the South Atlantic fluctuated from 2016 through 2020, with a peak in participation in 2017 (Table 3.3.1.3). Ex-vessel revenue from Gulf king mackerel increased for these vessels from 2016 through 2019, but then decreased sharply in 2020 (Tables 3.3.1.4). This decrease may be due in part to disruptions to the CMP fishery caused by COVID-19. The average annual price per lb gw for Gulf king mackerel harvested in the South Atlantic from 2016 through 2020 was $2.31 (2021 dollars). On average (2016 through 2020), South Atlantic vessels that landed Gulf king mackerel did so on approximately 34% of their South Atlantic trips and Gulf king mackerel comprised approximately 14% of their annual revenue from all species (Tables 3.3.1.3 and 3.3.1.4). Average annual revenue per vessel for all species harvested by these vessels increased from 2016 through 2017, but then steadily decreased through 2020 (Table 3.3.1.4). Although not shown in the tables, on average from 2016 through 2020, gillnet landings accounted for approximately 3% of all Gulf king mackerel landings in South Atlantic jurisdictional waters. In addition, during this period there was no discernable difference in average price per lb gw between Gulf king mackerel gillnet and hook and line landings in the South Atlantic.[15]

According to Liese and Overstreet (2021), annual net cash flow for commercial vessels that harvested king mackerel in the South Atlantic was 23.7% of their annual gross revenue, on average, from 2016 through 2018. Net revenue from operations was 4.5% of their average annual gross revenue during this period. Applying these percentages to the results provided in Table 3.3.1.4 would result in an estimated per vessel average annual net cash flow of $9,488 (2021 dollars) and an average annual net revenue from operations of $1,802 per year.

Table 3.3.1.3. Number of vessels, number of trips, and landings (lbs gw) by year for Gulf king mackerel in South Atlantic jurisdictional waters.

Year	# of vessels that caught Gulf king mackerel (> 0 lbs gw)	# of trips that caught Gulf king mackerel	Gulf king mackerel landings (lbs gw)	Other species' landings jointly caught w/ Gulf king mackerel (lbs gw)	# of South Atlantic trips that only caught other species	Other species' landings on South Atlantic trips w/o Gulf king mackerel (lbs gw)	All species landings on Gulf trips (lbs gw)*
2016	133	1,459	235,847	133,433	3,556	1,359,562	322,966
2017	137	1,715	304,316	162,546	3,596	1,546,441	403,480
2018	120	1,589	288,179	125,519	3,198	1,124,979	315,455

[15] Average price by gear type (gillnet versus hook and line) varied by no more than plus or minus $0.23 from 2016 through 2020.

Year	# of vessels that caught Gulf king mackerel (> 0 lbs gw)	# of trips that caught Gulf king mackerel	Gulf king mackerel landings (lbs gw)	Other species' landings jointly caught w/ Gulf king mackerel (lbs gw)	# of South Atlantic trips that only caught other species	Other species' landings on South Atlantic trips w/o Gulf king mackerel (lbs gw)	All species landings on Gulf trips (lbs gw)*
2019	133	1,910	370,046	121,653	3,077	1,033,184	255,644
2020	118	1,484	285,873	84,570	2,247	722,766	203,454
Average	128	1,631	296,852	125,544	3,135	1,157,386	300,200

Source: SEFSC-SSRG Socioeconomic Panel (January 2022 version).
Note: Calendar estimates are provided here for all statistics; however, because the king mackerel fishing year does not align with the calendar year, these will differ from king mackerel fishing year landings estimates. Additionally, landings from state waters by vessels without federal permits are not included.
*Refers to all species landings on Gulf trips taken by those vessels that harvested Gulf king mackerel in the South Atlantic each year.

Table 3.3.1.4. Number of vessels and ex-vessel revenue by year (2021 dollars)* for Gulf king mackerel in South Atlantic jurisdictional waters.

Year	# of vessels that caught Gulf king mackerel (> 0 lbs gw)	Dockside revenue from Gulf king mackerel	Dockside revenue from 'other species' jointly caught w/ Gulf king mackerel	Dockside revenue from 'other species' caught on South Atlantic trips w/o Gulf king mackerel	Dockside revenue from 'all species' caught on Gulf trips	Total dockside revenue	Average total dockside revenue per vessel
2016	133	$572,098	$382,642	$4,192,459	$990,406	$6,137,606	$46,147
2017	137	$690,051	$444,121	$4,491,488	$1,107,257	$6,732,918	$49,145
2018	120	$713,758	$297,928	$3,302,944	$801,325	$5,115,954	$42,633
2019	133	$825,776	$269,881	$2,955,855	$671,551	$4,723,063	$35,512
2020	118	$617,526	$200,599	$1,864,884	$472,095	$3,155,104	$26,738
Average	128	$683,842	$319,034	$3,361,526	$808,527	$5,172,929	$40,035

Source: SEFSC-SSRG Socioeconomic Panel (January 2022 version).
Note: Calendar estimates are provided here for all statistics; however, because the king mackerel fishing year does not align with the calendar year, these will differ from king mackerel fishing year landings estimates. Additionally, landings from state waters by vessels without federal permits are not included.

Imports

Imports of seafood products compete in the domestic seafood market and have in fact dominated many segments of the seafood market. Imports affect the price for domestic seafood products and tend to set the price in the market segments in which they dominate. Seafood imports have

downstream effects on the local fish market. At the harvest level for mackerel species, imports affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to the domestic production of mackerel species, imports tend to cushion the adverse economic effects on consumers resulting from a reduction in domestic landings. The following describes the imports of fish products that directly compete with the domestic harvest of mackerel species. Imports data for king mackerel, in particular, are not available.

Ninety-six and a half percent of mackerel imports[16], on average (2016 through 2020), were comprised of frozen or prepared/preserved fish[17]; the remaining 3.5% were fresh. Imports of mackerel increased steadily from 58.9 million lbs product weight (pw) in 2016 to 69.1 million lbs pw in 2020. During the period, total revenue from mackerel imports ranged from approximately $75.6 million (2021 dollars) to $93.3 million. Imports of mackerel primarily originated in China, Norway, and Thailand, and to a lesser extent, Vietnam, South Korea and Mexico. These imports primarily entered the U.S. through the ports of New York, Los Angeles, and Baltimore. Mackerel imports were highest on average (2016 through 2020) during the months of January, November, and December.

Business Activity

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

Estimates of the U.S. average annual business activity associated with the commercial harvest of Gulf king mackerel by Council jurisdiction were derived using the model developed for and applied in NMFS (2021) and are provided in Table 3.3.1.5 and Table 3.3.1.6.[18] This business activity is characterized as jobs (full- and part-time), output impacts (gross business sales), income impacts (wages, salaries, and self-employed income), and value-added impacts, which represent the contribution made to the U.S. GDP. These impacts should not be added together because this would result in double counting. It should be noted that the results provided should be interpreted with caution and demonstrate the limitations of these types of assessments. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species. Separate models to address individual species are not available. For example, the results provided here apply to a general "reef fish" category

[16] NOAA Fisheries Service purchases fisheries trade data from the Foreign Trade Division of the U.S. Census Bureau. Data are available for download at http://www.st.nmfs.noaa.gov/st1/trade/index.html.
[17] Includes dried, salted and smoked mackerel.
[18] A detailed description of the input/output model is provided in NMFS (2011).

rather than just king mackerel, and a harvester job is "generated" for approximately every $35,200 (2021 dollars) in ex-vessel revenue. These results contrast with the number of harvesters (vessels) with recorded landings of king mackerel presented in Table 3.4.1.1 and Table 3.4.1.3.

Table 3.3.1.5. Average annual business activity (2016 through 2020) associated with the commercial harvest of Gulf king mackerel in Gulf jurisdictional waters. All monetary estimates are in 2021 dollars.

Species	Average Ex-vessel Value ($ thousands)	Total Jobs	Harvester Jobs	Output (Sales) Impacts ($ thousands)	Income Impacts ($ thousands)	Value Added ($ thousands)
Gulf king mackerel	$5,401	646	153	$53,560	$19,669	$27,790

Source: Calculated by NMFS Southeast Regional Office (SERO) using the model developed for and applied in NMFS (2021).

Table 3.3.1.6. Average annual business activity (2016 through 2020) associated with the commercial harvest of Gulf king mackerel in South Atlantic jurisdictional water. All monetary estimates are in 2021 dollars.

Species	Average Ex-vessel Value ($ thousands)	Total Jobs	Harvester Jobs	Output (Sales) Impacts ($ thousands)	Income Impacts ($ thousands)	Value Added ($ thousands)
Gulf king mackerel	$684	82	19	$6,782	$2,490	$3,519

Source: Calculated by NMFS Southeast Regional Office (SERO) using the model developed for and applied in NMFS (2021).

3.3.2 Recreational Sector

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

Permits

For anglers to fish for or possess CMP species in or from the Gulf exclusive economic zone (EEZ) on for-hire vessels, those vessels are required to have a limited access Gulf Charter/Headboat for Coastal Migratory Pelagics permit (Gulf CMP for-hire permit). On February 1, 2022, there were 1,299 valid (non-expired) or renewable[19] Gulf CMP for-hire permits and 4 valid or renewable Gulf CMP historical captain for-hire permits. For anglers to fish for or possess CMP species in or from the Mid-Atlantic or South Atlantic EEZ on for-hire vessels, those vessels are required to have an open access South Atlantic Charter/Headboat for Coastal Migratory Pelagic permit (South Atlantic CMP for-hire permit). On September 3, 2021, there were 1,825 valid South Atlantic CMP for-hire permits. Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, only federally permitted headboats are required to submit harvest and effort information to the National Marine Fisheries Service (NMFS) Southeast Region Headboat Survey (SRHS).[20] Participation in the SRHS is based on determination by the Southeast Fisheries Science Center (SEFSC) that the vessel primarily operates as a headboat. As of February 22, 2022, 69 Gulf headboats and 66 South Atlantic headboats were registered in the SRHS (K. Brennan, NMFS SEFSC, pers. comm. 2022). As a result, of the 1,303 vessels with Gulf CMP for-hire permits (including historical captain permits), up to 69 may primarily operate as headboats and the remainder as charter vessels. Of the 1,825 vessels with South Atlantic CMP for-hire permits, up to 66 may primarily operate as headboats.

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

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

Landings

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

[20] All federal charter/headboat permit holders, including charter vessel owners or operators, are required to comply with the new Southeast For-Hire Electronic Reporting Program as of January 5, 2021. Under this program, vessels with Gulf permits must declare trips prior to departure and submit electronic fishing reports prior to offloading fish, or within 30 minutes after the end of a trip, if no fish are landed. Vessels with South Atlantic permits must submit logbooks weekly, by 11:59 pm, local time, the Tuesday following a reporting week (Monday-Sunday). Those vessels selected to report to the SRHS (i.e., federally permitted headboats) will continue to submit their reports under the new requirements directly to the SRHS program. For more information, see: https://www.fisheries.noaa.gov/southeast/recreational-fishing-data/southeast-hire-electronic-reporting-program?utm_medium=email&utm_source=govdelivery.

Recreational landings of Gulf king mackerel were fairly stable from the 2015/2016 fishing year through the 2018/2019 fishing year and then experienced a substantial decrease in 2019/2020 (Figure 3.3.2.1). This decrease may be due in part to disruptions to the CMP fishery caused by COVID-19. Private mode landings consistently accounted for over half of all recreational Gulf king mackerel landings each year during the 2015/2016 through 2019/2020 fishing years.

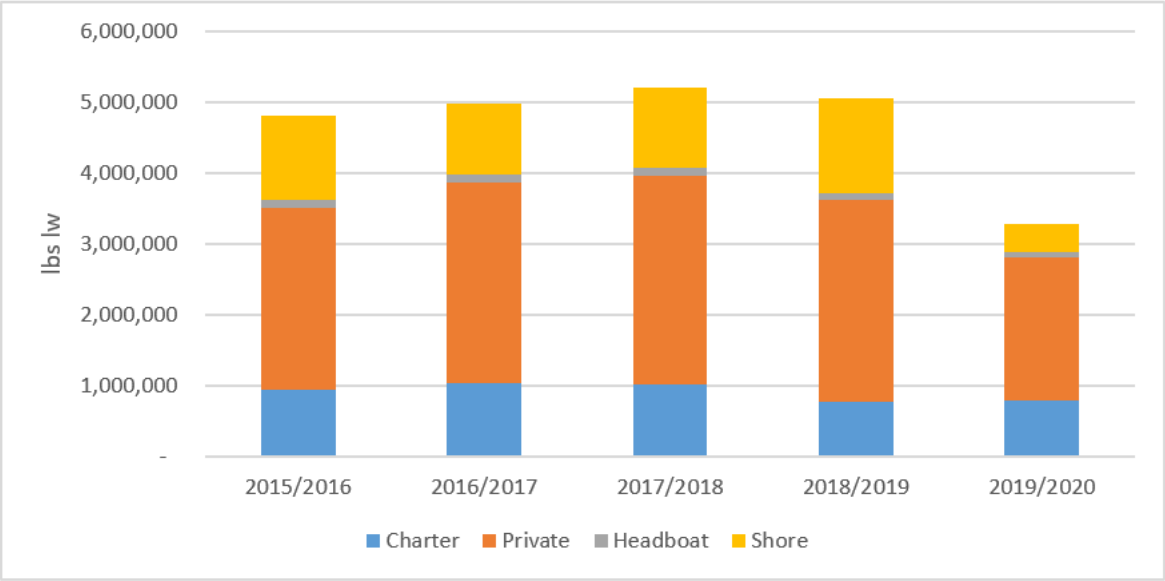

Figure 3.3.2.1. Recreational landings of Gulf king mackerel by mode and fishing year (2015/2016 – 2019/2020).
Source: SEFSC MRIP FES ACL data set (March 2022).
Note: The Gulf king mackerel fishing year runs from July 1 to June 30.

Angler Effort

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

- Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or the second primary target for the trip. The species did not have to be caught.
- Catch effort - The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.
- Total recreational trips - The total estimated number of recreational trips in the Gulf, regardless of target intent or catch success.

Given the subject nature of this action, the following discussion focuses on target and catch trips for Gulf king mackerel. Data from MRIP, the Louisiana Department of Wildlife and Fisheries (LDWF) Recreational Creel Survey, and the Texas Parks and Wildlife Department (TPWD) Marine Sport-Harvest Monitoring Program were used to estimate these trips. It is important to note that in 2018, MRIP transitioned from the old Coastal Household Telephone Survey (CHTS)

to a new mail-based fishing effort survey (FES). The MRIP-based estimates presented for FL, AL, and MS in Table 3.3.2.1 and Table 3.3.2.2 are calibrated to the FES and may be greater than estimates that are non-calibrated.[21] In addition, the estimates for Florida include all Southern Zone king mackerel target and catch trips, including those that occur in the South Atlantic portion of Monroe County, in accordance with the MRIP sampling frame. Finally, effort estimates for Louisiana from the LDWF Recreational Creel Survey are not calibrated to MRIP and are therefore not directly comparable to the MRIP-based estimates.

Both target and catch trips for Gulf king mackerel experienced downward trends (with fluctuation) throughout most Gulf states from 2016 through 2020 (Table 3.3.2.1 and Table 3.3.2.2). Florida and Alabama recorded the most target and catch trips for king mackerel during this period (Table 3.3.2.1 and Table 3.3.2.2). In Florida, there were approximately 2 times as many Gulf king mackerel target trips as catch trips, on average from 2016 through 2020, and in Alabama there were almost 3 times as many (Table 3.3.2.1 and Table 3.3.2.2). This was mainly driven by the shore mode and suggests there is a relatively strong interest in catching king mackerel among recreational anglers in those states.

Table 3.3.2.1. Gulf king mackerel recreational target trips, by mode, state, and calendar year.

