3/14/2022
Tab C, No. 5

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

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

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

April 2022

This is a publication of the Gulf of Mexico Fishery Management Council Pursuant to National Oceanic and Atmospheric Administration Award No. NA15NMF4410011.

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ENVIRONMENTAL ASSESSMENT COVER SHEET

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

Type of Action

( ) Administrative
(X) Draft
( ) Legislative
( ) Final

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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
LW	landed weight
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

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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 (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). Amendment 33 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 (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.

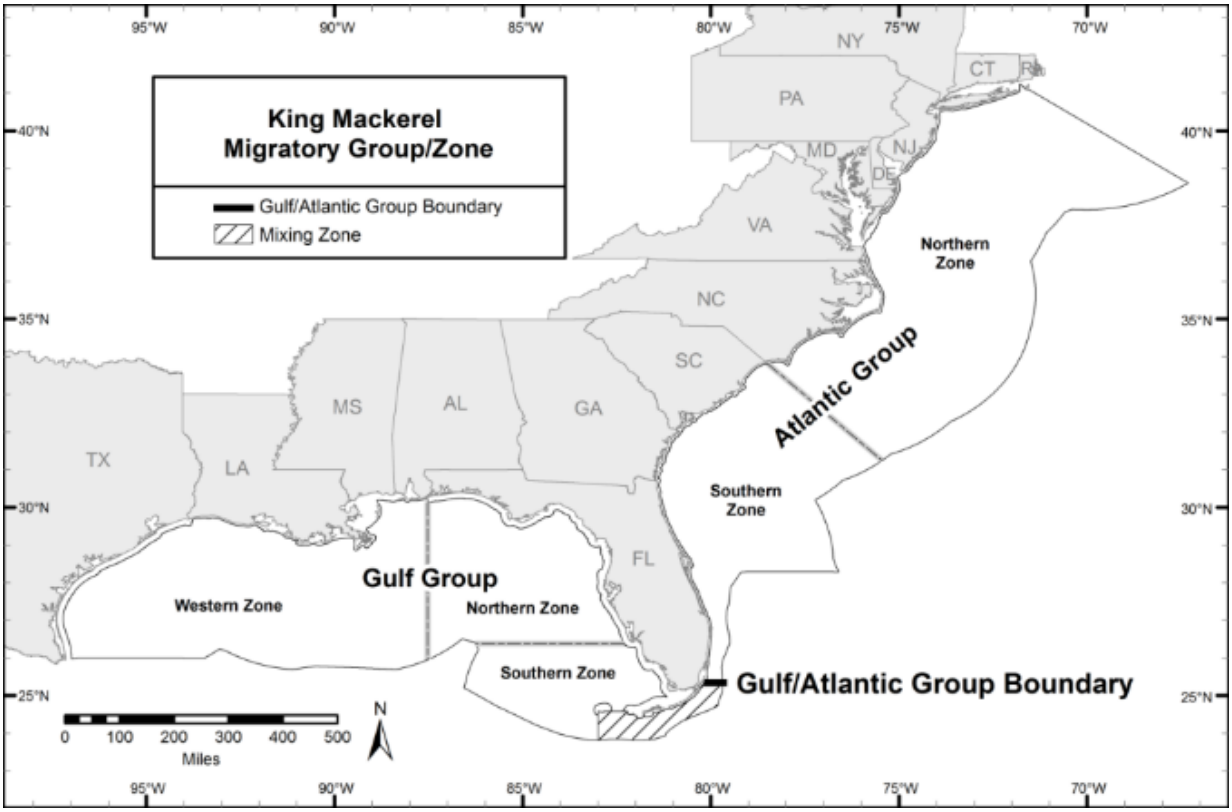

Figure 1.1.1. Gulf and Atlantic king mackerel stock boundaries as currently used for management purposes by the Councils. The Gulf is divided into commercial management Zones, which are managed by the Gulf Council, and includes the mixing zone (hashed area). The South Atlantic Council management area 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.

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 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 and 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 Council is not currently considering modifying commercial zone allocations.

Gulf King Mackerel Landings

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 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.

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 the current level of 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 occurring 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}) = $SSB_{SPR30\%}$ (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. Gulf Council SSC members were uncomfortable with the narrow buffer between the OFL and ABC that was produced using the probability density functions (PDFs) in the projections. 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 16% 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
2021/2022	10,890,000	9,370,000
2022/2023	11,050,000	9,720,000
2023/2024+	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 to consider modifications to the allocations between the commercial and recreational fishing sectors. 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 Council does not expect the change from MRIP-CHTS to MRIP-FES to impact recreational fishing opportunities.

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 2016) and are incorporated here by reference. A complete history of management for CMP species is provided on the Gulf Council website.[1] 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

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

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.

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
2019/2020+	8.95	8.55	8.55
2019/2020+ MRIP-FES equivalent	12.60	12.16	12.16

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.

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.

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) 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 fishing years using Marine Recreational Information Program's (MRIP) Fishing Effort Survey (FES) units. A buffer between the OFL and the ABC remains due to scientific uncertainty, and was fixed at 85% of the fishing mortality rate (F) at 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 85% of $F_{SPR30\%}$). This value also corresponds to the definition of optimum yield (OY) for Gulf king mackerel. Amendment 18 to the CMP FMP defined the ACL as equal to ABC (GMFMC and SAFMC 2011) and Amendment 26 to the CMP FMP retained this definition (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 herein, 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 C). 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 the third model iteration 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 Update (2020) model performance by 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 38U ABC (lbs ww) MRIP-CHTS	M3 - S38U (lbs ww) MRIP-CHTS	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 sector-specific ACLs under **Alternative 2** is demonstrated in Table 2.1.3. Commercial 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. 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 2.1.3. Catch limits for Gulf king mackerel for Alternative 2 in Action 1 based on current allocation of 68% recreational and 32% commercial compared to 2021/2022 fishing year MRIP-FES equivalent for Alternative 1. Catch limits are expressed as lbs lw for both fishing sectors and all commercial zones. The current fishing year catch limits are provided for comparison only. The recreational portion of the catch limits are in MRIP-FES units. Slight differences in totals relate to the difference in the number of significant figures used between SSC recommendations and the codified regulations.

Fishing Year	OFL	ABC	Total ACL	Rec ACL	Comm ACL
Current 2021/2022 (MRIP-FES equiv.)	12,600,000	12,160,000	12,160,000	8,268,800	3,891,200
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

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 2021/2022 fishing year MRIP-FES equivalent for 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 2021/2022 (MRIP-FES equiv.)	3,891,200	1,556,480	700,416	817,152	3,074,048	817,152
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. REFERENCES

Arendt, M. D., J. E. Olney, and J. A. Lucy, 2001. Stomach content analysis of cobia, Rachycentron canadum, from lower Chesapeake Bay. Fishery Bulletin-National Oceanic and Atmospheric Administration 99(4): 665-670.

Carter, D.W. and C. Liese. 2012. The Economic Value of Catching and Keeping or Releasing Saltwater Sport Fish in the Southeast USA. North American Journal of Fisheries Management, 32:4, 613-625. Available at: http://dx.doi.org/10.1080/02755947.2012.675943

Ditty, J. G., and R. F. Shaw. 1992. Larval development, distribution, and ecology of cobia, *Rachycentron canadum*, (Family: Rachycentridae) in the northern Gulf of Mexico. Fishery Bulletin 90:668–677.

Franks, J. S., N. M. Garber, and J. R. Warren. 1996. Stomach contents of juvenile cobia, *Rachycentron canadum*, from the northern Gulf of Mexico. Fishery Bulletin 94:374-380.

Fry, G. C., and S. P. Griffiths. 2010. Population dynamics and stock status of cobia, *Rachycentron canadum*, caught in Australian recreational and commercial coastal fisheries. Fisheries Management and