	Alabama	Florida*	Louisiana**	Mississippi	Texas
	Shore Mode				
2016	494,464	582,235	N/A	0	N/A
2017	323,406	421,973	N/A	0	N/A
2018	434,077	807,194	N/A	0	N/A
2019	402,915	317,459	N/A	0	N/A
2020	72,994	763,682	N/A	0	N/A
Average	345,571	578,509	N/A	0	N/A
	Charter Mode				
2016	6,587	27,919	284	0	1,296
2017	4,833	44,190	0	22	948
2018	1,105	41,120	0	614	3,003
2019	2,756	35,538	0	0	1,895
2020	3,496	37,396	0	0	1,356
Average	3,755	37,233	57	127	1,699
	Private/Rental Mode				
2016	80,423	417,714	1,435	0	8,499
2017	46,150	448,027	2,170	2,078	6,957

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

	Alabama	Florida*	Louisiana**	Mississippi	Texas
2018	63,097	327,617	1,785	10,128	11,608
2019	51,224	353,664	269	0	8,813
2020	32,669	243,013	679	0	7,014
Average	54,713	358,007	1,268	2,441	8,578
	All Modes				
2016	581,474	1,027,868	1,719	0	9,795
2017	374,389	914,190	2,170	2,100	7,905
2018	498,280	1,175,931	1,785	10,741	14,611
2019	456,896	706,661	269	0	10,708
2020	109,160	1,044,091	679	0	8,370
Average	404,040	973,748	1,324	2,568	10,278

Source: MRIP database, SERO, NMFS (March 2022) for AL, FL and MS. LDWF Recreational Creel Survey for LA. TPWD Marine Sport-Harvest Monitoring Program for TX.
*Includes all trips that targeted Gulf king mackerel, including throughout Monroe County, FL.
**These data are not currently calibrated with the MRIP data and are therefore not directly comparable to the MRIP-based estimates. Additionally, the private and shore modes are combined in the LDWF Recreational Creel Survey and are presented here together under the Private/Rental Mode.
Note 1: The estimates for AL, FL, and MS are based on MRIP FES.
Note 2: Headboat information is unavailable.
Note 3: Texas shore mode data is not available.

Table 3.3.2.2. Gulf king mackerel recreational catch trips, by mode, state, and calendar year.

	Alabama	Florida*	Louisiana**	Mississippi	Texas
	Shore Mode				
2016	107,513	143,692	N/A	0	N/A
2017	28,432	70,048	N/A	0	N/A
2018	58,543	92,400	N/A	0	N/A
2019	43,612	34,389	N/A	0	N/A
2020	6,734	88,841	N/A	0	N/A
Average	48,967	85,874	N/A	0	N/A
	Charter Mode				
2016	30,097	128,733	1,380	4,874	3,480
2017	18,840	124,689	882	1,449	3,459
2018	14,504	120,595	390	1,639	7,061
2019	15,998	129,672	489	36	5,225
2020	17,975	133,905	327	52	3,927
Average	19,483	127,519	694	1,610	4,631
	Private/Rental Mode				
2016	83,052	313,896	5,220	990	9,659

	Alabama	Florida*	Louisiana**	Mississippi	Texas
2017	79,330	402,306	5,355	0	10,082
2018	79,927	194,872	3,757	14,892	13,772
2019	33,033	233,360	6,698	1,684	11,300
2020	78,079	153,993	2,053	233	6,592
Average	70,684	259,685	4,617	3,560	10,281
	All Modes				
2016	220,662	586,321	6,600	5,864	13,139
2017	126,602	597,043	6,237	1,449	13,541
2018	152,974	407,866	4,147	16,531	20,832
2019	92,643	397,420	7,187	1,720	16,526
2020	102,788	376,738	2,380	285	10,519
Average	139,134	473,078	5,310	5,170	14,912

Source: MRIP database, SERO, NMFS (March 2022) for AL, FL and MS. LDWF Recreational Creel Survey for LA. TPWD Marine Sport-Harvest Monitoring Program for TX.
*Includes all trips that caught Gulf king mackerel, including throughout Monroe County, FL.
**These data are not currently calibrated with the MRIP data and are therefore not directly comparable to the MRIP-based estimates. Additionally, the private and shore modes are combined in the LDWF Recreational Creel Survey and are presented here together under the Private/Rental Mode.
Note 1: The estimates for AL, FL, and MS are based on MRIP FES.
Note 2: Headboat information is unavailable.
Note 3: Texas shore mode data is not available.

Similar analysis of recreational effort is not possible for the headboat mode because headboat data are not collected at the angler level. Estimates of effort by the headboat mode are provided in terms of angler days, or the total number of standardized full-day angler trips.[22] Headboat angler days were fairly stable across the Gulf states from 2016 through 2019 (Table 3.3.2.3). There was, however, a downward trend in reported angler days in Florida from 2016 on and a substantial dip in all states in 2020, likely due to the impacts of COVID-19 closures and disruptions. On average (2016 through 2020), Florida accounted for the majority of headboat angler days reported, followed by Texas and Alabama; whereas, Mississippi and Louisiana combined accounted for only a small percentage (Table 3.3.2.3). Headboat effort in terms of angler days for the entire Gulf tended to be concentrated most heavily during the summer months of June through August (Table 3.3.2.4).

Table 3.3.2.3. Gulf headboat angler days and percent distribution by state (2016 - 2020).

	Angler Days				Percent Distribution			
	FL	AL	MS-LA*	TX	FL	AL	MS-LA	TX
2016	183,147	16,831	2,955	54,083	71.3%	6.5%	1.1%	21.0%

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

	Angler Days				Percent Distribution			
	FL	AL	MS-LA*	TX	FL	AL	MS-LA	TX
2017	178,816	17,841	3,189	51,575	71.1%	7.1%	1.3%	20.5%
2018	171,996	19,851	3,235	52,160	69.6%	8.0%	1.3%	21.1%
2019	161,564	18,607	2,632	52,456	68.7%	7.9%	1.1%	22.3%
2020	126,794	13,091	1,728	51,498	65.7%	6.8%	0.9%	26.7%
Average	164,463	17,244	2,748	52,354	69.3%	7.3%	1.1%	22.3%

Source: NMFS SRHS (February, 2020).
*Headboat data from Mississippi and Louisiana are combined for confidentiality purposes.
Note: 2020 estimates reflect closures and disruptions to service as a result of COVID-19.

Table 3.3.2.4. Gulf headboat angler days (in thousands) and percent distribution by month (2016 - 2020).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Headboat Angler Days (in thousands)											
2016	8.0	13.2	21.8	18.7	21.7	50.3	49.9	21.8	13.6	15.8	11.8	10.4
2017	9.0	14.0	21.0	19.4	19.2	47.7	54.0	23.0	10.3	11.1	11.3	11.5
2018	5.5	13.7	20.8	17.6	16.9	54.3	53.3	24.8	13.2	10.6	8.2	8.4
2019	2.3	12.8	21.8	16.3	18.3	46.0	47.6	24.2	11.4	13.7	10.4	10.4
2020	8.1	10.9	11.4	0.4	11.1	43.9	42.0	20.6	12.2	14.5	8.7	9.1
Avg	6.6	12.9	19.4	14.5	17.4	48.4	49.4	22.9	12.1	13.1	10.1	10.0
	Percent Distribution											
2016	3.1%	5.1%	8.5%	7.3%	8.4%	19.6%	19.4%	8.5%	5.3%	6.2%	4.6%	4.0%
2017	3.6%	5.6%	8.4%	7.7%	7.6%	19.0%	21.5%	9.1%	4.1%	4.4%	4.5%	4.6%
2018	2.2%	5.5%	8.4%	7.1%	6.8%	21.9%	21.6%	10.0%	5.4%	4.3%	3.3%	3.4%
2019	1.0%	5.4%	9.3%	6.9%	7.8%	19.6%	20.2%	10.3%	4.8%	5.8%	4.4%	4.4%
2020	4.2%	5.6%	5.9%	0.2%	5.8%	22.7%	21.8%	10.7%	6.3%	7.5%	4.5%	4.7%
Avg	2.8%	5.5%	8.1%	5.8%	7.3%	20.6%	20.9%	9.7%	5.2%	5.6%	4.3%	4.2%

Source: NMFS SRHS (March 2022).
Note: 2020 estimates reflect closures and disruptions to service as a result of COVID-19.

From 2016 through 2019, headboat effort in the South Atlantic, in terms of angler days, decreased substantially in Florida through Georgia (39% decline) and in North Carolina (28% decline). In South Carolina, there were modest fluctuations in headboat effort during this time period (Table 3.3.2.5). In 2020, all South Atlantic states experienced 5-year lows, likely as result of COVID-19 closures and disruptions. Headboat effort was the highest, on average, during the summer months of June through August (Table 3.3.2.6).

Table 3.3.2.5. South Atlantic headboat angler days and percent distribution by state (2016 - 2020).

	Angler Days			Percent Distribution		
	FL/GA*	NC	SC	FL/GA	NC	SC
2016	196,660	21,565	42,207	75.5%	8.3%	16.2%
2017	126,126	20,170	36,914	68.8%	11.0%	20.1%
2018	120,560	16,813	37,611	68.9%	9.6%	21.5%
2019	119,712	15,546	41,470	67.7%	8.8%	23.5%
2020	84,005	14,154	34,080	63.5%	10.7%	25.8%
Average	129,413	17,650	38,456	68.9%	9.7%	21.4%

Source: NMFS SRHS (March 2022).
*East Florida and Georgia are combined for confidentiality purposes.
Note: 2020 estimates reflect closures and interruptions to service as a result of COVID-19.

Table 3.3.2.6. South Atlantic headboat angler days and percent distribution by month (2016 through 2020).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Headboat Angler Days (in thousands)											
2016	9.8	12.2	23.9	22.2	27.4	37.5	45.7	29.2	17.1	9.2	12.8	13.4
2017	7.7	10.1	13.4	17.4	19.4	27.1	33.4	21.0	6.7	8.9	8.9	9.3
2018	4.4	9.9	14.1	15.2	13.3	29.0	30.2	26.2	9.7	8.1	7.7	7.2
2019	7.7	8.5	15.2	15.6	19.4	26.6	32.9	20.2	6.7	9.0	8.6	6.4
2020	6.9	7.8	8.4	0.4	8.7	23.3	26.6	16.3	11.0	9.9	6.3	6.7
Avg	7.3	9.7	15.0	14.2	17.6	28.7	33.8	22.6	10.2	9.0	8.9	8.6
	Percent Distribution											
2016	3.8%	4.7%	9.2%	8.5%	10.5%	14.4%	17.6%	11.2%	6.6%	3.5%	4.9%	5.1%
2017	4.2%	5.5%	7.3%	9.5%	10.6%	14.8%	18.2%	11.5%	3.6%	4.9%	4.9%	5.1%
2018	2.5%	5.6%	8.0%	8.7%	7.6%	16.6%	17.3%	15.0%	5.6%	4.6%	4.4%	4.1%
2019	4.4%	4.8%	8.6%	8.8%	11.0%	15.0%	18.6%	11.4%	3.8%	5.1%	4.9%	3.6%
2020	5.2%	5.9%	6.4%	0.3%	6.6%	17.6%	20.1%	12.3%	8.3%	7.5%	4.7%	5.1%
Avg	4.0%	5.3%	7.9%	7.2%	9.2%	15.7%	18.4%	12.3%	5.6%	5.1%	4.8%	4.6%

Source: NMFS SRHS (March 2022).
Note: 2020 estimates reflect closures and interruptions to service as a result of COVID-19.

Economic Value

Participation, effort, and harvest are indicators of the value of saltwater recreational fishing. However, a more specific indicator of value is the satisfaction that anglers experience over and above their costs of fishing. The monetary value of this satisfaction is referred to as consumer surplus (CS). The value or benefit derived from the recreational experience is dependent on several quality determinants, which include fish size, catch success rate, and the number of fish kept. These variables help determine the value of a fishing trip and influence total demand for recreational fishing trips. The estimated values of the CS per fish for a second[23], third, fourth,

[23] The study only considered trips with at least one fish caught and kept in its experimental design; thus, an estimated value for the first caught and kept fish is not available.

and fifth king mackerel kept on a trip are approximately $111, $74, $55, and $43, respectively (Carter and Liese 2012; values updated to 2021 dollars). [24]

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

Estimates of average annual gross revenue for charter vessels and headboats in 2009 are provided in Savolainen, et al. (2012). In 2021 dollars, the average annual gross revenue for a Gulf headboat is approximately $286,000 while the average annual gross revenue for a Gulf charter vessel is approximately $94,000. More recent estimates of average annual gross revenue for Gulf headboats are provided in Abbott and Willard (2017) and D. Carter (pers. comm., March 15, 2018). Abbott and Willard (2017) suggest that Savolainen, et al.'s estimate of average annual gross revenue for headboats may be an underestimate as data in the former suggest that average gross revenue in 2009 for the vessels in their sample was approximately $506,000 (2021 dollars). Further, their data suggests average annual gross revenue per vessel had increased to approximately $611,000 (2021 dollars) by 2014. However, Abbott and Willard's estimates are based on a sample of 17 headboats that chose to participate in the Headboat Collaborative Program in 2014, while Savolainen, et al.'s are based on a random sample of 20 headboats. The headboats that participated in the Collaborative may be economic highliners, in which case Abbott and Willard's estimates would overestimate average annual gross revenue for Gulf headboats. D. Carter (pers. comm., March 15, 2018) recently estimated that average annual gross revenue for Gulf headboats was approximately $451,000 (2021 dollars) in 2017. This estimate is likely the best current estimate of annual gross revenue for Gulf headboats as it is based on a relatively large sample of 63 boats, or more than 90% of the active fleet, and is more recent. For charter vessels and headboats operating in the South Atlantic, Holland et al. (2012) estimated average annual gross revenue at approximately $132,000 and $234,000 (2021 dollars), respectively.

However, gross revenues overstate the annual economic value and profits generated by for-hire vessels. Economic value for for-hire vessels can be measured by annual producer surplus (PS). In general, PS is the amount of money a vessel owner earns in excess of variable (trip) costs. Economic profit is the amount of money a vessel owner earns in excess of variable and fixed costs, inclusive of all implicit costs, such as the value of a vessel owner's time as captain and as entrepreneur, and the cost of using physical capital (i.e., depreciation of the vessel and gear). In 2021 dollars, Savolainen, et al. (2012) estimated the annual PS for Gulf headboats and charter vessels was approximately $200,000 and $62,000, respectively. Their best estimates of economic profit were $84,000 and $28,000 (2021 dollars), respectively.[25] Estimates of PS and economic profit for headboats are not available from Abbott and Willard (2017) or D. Carter (pers. comm., March 15, 2018), as they did not collect comprehensive cost data at the vessel

[24] Converted to 2021 dollars using the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

[25] Although Savolainen, et al. (2012) account for all explicit variable and fixed costs, they do not account for implicit costs, and thus they over-estimate actual economic profits for these vessels.

level.[26] Comparable estimates of annual PS and economic profit for South Atlantic charter vessels and headboats are not available either.

With regard to for-hire trips, economic value can be measured by PS per angler trip, which represents the amount of money that a vessel owner earns in excess of the cost of providing the trip. Estimates of revenue, costs, and trip net revenue for trips taken by charter vessels and headboats in 2017 are available from Souza and Liese (2019). They also provide estimates of trip net cash flow per angler trip, which are an approximation of PS per angler trip. According to Table 3.3.2.7, after accounting for transactions fees, supply costs, and labor costs, net revenue per trip was 42% of revenue for Gulf charter vessels, 40% of revenue for South Atlantic charter vessels, and 54% of revenue for Southeast headboats, or $823, $583, and $1,912 (2021 dollars), respectively. Given the respective average number of anglers per trip for each fleet, PS per trip is estimated to be $150 for Gulf charter vessels, $124 for South Atlantic charter vessels, and $72 for Southeast headboats.

Table 3.3.2.7. Trip-level economics for offshore trips by Gulf and South Atlantic charter vessels and Southeast headboats in 2017 (2021 dollars).

	Gulf Charter Vessels	South Atlantic Charter Vessels	Southeast Headboats*
Revenue	100%	100%	100%
Transaction Fees (% of revenue)	3%	3%	6%
Supply Costs (% of revenue)	27%	29%	19%
Labor Costs (% of revenue)	27%	28%	22%
Net Revenue per trip including Labor costs (% of revenue)	42%	40%	54%
Net Revenue per Trip	$823	$583	$1,912
Average # of Anglers per Trip	5.5	4.7	26.6
Trip Net Cash Flow per Angler Trip	$150	$124	$72

Source: Souza and Liese (2019).
*Although Souza and Liese (2019) break headboats out by sub-region, the South Atlantic sample size is small and thus estimates for Southeast headboats in general (Gulf and South Atlantic combined) are presented here.

Business Activity

The desire for recreational fishing generates economic activity as consumers spend their income on various goods and services needed for recreational fishing. This spurs economic activity in the region where recreational fishing occurs. It should be clearly noted that, in the absence of the opportunity to fish, the income would presumably be spent on other goods and services, and

[26] Abbott and Willard (2017) do report revenue net of fuel costs, but this ignores important costs such as processing fees, commissions, ice, bait, tackle, and labor.

these expenditures would similarly generate economic activity in the region where the expenditures occur. As such, the analysis below represents a distributional analysis only.

Estimates of the business activity (economic impacts) associated with recreational angling for Gulf king mackerel were calculated using average trip-level impact coefficients derived from the 2017 Fisheries Economics of the U.S. report (NMFS 2021) and underlying data provided by the NOAA Office of Science and Technology. Economic impact estimates in 2017 dollars were adjusted to 2021 dollars using the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

Business activity (economic impacts) for the recreational sector is characterized in the form of jobs (full- and part-time), income impacts (wages, salaries, and self-employed income), output impacts (gross business sales), and value-added impacts (contribution to the GDP in a state or region). Estimates of the average annual economic impacts (2016-2020) resulting from Gulf king mackerel target trips are provided in Table 3.3.2.8. The average impact coefficients, or multipliers, used in the model are invariant to the "type" of effort (e.g., target or catch) and can therefore be directly used to measure the impact of other effort measures such as king mackerel catch trips. To calculate the multipliers from Table 3.3.2.8, simply divide the desired impact measure (sales impact, value-added impact, income impact, or employment) associated with a given state and mode by the number of target trips for that state and mode.

The estimates provided in Table 3.3.2.8 only apply at the state-level. Addition of the state-level estimates to produce a regional (or national) total may underestimate the actual amount of total business activity, because state-level impact multipliers do not account for interstate and interregional trading. It is also important to note that these economic impacts estimates are based on trip expenditures only and do not account for durable expenditures. Durable expenditures cannot be reasonably apportioned to individual species. As such, the estimates provided in Table 3.3.2.8 may be considered a lower bound on the economic activity associated with those trips that targeted Gulf king mackerel.

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

Table 3.3.2.8. Estimated annual average economic impacts (2016-2020) from recreational trips that targeted Gulf king mackerel, by state and mode, using state-level multipliers. All monetary estimates are in 2021 dollars in thousands.

	FL*	AL	MS	LA	TX
	Charter Mode				
Target Trips	37,233	3,755	127	57	1,699
Value Added Impacts	$13,568	$1,629	$59	$28	$716
Sales Impacts	$22,784	$2,963	$112	$53	$1,190
Income Impacts	$7,928	$929	$34	$17	$401

	FL*	AL	MS	LA	TX
Employment (Jobs)	201	31	1	1	10
	Private/Rental Mode				
Target Trips	358,007	54,713	2,441	1,268	8,578
Value Added Impacts	$13,443	$2,576	$56	$197	$1,529
Sales Impacts	$20,835	$3,986	$92	$337	$2,520
Income Impacts	$7,054	$1,003	$29	$106	$782
Employment (Jobs)	183	35	1	3	17
	Shore Mode				
Target Trips	578,509	345,571	0	N/A	N/A
Value Added Impacts	$22,073	$25,404	$0	N/A	N/A
Sales Impacts	$34,495	$43,751	$0	N/A	N/A
Income Impacts	$11,627	$13,073	$0	N/A	N/A
Employment (Jobs)	304	429	0	N/A	N/A
	All Modes				
Target Trips	973,748	404,039	2,568	1,324	10,278
Value Added Impacts	$49,083	$29,609	$115	$225	$2,246
Sales Impacts	$78,114	$50,700	$204	$390	$3,710
Income Impacts	$26,610	$15,004	$63	$123	$1,184
Employment (Jobs)	688	495	2	3	27

Source: Effort data from MRIP, LDWF Recreational Creel Survey, and TPWD Marine Sport-Harvest Monitoring Program; economic impacts results calculated by NMFS SERO using NMFS (2021) and underlying data provided by the NOAA Office of Science and Technology.
*Includes impacts from all trips that targeted Gulf king mackerel, including throughout Monroe County, FL.
Note1: Headboat information is unavailable.
Note2: TX shore mode data is not available.
Note3: Private and shore modes are combined in the LDWF Recreational Creel Survey and are presented here together under the Private/Rental Mode for LA. This may bias the estimated economic impacts associated with shore trips upwards.

3.4 Description of the Social Environment

This framework amendment affects the commercial and recreational management of Gulf king mackerel. This section provides community background and current descriptions of Gulf King mackerel fishing for which the proposed actions will be evaluated in Chapter 4.

The following description includes commercial and recreational king mackerel landings and commercial and federal for-hire permits by state in order to provide information on the geographic distribution of fishing involvement. Descriptions of the top communities involved in commercial fishing for king mackerel are included, along with the top recreational fishing communities based on recreational engagement and reliance, top ranking communities by the

number of commercial permits, and the top ranking communities by the number of federal for-hire permits. Community level data are presented in order to meet the requirements of National Standard 8 of the 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

Permits

Commercial king mackerel permits are held by individuals in the Gulf, South Atlantic, and Mid-Atlantic, New England, and other states. Individuals in the Gulf hold approximately 37.7% of commercial king mackerel permits (SERO permit office, 2020). Within the Gulf, the majority of commercial king mackerel permits are held by individuals in Florida (29.7%, includes the west coast of Florida and the Florida Keys), followed by Louisiana (3.2%), Alabama (2.2%), Texas (2.1%), and Mississippi (0.5%). Commercial king mackerel permits are held by individuals with mailing addresses in 256 communities, located in 16 states. Commercial king mackerel gillnet endorsements are held by individuals located in four communities (Hernando Beach, Key West, Marathon, and Suwannee) along the west coast of Florida and in the Florida Keys.

Communities in the Gulf with the most commercial king mackerel permits are located in Florida, Texas, Louisiana, and Alabama (Table 3.4.1.1). The communities with the most commercial king mackerel permits are Key West, Florida (7% of commercial king mackerel permits); Panama City, Florida (2.9%); and Destin, Florida (2.2%).

Table 3.4.1.1. Top communities by number of commercial king mackerel permits.

State	Community	Permits
FL	Key West	100
FL	Panama City	42
FL	Destin	31
FL	Marathon	18
TX	Galveston	16
FL	Naples	15
FL	St. Petersburg	15
FL	Pensacola	12
LA	Grand Isle	12
FL	Panama City Beach	11
AL	Dauphin Island	10
FL	Hernando Beach	9
FL	Big Pine Key	9
FL	Cortez	9
FL	Key Largo	9
FL	Tarpon Springs	9
FL	Madeira Beach	8
FL	Summerland Key	8
FL	Islamorada	7

Source: SERO permit office, 2020.

Landings

The majority of Gulf commercial king mackerel landings are from waters adjacent to Florida (average of approximately 81.1% from 2016-2020), followed by Louisiana (13.3%), Alabama (3.7%), Texas (1.7%), and Mississippi (0.2%, SEFSC Commercial ACL Data).

The regional quotient (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 king mackerel 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.

The top Gulf king mackerel communities are located in Florida, Louisiana, and Alabama (Figure 3.4.1.1). The majority of Gulf king mackerel is landed in the top two communities of Destin, Florida and Key West, Florida, representing about 74% of landings and 77% of the Gulf-wide ex-vessel value for the species. Naples, Florida ranks third in terms of pounds RQ for Gulf king mackerel, representing about 8% of landings and 8% of value.

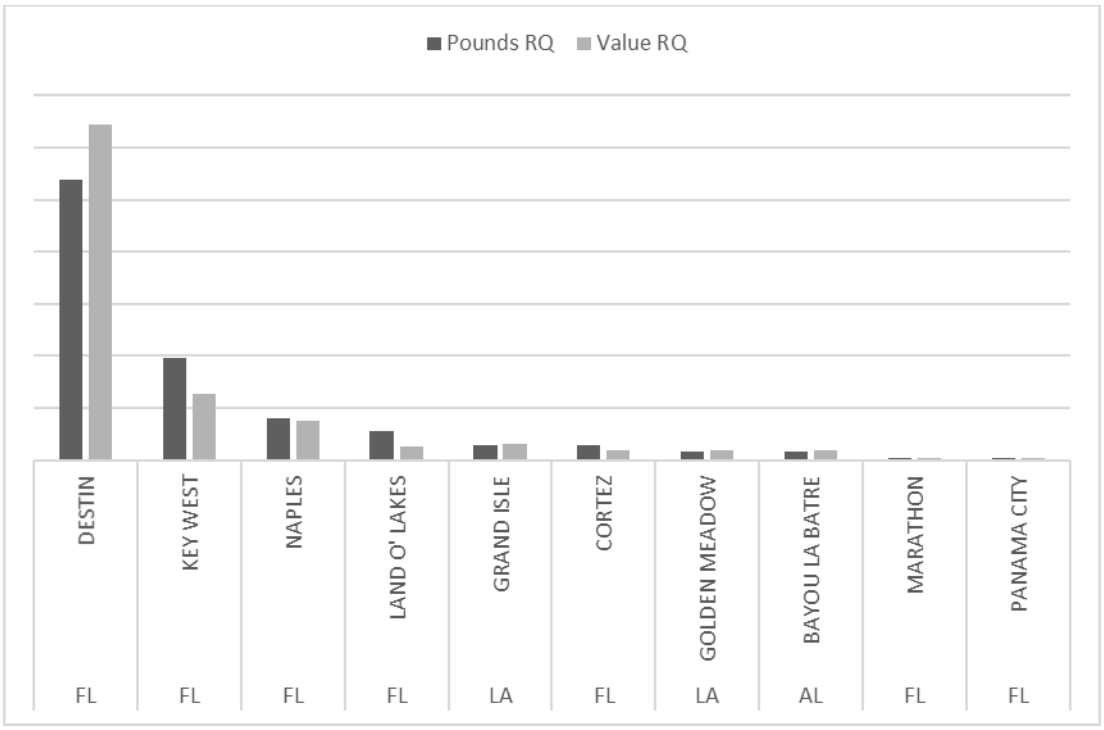

Figure 3.4.1.1. Top Gulf communities ranked by pounds and value RQ of king mackerel. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2020.

3.4.2 Recreational Sector

Permits

The majority of Gulf CMP for-hire permits are held by individuals in Florida (61.3%), followed by Texas (15.7%), Alabama (11%), Louisiana (8.4%), Mississippi (2.2%), and other states (1.4%, SERO permit office, 2020). Gulf CMP for-hire permits are held by individuals with mailing addresses in 213 communities, located in 15 states.

Communities with the most Gulf CMP for-hire permits are located in Florida, Alabama, Texas, and Louisiana (Table 3.4.2.1). The communities with the most Gulf CMP for-hire permits are Destin, Florida (4.6% of Gulf CMP for-hire permits); Panama City, Florida (4.3%); and Orange Beach, Alabama (4%).

Table 3.4.2.1. Top communities by number of federal Gulf CMP for-hire permits, including historical captain permits.

State	Community	Permits
FL	Destin	102
AL	Orange Beach	100
FL	Panama City	53
TX	Galveston	49
FL	Key West	48
LA	Venice	46
FL	Naples	44
TX	Freeport	38
TX	Port Aransas	32
FL	Clearwater	31
FL	Panama City Beach	31
FL	Pensacola	27
FL	St. Petersburg	26
FL	Sarasota	20
FL	Madeira Beach	19
AL	Dauphin Island	18
MS	Biloxi	18
FL	Crystal River	17
FL	Marco Island	17

Source: SERO permit office, 2020.

Landings

The greatest proportion of Gulf recreational king mackerel landings are from waters adjacent to Florida (average of approximately 72.3% from 2016-2020), followed by Alabama (19.9%), Texas (5.6%), and Louisiana and Mississippi (2.2%, SEFSC Recreational MRIP-FES Data)

Engagement and Reliance

Landings for the remainder of the recreational sector are not available by species at the community level, making it difficult to identify communities as dependent on recreational fishing for king mackerel. Because limited data are available concerning how recreational fishing communities are engaged and reliant on specific species, indices were created using secondary data from permit and infrastructure information for the southeast recreational fishing sector at the community level (Jepson and Colburn 2013, Jacob et al. 2013). Recreational fishing engagement is represented by the number of recreational permits and vessels designated as "recreational" by homeport and owners address. Fishing reliance includes the same variables as fishing engagement, divided by population. Factor scores of both engagement and reliance were plotted by community.

Figure 3.4.2.1 identifies the top Gulf communities that are engaged and reliant upon recreational fishing in general. Two thresholds of one and one-half standard deviation above the mean were plotted to help determine a threshold for significance. Communities are presented in ranked order by fishing engagement and all 20 included communities demonstrate high levels of recreational engagement, although this is not specific to fishing for king mackerel. Because the analysis used discrete geo-political boundaries, Panama City and Panama City Beach had separate values for the associated variables. Calculated independently, each still ranked high enough to appear in the top 20 list suggesting a greater importance for recreational fishing in that area.

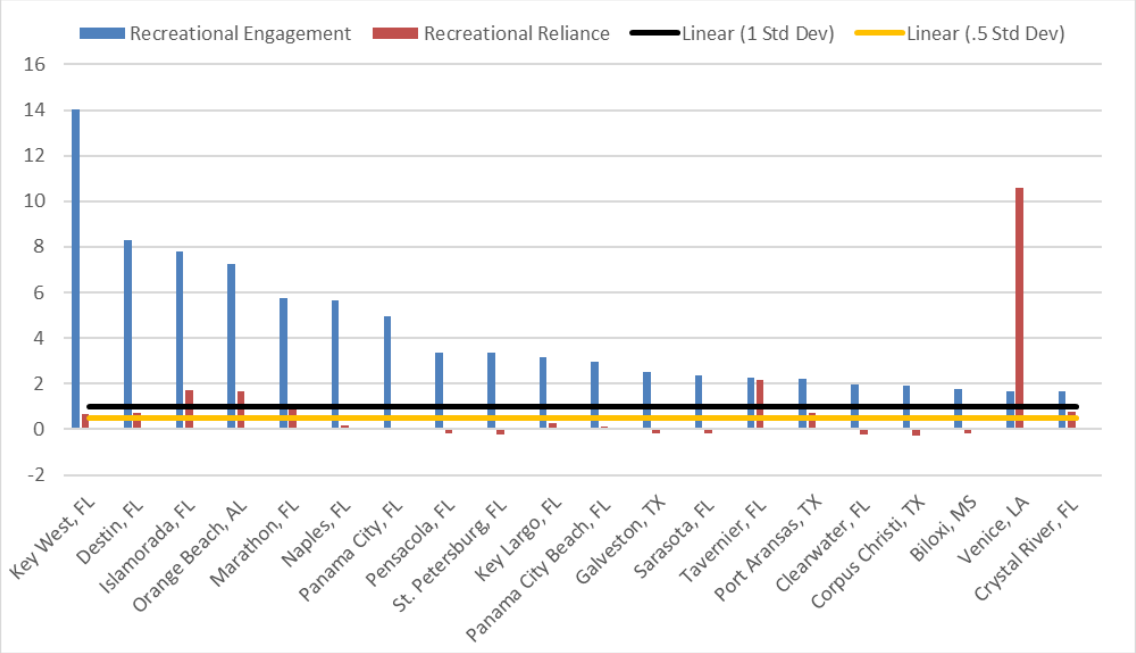

Figure 3.4.2.1. Top 20 Gulf recreational fishing communities' engagement and reliance.
Source: SERO, Community Social Vulnerability Indicators Database 2019.

The brief description of fishing activities presented here highlights which communities may be most involved in Gulf king mackerel fishing. It is expected that the impacts from the regulatory action in this framework amendment, whether positive or negative, will most likely affect those communities identified above.

3.4.3 Environmental Justice, Equity, and Underserved Communities

Federal agencies are required to consider the impacts and/or address the inequalities of their policies on minority populations, low-income populations, disadvantaged communities, and/or underserved communities. These requirements are outlined in the following Executive Orders (E.O.).

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).

E.O. 13985 requires federal agencies to recognize and work to redress inequalities in their policies and programs that serve as barriers to equal opportunity, including pursuing a comprehensive approach to advancing equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. Federal agencies must assess how programs and policies perpetuate systemic barriers to opportunities and benefits to people of color and other underserved groups in order to equip agencies to develop policies and programs that deliver resources and benefits equitably to all.

E.O. 13985 provides definitions for equity and underserved communities, which expand the definition of a community from being geographically situated, or place-based, as defined through the Magnuson-Stevens Act, to also include communities that share a particular characteristic (e.g., crew of commercial king mackerel fishing vessels). Equity means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. The term ''underserved communities'' refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list in the preceding definition of ''equity.''

E.O. 14008 calls on agencies to make achieving EJ part of their missions "by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts."
Census data are available to examine the status of communities with regard to minorities and low-income populations. These data describe geographically based communities (e.g., Panama City, Florida) and are descriptive of the total population, not limited to the fishing components of the community. Information is not available at this time to examine the status of underserved populations engaged in Gulf fisheries. To help assess whether EJ concerns may be present within regional place-based communities, a suite of indices were created using census data to examine the social vulnerability of coastal communities. The three indices are poverty, population composition, and personal 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.

Figures 3.4.3.1 and 3.4.3.2 provide social vulnerability rankings for commercial and recreational place-based communities identified in Section 3.4 as important to fishing for king mackerel specifically (commercial sector) or fishing for coastal migratory pelagics in general (recreational sector). Two communities exceed the threshold of one standard deviation above the mean for all three indices, Bayou La Batre, Alabama and Freeport, Texas. One community exceeds the threshold of one standard deviation above the mean for any of the indices (Crystal River, Florida). These communities would be the most likely to exhibit vulnerabilities to social or economic disruption resulting from regulatory change.

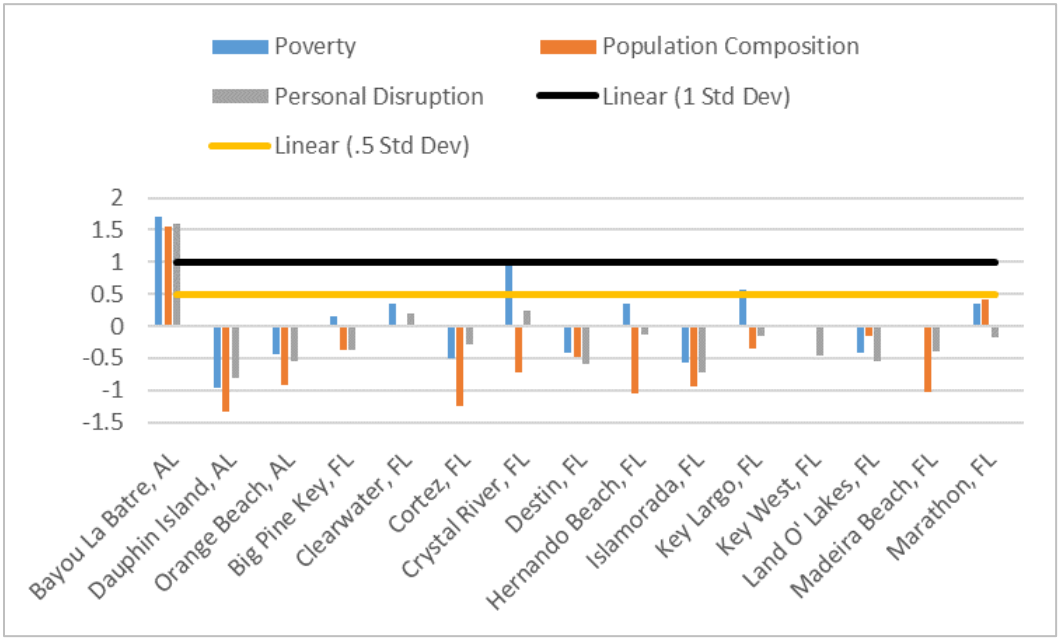

Figure 3.4.3.1. Social vulnerability indices for top commercial and recreational king mackerel and CMP communities.
Source: SERO, Community Social Vulnerability Indicators Database 2018.

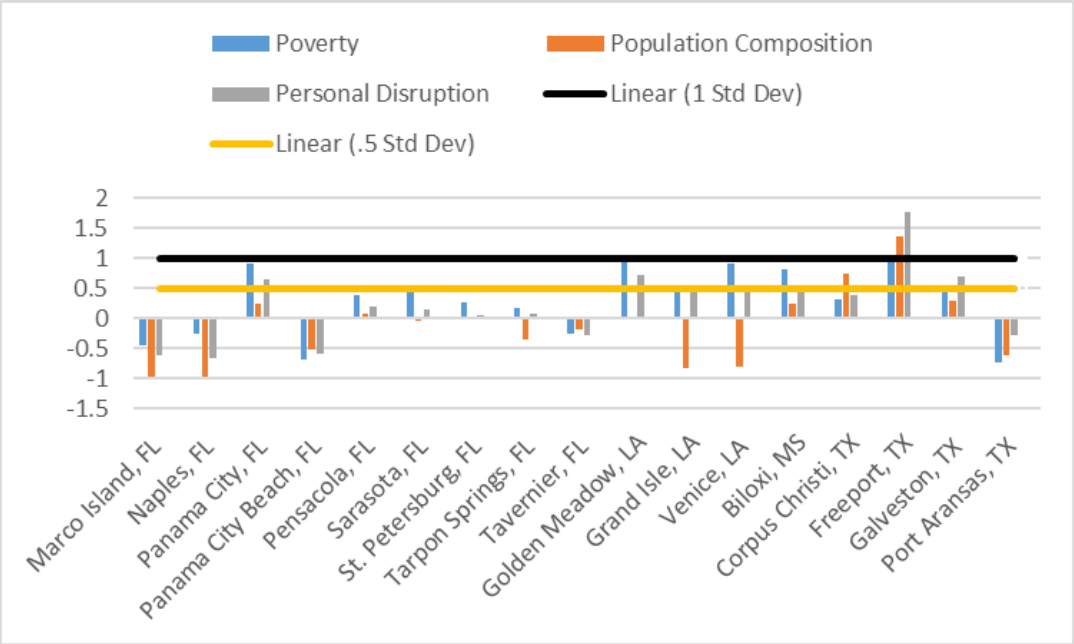

Figure 3.4.3.2. Social vulnerability indices for top commercial and recreational king mackerel and CMP communities continued.
Source: SERO, Community Social Vulnerability Indicators Database 2018.

People in these communities may be affected by fishing regulations in two ways: participation and employment. Although the place-based communities identified in Figures 3.4.3.1 and 3.4.3.2 may have the greatest potential for EJ concerns, complete data are not available on the race and income status for those involved in the local fishing industry (employment), or for their dependence on king mackerel specifically (participation). The potential effects of the actions on non-place based communities, such as commercial fishermen and recreational stakeholders are discussed in Sections 4.1.4. There are no known populations that rely on the consumption of king mackerel for subsistence. 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. The EEZ is defined as an area extending 200 nautical miles from the seaward boundary of each of the coastal states. The Magnuson-Stevens Act also claims authority over U.S. anadromous species and continental shelf resources that occur beyond the EEZ.

Responsibility for federal fishery management decision-making is divided between the Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing,

monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring management measures are consistent with the Magnuson-Stevens Act and with other applicable laws summarized in Section 10. In most cases, the Secretary has delegated this authority to NMFS.

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

The Gulf Council consists of seventeen voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NMFS. The public is also involved in the fishery management process.

3.5.2 State Fishery Management

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

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

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

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action: Modify the Gulf of Mexico (Gulf) Migratory Group King Mackerel (Gulf King Mackerel) Overfishing Limit (OFL), Acceptable Biological Catch (ABC), and Annual Catch Limit (ACL).

Alternative 1: No Action. Retain the current OFL, ABC, and total ACL for Gulf king mackerel as established in Amendment 26 to the Fishery Management Plan (FMP) for Coastal Migratory Pelagic (CMP) Resources in the Gulf of Mexico and Atlantic Regions (CMP FMP). The Gulf king mackerel total ACL is equal to the ABC recommended by the Gulf Scientific and Statistical Committee (SSC) for 2015/2016 – 2019/2020 and subsequent fishing years.

Fishing Year	OFL	ABC	Total ACL	Rec ACL	Comm ACL
2019/2020+	8.95	8.55	8.55	5.81	2.74
2019/2020+ MRIP-FES equivalent	11.96	11.54	11.54	7.85	

Catch limit values are in millions of pounds (mp), landed weight (lw)
Note: The recreational portion of the current OFL, ABC, and ACL is based on Marine Recreational Information Program (MRIP) Coastal Household Telephone Survey (CHTS) data. The recreational portion of the MRIP Fishing Effort Survey (FES) equivalent was calculated in 2021 by the Southeast Fisheries Science Center (SEFSC) and is provided for comparison only. There is not an equivalent MRIP-FES commercial ACL, since the effort estimation for the commercial sector is unchanged.

Alternative 2: Revise the OFL and ABC for Gulf king mackerel as recommended by the Gulf SSC for 2021/2022 – 2023/2024 and subsequent fishing years. Retain the total ACL being set equal to the ABC; an annual catch target (ACT) is not used.

Fishing Year	OFL	ABC	Total ACL	Rec ACL	Comm ACL
2021/2022	10.89	9.37	9.37	6.37	3.00
2022/2023	11.05	9.72	9.72	6.61	3.11
2023/2024+	11.18	9.99	9.99	6.79	3.20

Catch limit values are in mp lw. Note: OFL and ABC as recommended by the Gulf SSC in mp ww. The recreational portion of the OFL, ABC, and ACL are based on MRIP-FES data.

Note: Landings are reported in landed weight, meaning whole weight and gutted weight are combined. Therefore, while the OFL, and ABC were recommended by the Gulf Council SSC in lbs ww, ACLs and quotas will be in landed weight consistent with current regulations.

4.1.1 Direct and Indirect Effects on the Physical Environments

King mackerel are usually caught at the ocean surface and therefore neither hook-and-line nor run-around gillnet gear typically come in contact with bottom habitat. However, these gear types have the potential to snag and entangle bottom structures and cause tear-offs or abrasions

(Barnette 2001). If gear is lost or improperly disposed of, it can entangle marine life. Entangled gear often becomes fouled with algal growth. If fouled gear becomes entangled on corals, the algae may eventually overgrow and kill the coral.

Modifications to the OFL, ABC, and ACLs as proposed in Action 1 are not expected to result in significant effects on the physical environment. Despite the OFL, ABC, and ACLs proposed in **Alternative 2** seeming higher than the current catch levels (**Alternative 1**), they incorporate the transition to the Marine Recreational Information Program's (MRIP) Fishing Effort Survey (FES) from the Coastal Household Telephone Survey (CHTS); FES estimates greater recreational fishing effort than that historically estimated by CHTS. Thus, the recreational ACL is reduced while the commercial ACL increases. Had SEDAR 38 (2014) used MRIP-FES data, the catch limits under **Alternative 1** would be approximately 16% higher than what is currently being proposed in **Alternative 2** for 2022/2023, the fishing year the rule for this document is expected to be implemented. The reduced catch limits in **Alternatives 2** result from a model correction of the virgin biomass estimate in the assessment model (Appendix B) and decreased recruitment in recent years.[27] Furthermore, fishing for Gulf king mackerel is typically directly targeted by both fishing sectors; thus, the effects on the physical environment are not expected to be measurably different from the no action, although a slight decrease may occur. This is due to fishermen from either sector being able to stop fishing for this species if they want. A slight decrease may occur due to fishing for king mackerel stopping sooner under the lower catch limits and less gear time in the water for this species. However, fishing effort may be directed to other species.

4.1.2 Direct and Indirect Effects on the Biological/Ecological Environment

Management actions that affect the biological environment mostly relate to the impacts of fishing on a species' population size, life history, and the role of the species within its habitat. Removal of fish from the population through fishing can reduce the overall population size if harvest is not maintained at sustainable levels. Indirect impacts of these alternatives on the biological environment would depend on the resulting reduction or increases in the level of fishing as a result of each alternative.

Modifications to the Gulf king mackerel OFL, ABC, and ACL could result in changes to the biological/ecological effects, as changing these catch limits determined the amount of fish that can be harvested. **Alternative 1** would retain the current stock ACL for Gulf king mackerel of 8.55 mp in MRIP-CHTS units. Continuing to harvest Gulf king mackerel at the levels described in **Alternative 1** could result in harvest levels above those recommended by the SSC and may further reduce the spawning stock biomass (SSB). **Alternative 2** would set the total ACL equal to the ABCs recommended by the Gulf Scientific and Statistical Committee (SSC), based on SEDAR 38 Update. Catch limits proposed in **Alternatives 2** incorporate MRIP-FES data, and constitute a reduction in the stock catch limits compared to the **Alternative 1**. This reduction in Gulf king mackerel harvest is expected to have beneficial effects to the biological and ecological environment, as the reduction in fishing mortality is expected to help increase the SSB to a healthier level. Based on the present level of recreational fishing effort and landings for Gulf

[27] http://sedarweb.org/docs/suar/KGM_GOM_SA_09082020_final_v5.pdf

king mackerel and considering the current magnitude of commercial landings, it is highly unlikely that the ABC/total stock ACL would be met. From a sector-specific standpoint, a recreational ACL would not likely be reached; however, the commercial sector has typically caught its ACL (Table 1.1.1). **Alternative 2** allows for a yearly increase in allowable harvest of Gulf king mackerel, which is expected to allow for an increase in recruitment, and is more conservative than **Alternative 1**. Thus, under **Alternative 2**, lower directed fishing effort is expected to positively affect the biological environment by protecting against overharvest and allowing the SSB to build over time towards SSB at maximum sustainable yield. However, any effects are not expected to be significant because the overall prosecution of the CMP fishery is not expected to change. For this same reason, no additional impacts to Endangered Species Act (ESA)-listed species or other non-target species are anticipated as a result of this action.

4.1.3 Direct and Indirect Effects on the Economic Environment

Commercial Sector

Alternative 1 (No Action) would maintain the Gulf king mackerel commercial ACL of 2,740,000 lbs lw. No changes to the commercial sector would be expected to result under **Alternative 1**. In comparison to the current commercial ACL from **Alternative 1**, **Alternative 2** would increase the commercial ACL to 3,110,400 lbs lw for the 2022/2023 fishing year and to 3,196,800 lbs lw for the 2023/2024 and subsequent fishing years. The commercial zone-specific ACLs would therefore change as well under **Alternative 2**; these changes are displayed in Table 4.1.3.1. Since the southern handline zone ACL and southern gillnet zone ACL are each 21% of the commercial sector's ACL, the two zones experience identical increases.

Table 4.1.3.1. Changes in the Gulf commercial sector ACL and in the Gulf commercial zone-specific ACLs, as the difference between **Alternative 2** and **Alternative 1**. Catch limits are expressed as lbs lw.

Fishing Year	Change in Comm ACL	Change in Western Handline ACL	Change in Northern Handline ACL	Change in Southern Handline ACL	Change in Southern Gillnet ACL
2022/2023	370,400	148,160	66,672	77,784	77,784
2023/2024+	456,800	182,720	82,224	95,928	95,928

In order to calculate expected changes in commercial consumer surplus (CS), own-price flexibility[28] for the king mackerel commercial fishery would be required to derive the expected average price change. Otherwise, price is assumed constant with changes in the commercial ACL. To our knowledge, information on own-price flexibility for the king mackerel commercial fishery does not currently exist. If the expected average price change is zero, then multiplying that by the change in the commercial ACL to arrive at the expected change in commercial CS would result in a value of zero.

[28] The own-price flexibility is the percentage change in a product's price relative to the percentage change of a product's quantity sold. This shows the responsiveness of a product's price to the quantity being sold.

To determine the respective expected changes in ex-vessel revenue as a result of the proposed changes to the commercial ACL, the average annual price per lb gw of $2.25 for Gulf king mackerel from 2016-2020 (2021 dollars) is multiplied by the change in the commercial sector ACL and by the change in the zone-specific ACLs. These expected changes in revenue are displayed in Table 4.1.3.2. As noted in the discussion for the commercial CS, if an expected average price change were available, it would also be used in determining the expected changes in revenue. The percentage of ACL landed by the commercial sector, shown in Table 1.1.2, has ranged from 98.4% to 106.7% for the 2016/2017 to 2019/2020 fishing years. Therefore, it is reasonable to assume that the commercial sector will harvest all of the commercial ACL, while recognizing that the individual commercial zones vary with respect to the percentage of zone-specific ACL landed. For the purpose of calculating expected changes in zone-specific revenue, the analysis also assumes that landings would not exceed the zone-specific ACL under **Alternative 1**.

Table 4.1.3.2. Expected changes in the commercial sector revenue and commercial zone-specific revenues, as the difference between **Alternative 2** and **Alternative 1**. Values are in 2021 dollars.

Fishing Year	Expected Change in Comm Revenue	Expected Change in Western Handline Revenue	Expected Change in Northern Handline Revenue	Expected Change in Southern Handline Revenue	Expected Change in Southern Gillnet Revenue
2022/2023	$833,400	$333,360	$150,012	$175,014	$175,014
2023/2024+	$1,027,800	$411,120	$185,004	$215,838	$215,838

The commercial producer surplus (PS) is estimated as 30.7% of the ex-vessel value, which is the average net cash flow from 2016-2018 for commercial vessels that harvested king mackerel in the Gulf (Liese and Overstreet 2021). The expected change in commercial PS is shown in Table 4.1.3.3. As the expected change in commercial PS is based on the expected change in commercial revenue, it also increases in the 2023/2024 and subsequent fishing years, compared with the 2022/2023 fishing year. Gulf king mackerel commercial landings have been, on average, 101.4% of the commercial sector's ACL across the 2015/2016 to 2019/2020 fishing years, as shown in Table 1.1.2. Therefore, it is expected that the commercial sector will have both its revenue and PS impacted in the short-term by the increased ACL. As the increased commercial ACL may lead to a lengthened fishing season for commercial vessels harvesting king mackerel in the Gulf, some vessels may delay switching to harvest other species, until Gulf king mackerel is closed for the fishing year.

Table 4.1.3.3. Expected changes in the commercial sector PS and in the commercial zone-specific PS, as the difference between **Alternative 2** and **Alternative 1**. Values are in 2021 dollars.

Fishing Year	Expected Change in Comm PS	Expected Change in Western Handline PS	Expected Change in Northern Handline PS	Expected Change in Southern Handline PS	Expected Change in Southern Gillnet PS
2022/2023	$255,854	$102,342	$46,054	$53,729	$53,729
2023/2024+	$315,535	$126,214	$56,796	$66,262	$66,262

Recreational Sector

Alternative 1 (No Action) would maintain the Gulf king mackerel recreational ACL of 5,810,000 lbs lw in MRIP-CHTS, which is equivalent to 7,847,200 lbs lw in MRIP-FES. No changes to the recreational sector would be expected to result under **Alternative 1**. In comparison to the MRIP-FES equivalent recreational ACL from **Alternative 1**, **Alternative 2** would decrease the recreational ACL to 6,609,600 lbs lw for the 2022/2023 fishing year and to 6,793,200 lbs lw for the 2023/2024 and subsequent fishing years. These reductions are shown in Table 4.1.3.4.

Table 4.1.3.4. Changes in the recreational sector ACL, as the difference between **Alternative 2** and the MRIP-FES equivalent for **Alternative 1**. Catch limits are expressed as lbs lw.

Fishing Year	Rec ACL (Alt 1) MRIP-FES	Rec ACL (Alt 2) MRIP-FES	Change in Rec ACL
2022/2023	7,847,200	6,609,600	-1,237,600
2023/2024+	7,847,200	6,793,200	-1,054,000

According to the law of diminishing marginal utility from the field of economics, willingness-to-pay (WTP) decreases for each additional fish retained by recreational fishermen. Therefore, it is useful to consider the bag limit distribution for king mackerel landed in the Gulf when selecting an appropriate WTP value to use for economic effects analysis. Figure 4.1.3.1 shows this distribution for the 2015/2016 through 2019/2020 fishing years. The majority of trips in the Gulf had recreational fishermen retaining 1 king mackerel per trip.

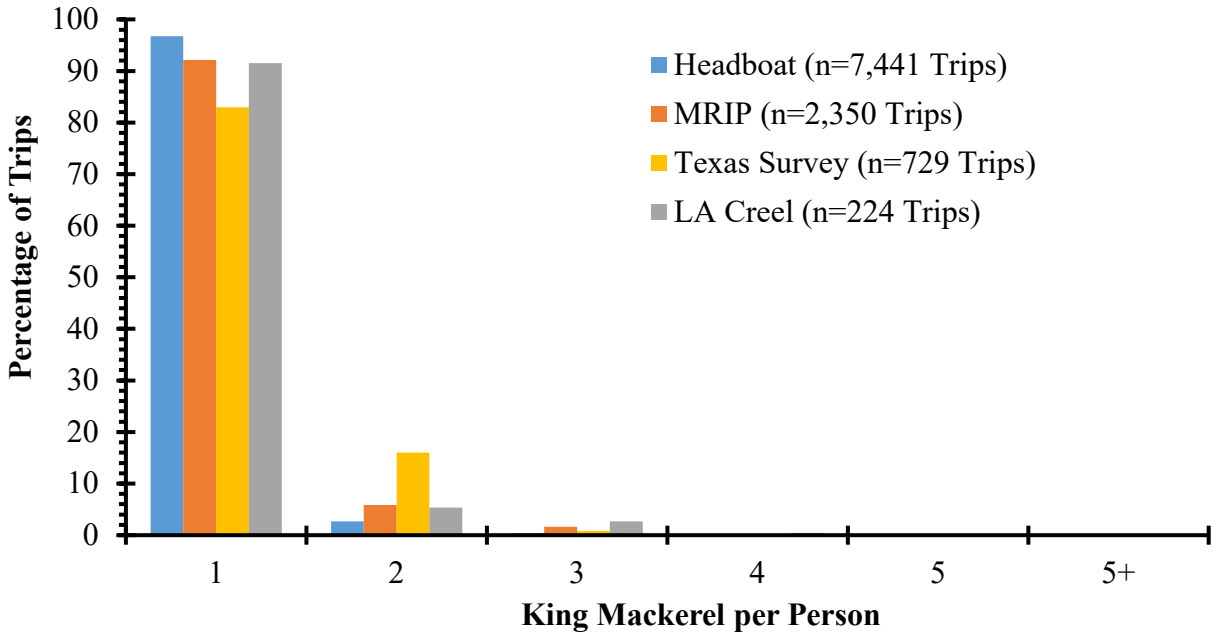

Figure 4.1.3.1 Gulf of Mexico king mackerel bag limit distribution from 2015/2016 through 2019/2020 fishing years.

Source: Marine Recreational Information Program, Southeast Region Headboat Survey, Texas Parks and Wildlife recreational survey, and Louisiana Department of Wildlife and Fisheries creel survey.

The estimated values of the consumer surplus (CS) for a second king mackerel kept on a recreational fishing trip is $111 (Carter and Liese 2012; values updated to 2021 dollars),[29] which reflects recreational WTP for that second fish. This might underestimate the WTP for Gulf recreational fishermen as a whole, since WTP decreases as additional fish are retained and the majority of Gulf recreational fishermen are retaining 1 king mackerel per trip. Estimated increases in economic value are approximated by multiplying the expected change in the number of fish harvested by this CS estimate. The expected change in the number of fish harvested is calculated by dividing the change in the recreational sector's ACL by 8.795 lbs whole weight, which is the average weight of a recreationally landed king mackerel in the Gulf from the 2015/2016 to 2019/2020 fishing years.[30] The expected changes in the recreational sector's CS are displayed in Table 4.1.3.5. Of note, these expected changes assume that that recreational sector would land the recreational ACL. However, the recreational sector has landed an average of 2,287,138 lbs lw (MRIP-CHTS) or 4,658,814 lbs lw (MRIP-FES) over the 2015/2016 to 2019/2020 fishing years, and these landings are below the proposed recreational sector ACL (in MRIP-FES) in **Alternative 2**. Therefore, in the short-term, the recreational sector is not expected to experience changes in its season length or resulting economic effects. Regarding the recreational sector's PS, the number of for-hire trips are not expected to be impacted, as there is no expected change in recreational season length. However, in the future, if season closures

[29] Converted to 2021 dollars using the annual, not seasonally adjusted Gross Domestic Product implicit price deflator provided by the U.S. Bureau of Economic Analysis.

[30] Data for average weights of a recreationally landed king mackerel in the Gulf were pooled from the Marine Recreational Information Program, Southeast Region Headboat Survey, Texas Parks and Wildlife recreational survey, and Louisiana Department of Wildlife and Fisheries creel survey.

result due to the reduced recreational ACL, this may result in some level of trip cancellations and lost for-hire trip net revenue.

Table 4.1.3.5. Expected change in the recreational sector's CS, based on the difference between the sector ACL under **Alternative 2** and the MRIP-FES equivalent for **Alternative 1**. Catch limits are expressed as lbs lw. CS values are in 2021 dollars.

Fishing Year	Change in Rec ACL	Change in Number of Fish	Expected Change in Rec CS
2022/2023	-1,237,600	-140,713	-$15,619,160
2023/2024+	-1,054,000	-119,838	-$13,302,032

Net economic benefits from the commercial and recreational sectors combined from **Preferred Alternative 2**, relative to **Alternative 1**, would be expected to decrease by $15,363,306 in the 2022/2023 fishing year and by $12,986,497 in the 2023/2024 and subsequent fishing years.

4.1.4 Direct and Indirect Effects on the Social Environment

The social effects that could arise from this action would relate to the degree to which fishing activity is affected from the change in catch levels. While the total Gulf king mackerel ACL has not been exceeded in the past 20 years (Table 1.1.1), the commercial sector ACL serves to limit harvest (Table 1.1.2) while the recreational sector's landings remain well below its sector ACL (Table 1.1.1). Table 4.1.4 provides the total and sector ACLs for **Alternatives 1** and **2**. Additional effects would not be expected under **Alternative 1** (No Action); the catch levels would remain at current levels and the recreational sector's ACL would remain in MRIP-CHTS units.

Table 4.1.4.1. Comparison of the total ACLs, recreational ACLs, and commercial ACLs under Alternatives 1 and 2. The sector allocation is 68% to the recreational sector and 32% to the commercial sector.

Fishing Year	Total ACL (lbs lw)	Rec ACL (lbs ww)	Comm ACL (lbs gw)
Alt 1: 2019/2020+ MRIP-CHTS	8,550,000	5,810,000	2,740,000
Alt 1: 2019/2020+ MRIP-FES equivalent	11,540,000	7,850,000	
Alt 2: 2021/2022 (MRIP-FES)	9,370,000	6,370,000	3,000,000
Alt 2: 2022/2023 (MRIP-FES)	9,720,000	6,610,000	3,110,000
Alt 2: 2023/2024+ (MRIP-FES)	9,990,000	6,790,000	3,200,000

Note: MRIP-CHTS and MRIP-FES refer to the recreational portion of the ACL, only.

Alternative 2 would revise the catch levels based on the most recent stock assessment and SSC recommendation, and includes the adoption of MRIP-FES units for the recreational sector. For the recreational sector, the catch levels under **Alternative 2** are understood to be a decrease from

which negative effects would be expected, while the transition from MRIP-CHTS to MRIP-FES units is a conversion and should not result in effects. However, the amount of the decrease that is attributed to the stock assessment is unclear due to the change in recreational data units at the same time, making it difficult to determine the extent of the expected effects. Further, the recreational sector harvest remains well below its sector ACL, despite the increase to the bag limit in 2017 (GMFMC 2016). Thus, it is not unlikely that **Alternative 2** would result in negative effects compared to **Alternative 1,** because the recreational sector would likely not harvest the decreased amount of fish available under **Alternative 2**. Positive effects would be expected for the commercial sector as the commercial sector ACL would increase 9.5% for the current fishing year (2021/2022), 13.5% for the 2022/2023 fishing year, and 16.8% for subsequent fishing years compared to **Alternative 1** (Table 4.1.4). However, the positive effects for the 2021/2022 fishing year would not be realized as the fishing year ends on June 30 for fishermen harvesting in the Western and Southern Zones, and on September 30 for fishermen harvesting in the Northern Zone.

4.1.5 Direct and Indirect Effects on the Administrative Environment

Modifying annual harvest levels including the OFL, ABC, and ACLs does not typically result in significant effects on the administrative environment. Although not substantial, **Alternative 1** is expected to adversely affect the administrative environment because it would continue the need to convert MRIP-FES data (how recreational landings for Gulf king mackerel are collected) into MRIP-CHTS units to compare landings to the ACL. **Alternative 2** would result in a short-term increased burden on the administrative environment due to the establishment of new catch limits. Changing the catch limits from **Alternative 1** would increase the burden for NMFS, which would have to engage in rulemaking to implement this change in management. However, **Alternative 2** would reduce the burden by eliminating the need to convert MRIP-FES data into MRIP-CHTS units to compare landings, as the ACL would also be in MRIP-FES units. The administrative burden for law enforcement would go largely unchanged, as law enforcement officers would continue to monitor compliance with any established catch limits. Some administrative burden is anticipated with respect to outreach as it relates to notifying stakeholders of the changes to catch limits.

4.1.6 Cumulative Effects

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. 1508.1(g)(3)). Below is our five-step cumulative effects analysis that identifies criteria that must be considered in an EA.

1. *The area in which the effects of the proposed action will occur* - The affected area of this proposed action encompasses the state and federal waters of the Gulf as well as Gulf communities that are dependent on CMP fishing. Most relevant to this proposed action is king mackerel and those who fish for them. For more information about the area in which the effects

of this proposed action will occur, please see Chapter 3, Affected Environment, which describes these important resources as well as other relevant features of the human environment.

2. *The impacts that are expected in that area from the proposed action* - The proposed action would modify king mackerel catch limits. The environmental consequences of the proposed action are analyzed in Sections 4.1.1, 4.1.2, 4.1.3, and 4.1.4, and are not expected to be significant. Reducing the total ACL may have positive effects on the on the physical environment, but these effects are not expected to be significant because the reduction in the ACL is not expected to alter the manner in which the king mackerel portion of the CMP fishery is prosecuted (Sections 4.1.1). It is expected to have positive effects on the biological environment because the action would reduce allowable harvest, which would allow the spawning stock biomass to increase (Section 4.1.2). Since king mackerel is often part of a multi-species fishing strategy and fishermen can specifically target them, even with decreased catch limits, bycatch mortality is expected to remain the same. Further, changing fishing practices on one stock does not generally change overall fishing effort or fishing practices so any impacts are not expected to be significant. This action is expected to have some positive effects on the social and economic environments for the commercial sector as the change to MRIP-FES increases the commercial sector catch limits (Sections 4.1.3 and 4.1.4). It is expected that the commercial sector will have positive impacts to both revenue and producer surplus in the short-term by the increased ACL. The increased commercial ACL may lead to a lengthened fishing season for commercial vessels harvesting king mackerel in the Gulf. This may result in some vessels may delay switching to harvest other species, until Gulf king mackerel is closed for the fishing year. While a short-term negative effect on the social and economic environment for the recreational sector may occur due to decrease in allowable harvest, the recreational sector has not reached its ACL in the past 20 years, nor is it projected to reach the reduced ACL (in MRIP-FES units). Therefore, in the short-term, the recreational sector is not expected to experience changes in its season length or resulting economic or social effects.

The action is not expected to significantly affect the administrative environment (Section 4.1.5), adversely or beneficially.

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

Other fishery related actions - Other pertinent actions are summarized in the history of management (Section 1.3). Currently, there are a few present actions and RFFAs that are being developed by the Councils or considered for implementation by NMFS that could affect CMP stocks. These include: Amendment 33, which proposes to revise Gulf king mackerel allocations; a Gulf generic framework, which would modify the Gulf Council's ABC Control Rule, a framework that would modify the Gulf commercial king mackerel gillnet seasonal closure; and a framework that would modify Gulf migratory group cobia sale provisions.[31] .

[31] http://gulfcouncil.org

Non-fishery related actions - Actions affecting the CMP fishery have been described in previous cumulative effect analyses (e.g., Amendment 26). Three important events include impacts of the *Deepwater Horizon* MC252 oil spill, the Northern Gulf Hypoxic Zone, and climate change (See Sections 3.1 and 3.2). Impacts from the *Deepwater Horizon* MC252 oil spill are still being examined; however, as indicated in Section 3.3.2, the oil spill had some adverse effects on fish species. Further, the impacts on the food web from phytoplankton, to zooplankton, to mollusks, to top predators may be significant in the future. Impacts to king mackerel from the oil spill may similarly affect other species that may be preyed upon by king mackerel. However, since the majority of the spawning biomass for king mackerel occurs outside the main areas affected by the *Deepwater Horizon* MC252 oil spill plume, it is less likely that a direct effect on either species will be detected. CMP fish species are mobile and are able to avoid hypoxic conditions, so any effects from the Northern Gulf Hypoxic Zone on CMP species are likely minimal.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. The Environmental Protection Agency's climate change web page provides basic background information on these and other measured or anticipated effects. In addition, the Intergovernmental Panel on Climate Change has numerous reports addressing their assessments of climate change.[32] Global climate changes could affect the Gulf fisheries as discussed in Section 3.2. In addition, the distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms. Climate change may significantly impact Gulf CMP species in the future, but the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts would occur. The proposed action is not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing, as this action should not change how the fishery is prosecuted. As described in Section 3.1, the contribution to greenhouse gas emissions from fishing is minor compared to other emission sources (e.g., oil platforms).

4. The impacts or expected impacts from these other actions - The cumulative effects associated with modifying king mackerel ACLs were analyzed in the EAs for Amendments 18 (GMFMC and SAFMC 2011) and 26 (GMFMC and SAFMC 2016), to the CMP FMP. In addition, cumulative effects related to broader CMP management have been recently analyzed in the EAs for Amendment 20B (GMFMC and SAFMC 2014), Amendment 26 (GMFMC and SAFMC 2016), and Amendment 31 (GMFMC and SAFMC 2018). These cumulative effects analyses are incorporated here by reference. They include detailed analysis of the CMP fishery, cumulative effects on non-target species, protected species, and habitats in the Gulf. Overall, bycatch of protected species in the king mackerel portion of the CMP fishery are negligible and effects to habitat are minimized due to the gear types used for harvest (Section 3.2). The effects of this action are positive, as they ultimately act to maintain the stocks at a level that will allow the maximum benefits in yield and increased fishing opportunities to be achieved. Some negative impacts on the social and economic environments may continue to occur despite the change to the ACL if in-season closures occur, which is more likely for the commercial sector. However, these effects would be reduced, compared to taking no action, as the ACL increase is expected to

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

allow harvest to continue later in the year before an in-season closure is triggered. Furthermore, it is assumed that fishing trips would occur regardless of whether king mackerel is open for harvest, as recreational fishing for king mackerel is generally part of a multi-species fishing strategy and commercial fishermen typically switch to targeting other species when king mackerel harvest is closed.

5. *The overall impact that can be expected if the individual impacts are allowed to accumulate:* This action, combined with other past actions, present actions, and RFFAs, is not expected to have significant beneficial or adverse effects on the physical and biological environments. Any effects are expected to be positive, but are not expected to substantially change the manner in which the CMP fishery is prosecuted (Sections 4.1.1 and 4.1.2). For the social and economic environments, some positive effects are expected to result for fishing communities from increasing the season length for the commercial sector due to increased catch limits (Sections 4.1.3 and 4.1.4). No effects are expected for the recreational sector as they are not expected to harvest their ACL and be subject to a closure under either alternative. Therefore, 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 physical, biological, economic, or social environments. Any effects of the proposed action, when combined with other past actions, present actions, and RFFAs are not expected to be significant. The effects of the proposed action are, and will continue to be, monitored through collection of landings data by NMFS, individual state programs, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. Landings data for the commercial sector in the Gulf are collected through trip ticket programs, port samplers, and logbook programs. Landings data for the recreational sector in the Gulf are collected through the Marine Recreational Information Program, Louisiana Creel Survey, Southeast Region Headboat Survey, and Texas Parks and Wildlife Department. The cumulative social and economic effects of past, present, and future amendments may be described as increasing fishing opportunities, resulting in positive social and economic impacts. The proposed action in this framework is expected to result in important long-term benefits to the commercial and for-hire fishing fleets, fishing communities and associated businesses, and private recreational anglers. This analysis found positive effects on the biophysical and socioeconomic environments because it would maintain the Gulf king mackerel stock at a level that allows the maximum benefits in yield while also allowing recruitment to increase.

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. This RIR analyzes the impacts this action would be expected to have on the Gulf of Mexico (Gulf) king mackerel fishery, which is included in the Coastal Migratory Pelagic (CMP) Resources of the Gulf of Mexico and Atlantic Region (CMP FMP).

5.2 Problems and Objectives

The problems and objectives addressed by this action are discussed in Section 1.2.

5.3 Description of Fisheries

A description of the king mackerel component of the Gulf CMP fishery is provided in Section 3.4.

5.4 Impacts of Management Measures

5.4.1 Action 1: Modify the Gulf of Mexico (Gulf) Migratory Group King Mackerel (Gulf King Mackerel) Overfishing Limit (OFL), Acceptable Biological Catch (ABC), and Annual Catch Limit (ACL)

A detailed analysis of the economic effects expected to result from this action is provided in Section 4.1.2. The following discussion analyzes the expected economic effects of the preferred alternative relative to the No Action alternative.

Under **Preferred Alternative 2**, the Gulf king mackerel commercial ACL would increase by 370,400 pounds (lbs) landed weight (lw) in the 2022/2023 fishing year and by 456,800 lbs lw in the 2023/2024 and subsequent fishing years. The average annual price per lb gw of Gulf king mackerel was $2.25 (2021 dollars). The associated estimated annual change in revenue would be $833,400 for the 2022/2023 fishing year and $1,027,800 for the 2023/2024 and subsequent fishing years. The commercial sector producer surplus (PS) is estimated as 30.7% of the ex-vessel value, resulting in an associated estimated annual change of $255,854 in the 2022/2023

fishing year and $315,535 for the 2023/2024 and subsequent fishing years. Over a ten-year timeframe of the 2022/2023 through 2031/2032 fishing years, the expected change in the net present value (NPV) of the commercial sector PS would be $2,712,641 using a 3% discount rate and $2,311,635 using a 7% discount rate. The consumer surplus (CS) for the commercial sector would be calculated using an own-price flexibility for the king mackerel commercial fishery to derive the expected average price change. However, information on own-price flexibility for the king mackerel commercial fishery, to our knowledge, does not currently exist, and therefore, CS for the commercial sector cannot be quantified.

Under **Preferred Alternative 2**, the Gulf king mackerel recreational sector ACL would decrease by 1,237,600 lbs lw in the 2022/2023 fishing year and by 1,054,000 lbs lw in the 2023/2024 and subsequent fishing years when comparing the status quo and proposed ACLs in MRIP-FES unit.. The CS value per fish for a second king mackerel kept is estimated at $111[33] (Carter and Liese 2012; values updated to 2021 dollars).[34] Estimated changes in economic value are approximated by multiplying the expected change in the number of fish harvested by this CS estimate. The expected change in the number of fish harvested is calculated by dividing the change in the recreational sector ACL by 8.795 lbs whole weight, which is the average weight of a recreationally landed king mackerel in the Gulf from the 2015/2016 to 2019/2020 fishing years.[35] Over a ten-year timeframe of 2022/2023 through 2031/2032 fishing years, the expected change in the NPV of the recreational sector CS would be -$119,190,228 using a 3% discount rate and -$102,284,986 using a 7% discount rate.

These expected changes in the NPV of the recreational CS assume that the recreational sector lands its ACL. However, the recreational sector has landed an average of 2,287,138 lbs lw (MRIP-CHTS) or 4,658,814 lbs lw (MRIP-FES) over the 2015/2016 to 2019/2020 fishing years, which are below the proposed ACLs (in MRIP-FES) in **Alternative 2**. As a result, in the short-term, the recreational sector is not expected to experience changes in its season length or resulting economic effects. Regarding the recreational sector's PS, the number of for-hire trips are not expected to be impacted, as there is no expected change in recreational season length. However, in the future, if season closures result due to the decreased recreational ACL, this may result in some level of trip cancellations and lost for-hire trip net revenue.

Net economic benefits from the commercial and recreational sectors combined from **Preferred Alternative 2**, relative to **Alternative 1**, would be expected to decrease by $15,363,306 in the 2022/2023 fishing year and by $12,986,497 in the 2023/2024 and subsequent fishing years; however, the reduction in net economic benefits would be less severe if the recreational sector

[33] This analysis uses a CS value per fish estimate for a second king mackerel kept. The first king mackerel kept would have a higher value for recreational fishermen than the second king mackerel, but an estimate for that is not available. Currently, the recreational sector has a bag limit of three king mackerel per person, however, the bag limit distribution for king mackerel landed in the Gulf shows that the majority of trips in the Gulf had recreational fishermen retaining 1 king mackerel per trip. Therefore, the economic value estimates for the recreational sector in this analysis would likely be a lower bound estimate.

[34] Converted to 2021 dollars using the annual, not seasonally adjusted Gross Domestic Product implicit price deflator provided by the U.S. Bureau of Economic Analysis.

[35] Data for average weights of a recreationally landed king mackerel in the Gulf were pooled from the Marine Recreational Information Program, Southeast Region Headboat Survey, Texas Parks and Wildlife recreational survey, and Louisiana Department of Wildlife and Fisheries creel survey.

continues to underharvest its ACL. The expected change in the discounted net present value of economic benefits to both sectors, over a ten-year timeframe of the 2022/2023 to 2031/2032 fishing years, would be -$116,477,587 using a 3% discount rate and -$99,973,351 using a 7% discount rate. As an average annual net present value, these expected changes would be -$11,647,759 and -$9,997,335 with a 3% and 7% discount rate, respectively.

5.5 Public and Private Costs of Regulations

The preparation, implementation, enforcement, and monitoring of this or any federal action involves the expenditure of public and private resources which can be expressed as costs associated with the regulations. Costs to the private sector are discussed in Section 5.4. Estimated public costs associated with this action include:

Council costs of document preparation, meetings, public hearings, and information dissemination……$16,319

NMFS administrative costs of document preparation, meetings and review ….....$20,906

TOTAL ….....$37,297

The estimate provided above does not include any law enforcement costs. Any enforcement duties associated with this action would be expected to be covered under routine enforcement costs rather than an expenditure of new funds. Council and NMFS administrative costs directly attributable to this amendment and the rulemaking process will be incurred prior to the effective date of the final rule implementing this amendment.

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 executive order (E.O). Based on the information in Sections 5.4-5.5, the costs and benefits resulting from this regulatory action are not expected to meet or exceed the $100 million threshold, and thus 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 of 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 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 various alternatives contained in the fishery management plan (FMP) or amendment (including framework management measures and other regulatory actions) and to ensure 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 an initial regulatory flexibility analysis (IRFA) for each proposed rule. The IRFA 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. An IRFA is primarily conducted to determine whether the proposed action would have a significant economic impact on a substantial number of small entities. The IRFA provides: 1) a description of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for, the proposed rule; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; 5) an identification, to the extent practicable, of all relevant federal rules, which may duplicate, overlap, or conflict with the proposed rule; 6) a description and estimate of the expected economic impacts on small entities; and 7) a description of the significant alternatives to the proposed rule and discussion of how the alternatives attempt to minimize economic impacts on small entities.

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

The need for and objective of this proposed action are provided in Chapter 1. In summary, there is a need to ensure catch limits are based on the best scientific information available, to prevent overfishing while achieving optimum yield, and to increase social and economic benefits for the king mackerel component of the Coastal Migratory Pelagics (CMP) fishery through sustainable harvest in accordance with provisions set forth in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The objective of this proposed action is to revise the catch limits for Gulf migratory group king mackerel (Gulf king mackerel) in response to new information on the stock provided in the Southeast Data, Assessment, and Review

(SEDAR) 38 Update stock assessment. The Magnuson-Stevens Act provides the statutory basis for this proposed action.

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

This proposed action, if implemented, would apply to all commercial vessels, charter vessels and headboats (for-hire vessels), and recreational anglers that fish for or harvest Gulf king mackerel, which occurs throughout the Gulf and off of Monroe County, Florida in the South Atlantic. The RFA does not consider recreational anglers to be small entities, so they are outside the scope of this analysis (5 U.S.C. 603). Small entities include small businesses, small organizations, and small governmental jurisdictions (5 U.S.C. 601(6) and 601(3)-(5)). Recreational anglers are not businesses, organizations, or governmental jurisdictions.

For-hire vessels sell fishing services to recreational anglers. The proposed changes to the Gulf migratory group king mackerel catch limits would not directly alter the services sold by these for-hire vessels. Any change in anglers' demand for these fishing services (and associated economic effects) as a result of the proposed action would be secondary to any direct effect on anglers and, therefore, would be an indirect effect of the proposed action. Indirect effects fall outside the scope of the RFA. However, for-hire captains and crew are allowed to sell Gulf king mackerel harvested under the bag limit when the commercial season is open, if they have both a Gulf Charter/Headboat for Coastal Migratory Pelagics permit (Gulf CMP for-hire permit) and a valid commercial king mackerel permit. Therefore, for-hire businesses, or employees thereof, could be directly affected by this proposed action as well.

During 2020, there were a total of 1,426 valid or renewable[36] commercial king mackerel permits and 17 valid or renewable king mackerel gillnet endorsements. On average from 2016 through 2020, there were 254 federally-permitted commercial vessels with reported landings of king mackerel in the Gulf. Their average annual vessel-level gross revenue from all species for 2016 through 2020 was approximately $93,426 (2021 dollars) and king mackerel harvested in the Gulf accounted for approximately 23% of this revenue. For commercial vessels that harvest Gulf king mackerel in the Gulf, it is estimated that economic profits are approximately 21.6% of annual gross revenue, on average. During the same period, there were 128 federally-permitted commercial vessels with reported landings of Gulf king mackerel in the South Atlantic. Their average annual vessel-level revenue from all species for 2016 through 2020 was approximately $40,035 (2021 dollars) and Gulf king mackerel harvested in the South Atlantic accounted for approximately 14% of this revenue. For commercial vessels that harvest Gulf king mackerel in the South Atlantic, it is estimated that economic profits are approximately 4.5% of annual gross revenue, on average. The maximum annual revenue from all species reported by a single one of the vessels that harvested Gulf king mackerel from 2016 through 2020 was approximately $2.44 million (2021 dollars).

[36] A renewable permit is an expired limited access permit that cannot be actively fished, but can be renewed for up to one year after expiration.

For anglers to fish for or possess CMP species in or from the Gulf exclusive economic zone (EEZ) on for-hire vessels, those vessels are required to have a limited access Gulf CMP for-hire permit. On February 1, 2022, there were 1,299 valid (non-expired) or renewable Gulf CMP for-hire permits and 4 valid or renewable Gulf CMP historical captain for-hire permits. For anglers to fish for or possess CMP species in or from the Mid-Atlantic or South Atlantic EEZ on for-hire vessels, those vessels are required to have an open access South Atlantic Charter/Headboat for Coastal Migratory Pelagic permit (South Atlantic CMP for-hire permit). On September 3, 2021, there were 1,825 valid South Atlantic CMP for-hire permits. Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, only federally permitted headboats are required to submit harvest and effort information to the National Marine Fisheries Service (NMFS) Southeast Region Headboat Survey (SRHS).[37] Participation in the SRHS is based on determination by the Southeast Fisheries Science Center (SEFSC) that the vessel primarily operates as a headboat. As of February 22, 2022, 69 Gulf headboats and 66 South Atlantic headboats were registered in the SRHS (K. Brennan, NMFS SEFSC, pers. comm. 2022). As a result, of the 1,303 vessels with Gulf CMP for-hire permits (including historical captain permits), up to 69 may primarily operate as headboats and the remainder as charter vessels. Of the 1,825 vessels with South Atlantic CMP for-hire permits, up to 66 may primarily operate as headboats.

The average charter vessel operating in the Gulf is estimated to receive approximately $94,000 (2021 dollars) in gross revenue and $28,000 in net income (gross revenue minus variable and fixed costs) annually. The average Gulf headboat is estimated to receive approximately $451,000 (2021 dollars) in gross revenue and $84,000 in net income annually. The average charter vessel operating in the South Atlantic is estimated to receive approximately $132,000 (2021 dollars) in annual gross revenue. The average South Atlantic headboat is expected to receive approximately $234,000 (2019 dollars) in annual gross revenue. Estimates of annual net income for South Atlantic charter vessels and headboats are not available.

For RFA purposes only, NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR § 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $11 million for all its affiliated operations worldwide. All of the commercial fishing businesses directly regulated by this proposed rule are believed to be small entities based on the NMFS size standard.

[37] As of January 5, 2021, the owners or operators of vessels issued federal charter/headboat permits are required to comply with the new Southeast For-Hire Electronic Reporting Program. Under this program, vessels with Gulf permits must declare trips prior to departure and submit electronic fishing reports prior to offloading fish, or within 30 minutes after the end of a trip, if no fish are landed. Vessels with South Atlantic permits must submit logbooks weekly, by 11:59 pm, local time, the Tuesday following a reporting week (Monday-Sunday). Those vessels selected to report to the SRHS (i.e., federally permitted headboats) continue to submit their reports under the new requirements directly to the SRHS program. For more information, see: https://www.fisheries.noaa.gov/southeast/recreational-fishing-data/southeast-hire-electronic-reporting-program?utm_medium=email&utm_source=govdelivery.

The Small Business Administration (SBA) has established size standards for all major industry sectors in the U.S. including for-hire businesses (NAICS code 487210). A business primarily involved in the for-hire fishing industry is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $8 million for all its affiliated operations worldwide. All of the for-hire vessels directly regulated by this action are believed to be small entities based on the SBA size criteria.

No other small entities that would be directly affected by this proposed action have been identified.

6.4 Description of the projected reporting, record-keeping and other compliance requirements of the proposed action, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for the preparation of the report or records

This proposed action would not establish any new reporting, record-keeping, or other compliance requirements.

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

No duplicative, overlapping, or conflicting federal rules have been identified.

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

Substantial number criterion

There are 1,426 federally permitted vessels eligible to commercially fish for or harvest Gulf king mackerel. However, it is expected that those vessels that historically landed Gulf king mackerel would be the most likely to be affected by the proposed action. From 2016 through 2020, there were approximately 363 federally permitted commercial vessels (Gulf and South Atlantic combined), on average, that harvested and sold Gulf king mackerel each year. Additionally, there are up to 3,124 vessels with a federal South Atlantic or Gulf CMP for-hire permit that could be affected by this proposed action.[38] Because all of these vessels are believed to be small entities, it is assumed that this action would affect a substantial number of small entities.

Significant economic impacts

[38] This is likely an overestimate because some vessels may hold permits for both sub-regions and thus be included in the counts for each.

The outcome of "significant economic impact" can be ascertained by examining two factors: disproportionality and profitability.

Disproportionality: Do the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities?

All entities likely to be affected by this action are believed to be small entities and thus the issue of disproportionality does not arise.

Profitability: Do the regulations significantly reduce profits for a substantial number of small entities?

A detailed analysis of the economic effects associated with this proposed action can be found in Chapter 4. The following information summarizes the expected effects of this proposed action.

This proposed action would modify the Gulf king mackerel overfishing limit, acceptable biological catch (ABC), and annual catch limit (ACL) as recommended by the Gulf Scientific and Statistical Committee for 2021/2022 – 2023/2024 and subsequent fishing years. The ACL would be set equal to the ABC or 9,720,000 pounds (lbs) landed weight (lw) in the 2022/2023 fishing year and then to 9,990,000 lbs lw in the 2023/2024 fishing year and thereafter. The commercial sub-ACL would be set equal to 3,110,400 lbs lw in the 2022/2023 fishing year and 3,196,800 lbs lw in the 2023/2024 fishing year and subsequent fishing years. The commercial sub-ACL is further divided into zone and gear specific quotas with 40% going to the Western Zone quota, 18% going to the Northern Zone quota, 21% going to the Southern Zone hook-and-line quota, and 21% going to the to the Southern Zone run-around gillnet quota. Overall, the proposed increase to the Gulf king mackerel commercial ACL, relative to the status quo commercial ACL of 2,740,000 lbs lw, would be 370,400 lbs lw in the 2022/2023 fishing year and 456,800 lbs lw in the 2023/2024 fishing year and subsequent years.

If commercial vessels harvest the full ACL proposed for 2022/2023, it would result in an aggregate increase in annual ex-vessel revenue of $833,400 (2021 dollars). The Western Zone would be expected to see an increase of $333,360 (2021 dollars) in ex-vessel revenue; the Northern Zone would be expected to see an increase of $150,012 in ex-vessel revenue; and the Southern Zone would be expected to see an increase of $350,028 in ex-vessel revenue, which would be split in half by hook-and-line vessels and gillnet vessels. On average from 2016 through 2020, there were approximately 363 federally permitted commercial vessels (Gulf and South Atlantic combined) that harvested and sold Gulf king mackerel each year. Assuming the potential aggregate increase in ex-vessel revenue from this proposed action is shared evenly by these vessels, it would result in a per-vessel increase in annual ex-vessel revenue of approximately $2,300 (2021 dollars) for the 2022/2023 fishing year. Individual vessels may experience varying levels of economic effects, depending on their fishing practices, operating characteristics, and profit maximization strategies.

In the 2023/2024 fishing year and subsequent years, the proposed increase, if harvested in full, would result in $1,027,800 in additional annual ex-vessel revenue (2021 dollars). The Western Zone would be expected to see an increase of $411,120 (2021 dollars) in ex-vessel revenue; the

Northern Zone would be expected to see an increase of $185,004 in ex-vessel revenue; and the Southern Zone would be expected to see an increase of $431,676 in ex-vessel revenue, which would be split in half across hook-and-line vessels and gillnet vessels. Assuming the potential increase in ex-vessel revenue from this proposed action is shared evenly by the 363 vessels that harvested Gulf king mackerel (on average from 2016 through 2020), it would result in a per-vessel increase in annual ex-vessel revenue of $2,800 (2021 dollars) during the 2023/2024 fishing year and subsequent years. Individual vessels may experience varying levels of economic effects, depending on their fishing practices, operating characteristics, and profit maximization strategies.

In summary, this proposed action would not be expected to have a significant economic impact on a substantial number of small entities.

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

This proposed action, if implemented, would not be expected to have a significant economic impact on a substantial number of small entities. As a result, the issue of significant alternatives is not relevant.

CHAPTER 7. LIST OF PREPARERS AND AGENCIES AND PERSONS CONSULTED

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

LIST OF AGENCIES CONSULTED

National Marine Fisheries Service
- Southeast Fisheries Science Center
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APPENDIX A. CHANGES TO RECREATIONAL DATA COLLECTION

Changes to the Recreational Data Collection Survey

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

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

MRIP also transitioned from the legacy Coastal Household Telephone Survey (CHTS) to a new mail survey (Fishing Effort Survey, FES) beginning in 2015, and in 2018, the FES replaced the CHTS. Both survey methods collect data needed to estimate marine recreational fishing effort (number of fishing trips) by shore and private/rental boat anglers on the Atlantic and Gulf coasts. The CHTS used random-digit dialing of homes in coastal counties to contact anglers. The new mail-based FES uses angler license and registration information as one way to identify and contact anglers (supplemented with data from the U.S. Postal Service, which includes virtually all U.S. households). Because the FES and CHTS are so different, NMFS conducted side-by side testing of the two methods from 2015 to 2018 and developed calibration procedures to convert the historical catch estimates (MRFSS, MRIP-CHTS, MRIP-APAIS [collectively MRFSS]) into MRIP-FES. In general, landings estimates are higher using the MRIP-FES as compared to the MRFSS estimates. This is because the FES is designed to more accurately measure fishing activity than the CHTS, not because there was a sudden rise in fishing effort. NMFS developed a calibration model to adjust historic effort estimates so that they can be accurately compared to new estimates from the FES. The new effort estimates alone do not lead to definitive conclusions about stock size or status in the past or at current. NMFS determined that the MRIP-FES data, when fully calibrated

to ensure comparability among years and across states, produced the best available data for use in stock assessments and management (NOAA Fisheries 2019). Table D1 reports Gulf king mackerel landings for 1986 through 2020 fishing years comparing MRIP-CHTS harvest data to MRIP-FES harvest data.

Table D1. Gulf king mackerel recreational (lbs ww) and commercial landings in pounds (lbs lw) using MRIP-CHTS and MRIP-FES units, and stock TAC/ACL in MRIP-CHTS by fishing year.

Fishing Year	Rec. Landings (CHTS)	Rec. Landings (FES)	Rec. ACL (CHTS)	Total Com. Landings	Com. ACL	Total Landings (CHTS)	Total Landings (FES)	Total stock TAC/ACL (CHTS)
1986/87	3,303,880	6,888,855		1,027,599		4,331,479	7,916,454	
1987/88	1,719,525	3,195,820		617,094		2,336,619	3,812,914	
1988/89	3,948,659	3,667,029		950,290		4,898,949	4,617,319	
1989/90	3,657,342	7,616,589		1,211,364		4,868,706	8,827,953	
1990/91	3,281,701	8,780,069		1,015,591		4,297,292	9,795,660	
1991/92	4,029,052	7,405,610		1,520,190		5,549,242	8,925,800	
1992/93	4,380,699	5,887,572		2,322,797		6,703,496	8,210,369	
1993/94	4,632,854	8,018,533		1,756,151		6,389,005	9,774,684	
1994/95	6,246,263	9,140,649		1,939,672		8,185,935	11,080,321	
1995/96	4,496,494	5,325,483		1,992,162		6,488,656	7,317,645	
1996/97	5,623,857	10,829,297		1,935,503		7,559,360	12,764,800	
1997/98	4,813,475	6,980,657		2,377,416		7,190,891	9,358,073	
1998/99	3,284,779	6,775,346		2,870,245		6,155,024	9,645,591	
1999/00	2,845,960	5,965,918		1,887,907		4,733,867	7,853,825	
2000/01	3,600,140	7,445,968		2,936,845		6,536,985	10,382,813	
2001/02	3,941,457	9,070,883	6,936,000	2,840,657	3,264,000	6,782,114	11,911,540	10,200,000
2002/03	2,983,798	6,169,130	6,936,000	3,032,207	3,264,000	6,016,005	9,201,337	10,200,000
2003/04	3,498,288	6,823,391	6,936,000	3,042,219	3,264,000	6,540,507	9,865,610	10,200,000
2004/05	2,564,642	5,339,214	6,936,000	3,140,596	3,264,000	5,705,238	8,479,810	10,200,000
2005/06	2,465,383	4,781,778	6,936,000	2,889,115	3,264,000	5,354,498	7,670,893	10,200,000
2006/07	3,319,495	6,074,882	7,344,000	3,121,321	3,456,000	6,440,816	9,196,203	10,800,000
2007/08	2,464,224	4,871,760	7,344,000	3,357,297	3,456,000	5,821,521	8,229,057	10,800,000
2008/09	2,790,428	5,168,997	7,344,000	3,913,176	3,456,000	6,703,604	9,082,173	10,800,000
2009/10	3,261,388	7,939,505	7,344,000	3,706,798	3,456,000	6,968,186	11,646,303	10,800,000
2010/11	1,993,088	5,497,642	7,344,000	3,473,388	3,456,000	5,466,476	8,971,030	10,800,000
2011/12	2,012,068	5,060,923	7,344,000	3,374,877	3,456,000	5,386,945	8,435,800	10,800,000
2012/13	3,224,351	6,856,317	7,344,000	3,501,893	3,456,000	6,726,244	10,358,210	10,800,000
2013/14	2,082,852	3,948,649	7,344,000	3,236,234	3,456,000	5,319,086	7,184,883	10,800,000
2014/15	4,015,683	7,777,977	7,344,000	3,753,959	3,456,000	7,769,642	11,531,936	10,800,000
2015/16	2,531,260	4,812,866	7,344,000	3,642,992	3,456,000	6,174,252	8,455,858	10,800,000
2016/17	2,587,187	4,986,684	6,260,000	2,902,360	2,950,000	5,489,547	7,889,044	9,210,000
2017/18	2,356,343	5,210,721	6,040,000	3,031,397	2,840,000	5,387,740	8,242,118	8,880,000
2018/19	2,338,564	5,044,834	5,920,000	2,780,813	2,790,000	5,119,377	7,825,647	8,710,000
2019/20	1,622,334	3,238,966	5,810,000	2,658,942	2,740,000	4,281,276	5,897,908	8,550,000

[1]Commercial allocation = 32% [2]Recreational allocation = 68%

Source: SEFSC Commercial ACL data (August 9, 2021). Recreational SEFSC Recreational ACL data (Accessed May 10, 2021 [CHTS] and May 11, 2021 [FES]).

Note: The Gulf king mackerel fishing year for the recreational sector and commercial sector Western and Southern Zone is July 1 – June 30. The fishing year for the commercial sector Northern Zone is October 1 – September 30. The total ACL was reduced in the 2016/17 fishing year due to the results of SEDAR 38 (2014) and the mixing zone changing with fish being reallocated to the Atlantic king mackerel migratory group that were previously allotted to the Gulf king mackerel migratory group.

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APPENDIX B. GULF KING MACKEREL ABC PROJECTIONS ANALYSIS

Southeast Fisheries Science Center, Sustainable Fisheries Division

Addressing the request made by John Froeschke, Gulf of Mexico Fisheries Management Council March 16, 2021

Disclaimer: The results presented in this work are intended for within model comparisons only and not the purposes of management advice of any kind.

The SEFSC was requested to communicate to the GMFMC a comparison of the Gulf of Mexico King Mackerel stock assessment models towards helping to understand the effects of various changes. Changes were made to the recreational catch/discard data (CHTS vs. FES) and shrimp bycatch (2013 estimate vs. 2020 estimate). These changes represented the "best available data" at the time of the SEDAR 38U assessment. The requests made are given Appendix 1 and Appendix 2.

Four models were configured to address this request. Each model isolates a particular model and/or data set in order to evaluate the effect of each change (Table 1).

Model_1. Baseline model. The SEDAR 38 model used for management advice:

- Use the original SEDAR 38 projection and the resulting OFL and ABC through FY2027.

Model_2. To evaluate any changes due only to the switch from CHTS to FES data:

- Use the SEDAR 38U model, truncated to 2012
- Replace the SEDAR 38 headboat landings/discards series with that used in SEDAR 38U
- Replace the SEDAR 38 CHTS series with the SEDAR 38U FES series
- Retain the SEDAR 38 shrimp bycatch estimate
- Project exactly as was done for the original SEDAR 38 model.

Model_3. To evaluate the effect of the new data inputs (FES and shrimp bycatch, combined) while retaining the old terminal year:

- Use the SEDAR 38U model, truncated to 2012
- Use the FES series and the updated SEDAR 38U shrimp estimate.
- Project exactly as you did for the original SEDAR38 model.

Model_4. To evaluate the effect of the new data series and population change since 2012.

- Use the accepted projections from SEDAR 38U

The same P* value (0.43) used in both SEDAR 38 and 38U was applied to the OFL to calculate ABC. The resulting retained yield (mt) with 10% and 90% confidence intervals, Over Fishing Limit (OFL) and Allowable Biological Catch (ABC) resulting from the four model configurations shown in Table 2.

Model_2 projections for 2015-2027 resulted in an average ABC of 12.08 mp vs. 7.96 mp for the baseline model, an average annual difference of 52% (Table 3). This comparison reflects changes in the ABC due to changing from CHTS to FES landings/discards time series. Trends in the projections are shown in Figure 1. Similar to Model_1, Model_2 projections show a near term increase in ABC with a gradual decrease over the years. The shapes of the projection trends are very similar however they differ by a scaling factor that changes over time.

Model_3 projections for 2015-2027 resulted in an average ABC of 11.57 mp vs 7.96 for the baseline model, an average difference across years of 46% (Table 3). This comparison reflects changes due to both the migration from CHTS to FES time series, as well as the changes in the shrimp fishery bycatch. The changes in the projection due to using the new shrimp fishery bycatch resulted in the stock assessment model estimating a larger starting population size to account for the increase mortality of juveniles.

Model_4 (the model that was used to provide SEDAR 38U management advice) resulted in an average ABC of 10.81 mp vs. 7.96 for the baseline model, a difference of 40% (Table 3). This difference reflects all changes in the data (i.e. FES and shrimp fishery bycatch) as well as the updates in the length compositions and CPUE time series that changed the model terminal year from 2012 to 2017. These updated data, specifically the headboat CPUE, resulted in reduced estimates of the most recent recruitment (Figures 1 and 2).

Table 1. Data and model combinations used to configuration the four King Mackerel models used for comparisons.

DATA / Model Used	Model 1	Model 2	Model 3	Model 4
Terminal Year	2012	2012	2012	2017
SEDAR 38	X			
SEDAR 38U		X	X	X
CHTS	X			
FES		X	X	X
Shimp 2012	X	X		
Shrimp 2020			X	X

Table 2. Retained yield (mt) with 10% and 90% confidence intervals, Over Fishing Limit (OFL) and Allowable Biological Catch (ABC) resulting from the four model configurations shown in Table 1

Model 1 Model 2

P* = 0.43 YEAR	LCI	Retained Yield (mt)	UCI	ABC in MT	OFL (million lbs)	ABC (million lbs)
2015	3520	4261	5001	4159	9.39	9.17
2016	3229	4087	4945	3969	9.01	8.75
2017	3038	3956	4873	3830	8.72	8.44
2018	2908	3851	4794	3721	8.49	8.20
2019	2814	3767	4721	3636	8.31	8.02
2020	2744	3702	4660	3570	8.16	7.87
2021	2690	3651	4611	3519	8.05	7.76
2022	2650	3612	4573	3479	7.96	7.67
2023	2620	3581	4543	3449	7.90	7.60
2024	2597	3558	4520	3426	7.84	7.55
2025	2579	3541	4502	3408	7.81	7.51
2026	2566	3527	4488	3395	7.78	7.48

P* = 0.43 YEAR	LCI	Retained Yield (mt)	UCI	ABC in MT	OFL (million lbs)	ABC (million lbs)
2015	5550	6774	7998	6605	14.93	14.56
2016	5040	6396	7752	6209	14.10	13.69
2017	4690	6106	7522	5911	13.46	13.03
2018	4446	5884	7321	5686	12.97	12.53
2019	4269	5713	7158	5514	12.60	12.16
2020	4137	5583	7030	5384	12.31	11.87
2021	4038	5485	6931	5286	12.09	11.65
2022	3965	5410	6856	5211	11.93	11.49
2023	3909	5354	6798	5155	11.80	11.36
2024	3867	5311	6754	5112	11.71	11.27
2025	3835	5278	6721	5079	11.64	11.20
2026	3811	5253	6695	5055	11.58	11.14

Model 3

P* = 0.43 YEAR	LCI	Retained Yield (mt)	UCI	ABC in MT	OFL (million lbs)	ABC (million lbs)
2015	4445	5512	6579	5365	12.15	11.83
2016	4234	5458	6682	5290	12.03	11.66
2017	4120	5432	6743	5251	11.97	11.58
2018	4060	5421	6782	5234	11.95	11.54
2019	4030	5425	6820	5233	11.96	11.54
2020	4013	5431	6849	5236	11.97	11.54
2021	4002	5433	6865	5236	11.98	11.54
2022	3994	5432	6870	5234	11.98	11.54
2023	3988	5429	6871	5231	11.97	11.53
2024	3983	5427	6870	5228	11.96	11.53
2025	3980	5424	6869	5226	11.96	11.52
2026	3977	5422	6868	5224	11.95	11.52
2027	3976	5421	6866	5222	11.95	11.51

Model 4

P* = 0.43 YEAR	LCI	Retained Yield (mt)	UCI	ABC in MT	OFL (million lbs)	ABC (million lbs)
2018		5196				
2019		5096				
2020		5104				
2021	3559	4941	6323	4751	10.89	10.47
2022	3523	5014	6504	4809	11.05	10.60
2023	3524	5070	6617	4857	11.18	10.71
2024	3535	5111	6687	4894	11.27	10.79
2025	3548	5141	6733	4921	11.33	10.85
2026	3560	5162	6765	4942	11.38	10.89
2027	3569	5178	6786	4956	11.41	10.93
2028	3577	5189	6801	4967	11.44	10.95
2029	3584	5198	6812	4976	11.46	10.97
2030	3589	5204	6820	4982	11.47	10.98

Table 3. Allowable Biological Catch (ABC) and percent difference from the SEDAR 38 resulting from the four model configurations shown in Table 1 above.

YEAR	Model 1 ABC (million lbs)	Model 2 ABC (million lbs)	Model 3 ABC (million lbs)	Model 4 ABC (million lbs)	Model 1 % Diff from SEDAR 38	Model 2 % Diff from SEDAR 38	Model 3 % Diff from SEDAR 38	Model 4 % Diff from SEDAR 38
2015	9.17	14.56	11.83		0%	59%	29%	
2016	8.75	13.69	11.66		0%	56%	33%	
2017	8.44	13.03	11.58		0%	54%	37%	
2018	8.20	12.53	11.54	10.47	0%	53%	41%	28%
2019	8.02	12.16	11.54	10.60	0%	52%	44%	32%
2020	7.87	11.87	11.54	10.71	0%	51%	47%	36%
2021	7.76	11.65	11.54	10.79	0%	50%	49%	39%
2022	7.67	11.49	11.54	10.85	0%	50%	50%	41%
2023	7.60	11.36	11.53	10.89	0%	49%	52%	43%
2024	7.55	11.27	11.53	10.93	0%	49%	53%	45%
2025	7.51	11.20	11.52	10.95	0%	49%	53%	46%
2026	7.48	11.14	11.52	10.97	0%	49%	54%	47%
2027	7.46	11.10	11.51	10.98	0%	49%	54%	47%
Average	7.96	12.08	11.57	10.81	0%	52%	46%	40%

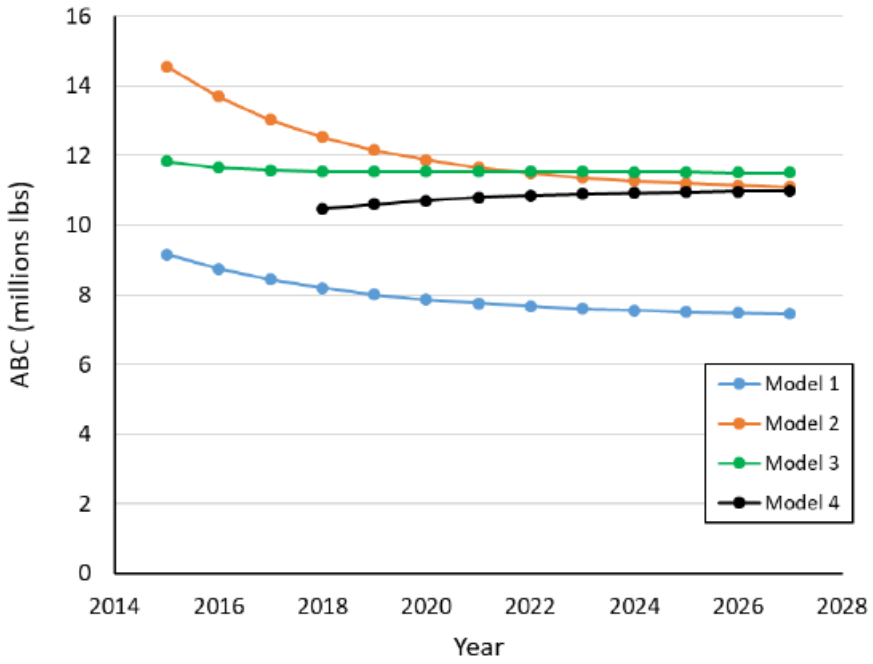

Figure 1. ABC projections for Gulf of Mexico King Mackerel from the four-model configuration considered in this study.

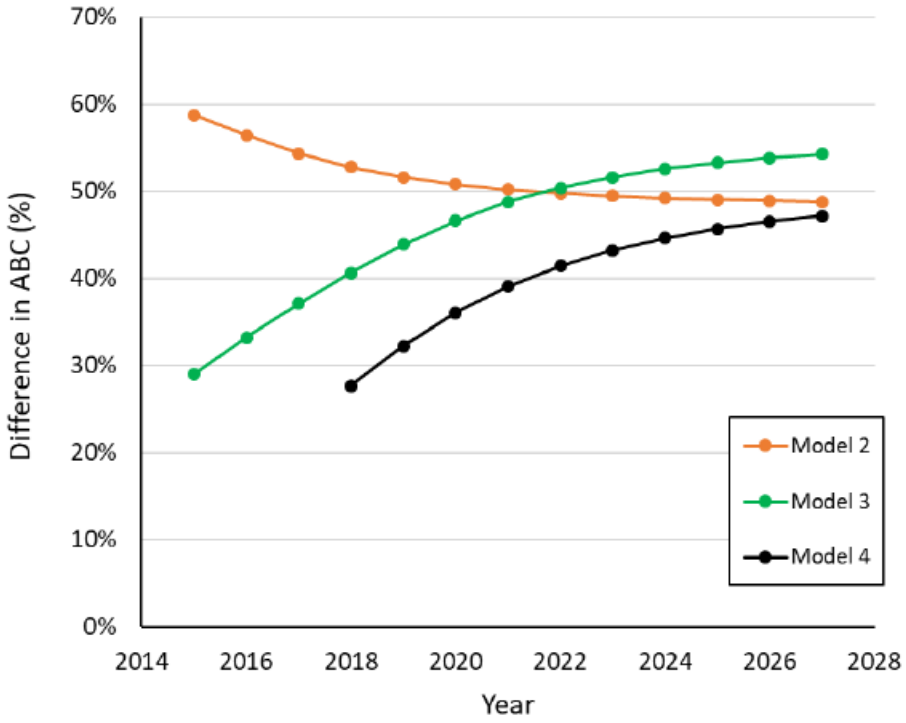

Figure 2. Percent differences between the baseline model (SEDAR 38) ABC projections and the ABCs for the three other model configurations considered in this study for Gulf of Mexico King Mackerel from.

Appendix 1

Gulf of Mexico Fishery Management Council

Managing Fishery Resources in the U.S. Federal Waters of the Gulf of Mexico

4107 W. Spruce Street, Suite 200, Tampa, Florida 33607 USA
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006888NOV2020

MEMORANDUM

DATE: November 6, 2020

TO: Dr. Clay Porch, SEFSC Science and Research Director
FROM: Dr. John Froeschke, Deputy Director
RE: King Mackerel Acceptable Biological Catch (ABC) conversion from historical data

During the October 2020 meeting, the Council reviewed the results of the recently completed Gulf king mackerel SEDAR 38 update stock assessment. As part of their deliberation, the Council has requested additional information that may be necessary to modify catch levels and sector allocations based on the use of Marine Recreational Information Program (MRIP)-Fishing Effort Survey (FES) data in the most recent stock assessment. Specifically, the Council is requesting an analysis that would re-estimate the overfishing limit (OFL) and ABC for the fishing years from 2016/2017 through the 2019/2020. The OFL and ABC recommendations that resulted from SEDAR 38 were originally based on MRIP-Coastal Household Telephone Survey (CHTS) recreational data while the SEDAR 38U assessment uses MRIP-FES data. The requested analysis would use MRIP-FES recreational data in the SEDAR 38 assessment to generate the harvest advice in the MRIP-FES currency. No other modifications to the SEDAR 38 model are requested. I have discussed this requested previously with your staff and they have indicated this work could be completed within approximately two weeks (November 20, 2020).

Please contact me directly if you have any concerns.

cc: John Walter, Ph.D., Shannon Cass-Calay, Ph.D., Craig Brown, Ph.D., Michael Schirripa, Ph.D., Natasha Mendez-Ferrer, Ph.D., Carrie Simmons, Ph.D., Peter Hood

Appendix 2

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service Southeast Fisheries Science Center 75 Virginia Beach Drive
Miami, Florida 33149 U.S.A.
(305) 361-4200 Fax: (305) 361-4499

006891NOV2020
November 20, 2020

Dr. Carrie M. Simmons, Ph.D.,
Executive Director
Gulf of Mexico Fishery Management Council
4107 W. Spruce Street, Suite 200
Tampa, Florida 36607

Dear Dr. Simmons:

During the October 2020 meeting of the Gulf of Mexico Fisheries Management Council (the Council), the Council reviewed the report of the SSC meeting (Standing, Reef Fish, Mackerel, Ecosystem, and Socioeconomic SSC Webinar Meeting Summary, September 14, 2020) and the recently completed Gulf King Mackerel SEDAR 38U update stock assessment. On November 6, 2020, the Council requested additional information to facilitate comparisons between catch levels and sector allocations based on the use of MRIP-Coastal Household Telephone Survey (MRIP-CHTS) and MRIP-Fishing Effort Survey (MRIP-FES) data in the King Mackerel stock assessment. Specifically, the Council requested an analysis that would re-estimate the overfishing limit (OFL), acceptable biological catch (ABC) and annual catch limit (ACL) for the fishing years from 2016/2017 through 2019/2020. To accomplish this request, the Center was directed to:

Replace the MRIP-CHTS landings and discard estimates in the SEDAR 38 (2014) base model with estimates derived from MRIP-FES in order to generate management advice in MRIP-FES currency. Compare the original OFL, ABC and ACL in MRIP-CHTS currency to the revised estimates in MRIP-FES currency.

To facilitate comparison, the Council requested no further modifications to the SEDAR 38 base model. The Center attempted the work outlined above but discovered that a simple replacement of the recreational time series resulted in a model that did not converge and produced unstable results. This is always a potential problem when making substantive changes to input data. Attempts to stabilize this particular model required changes that make invalidated the desired comparisons (i.e. between catch levels and sector allocations based on the use of MRIP-CHTS and MRIP-FES data). For this reason, the Center was not able to produce useful results using the methods outlined above. Although other approaches are possible, they require additional consideration as

to how to best proceed. The Center is willing to continue to work with Council staff to address this issue.

Sincerely,

John F. Walter, III
Deputy Director for Science and Council Services

cc: Clay Porch, Shannon Cass-Calay, Michael Schirripa, Peter Hood, John Froeschke Craig Brown Larry Massey

APPENDIX C. OTHER APPLICABLE LAWS

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for management of stocks included in fishery management plans (FMP) in federal waters of the exclusive economic zone. However, management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems that support those fisheries. Major laws affecting federal fishery management decision-making include the Endangered Species Act (Section 3.3.3), E.O. 12866 (Regulatory Planning and Review, Chapter 5) and E.O. 12898 (Environmental Justice, Section 3.5). Other applicable laws are summarized below.

Administrative Procedure Act

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

Coastal Zone Management Act

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

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

Data Quality Act

The Data Quality Act (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by

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

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

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

National Historic Preservation Act

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

Historical research indicates that over 2,000 ships have sunk on the Federal Outer Continental Shelf between 1625 and 1951; thousands more have sunk closer to shore in state waters during the same period. Only a handful of these have been scientifically excavated by archaeologists for the benefit of generations to come.[39]

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

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

they alter any regulations intended to protect them.

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

Executive Orders (E.O.)

E.O. 12630: Takings

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

E.O. 12962: Recreational Fisheries

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

E.O. 13089: Coral Reef Protection

The E.O. on Coral Reef Protection requires federal agencies whose actions may affect U.S. coral reef ecosystems to identify those actions, utilize their programs and authorities to protect and enhance the conditions of such ecosystems, and, to the extent permitted by law, ensure actions that they authorize, fund, or carry out do not degrade the condition of that ecosystem. By

definition, a U.S. coral reef ecosystem means those species, habitats, and other national resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., federal, state, territorial, or commonwealth waters).

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

E.O. 13132: Federalism

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

No Federalism issues were identified relative to the king mackerel action. Therefore, consultation with state officials under Executive Order 12612 was not necessary. Consequently, consultation with state officials under Executive Order 12612 remains unnecessary.

E.O. 13158: Marine Protected Areas

This E.O. requires federal agencies to consider whether their proposed action(s) will affect any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural or cultural resource within the protected area. There are several marine protected areas, HAPCs, and gear-restricted areas in the eastern and northwestern Gulf. The existing areas are entirely within federal waters of the Gulf. They do not affect any areas reserved by federal, state, territorial, tribal or local jurisdictions.

APPENDIX D. PUBLIC COMMENTS RECEIVED

The Gulf of Mexico Fishery Management Council's Coastal Migratory Pelagics Advisory Panel (AP) was convened on July 22, 2021, and discussed the actionin this framework amendment. The AP ultimately passed the following two recommendations to the Council:

Motion: To recommend that the Council adopt Alternative 2 in Action 1 as the preferred alternative.

Alternative 2: Revise the OFL and ABC for Gulf king mackerel as recommended by the Gulf SSC for 2021/2022 – 2023/2024 and subsequent fishing years. Retain the total ACL being set equal to the ABC; an annual catch target (ACT) is not used.

Fishing Year	OFL	ABC	Total ACL
2021/2022	10.89	9.37	9.37
2022/2023	11.05	9.72	9.72
2023/2024+	11.18	9.99	9.99

Catch limit values are in mp lw
Note: OFL and ABC as recommended by the Gulf SSC in mp ww. The recreational portion of the OFL, ABC, and ACL are based on MRIP-FES data.

Motion carried unanimously.

Public Comments Received: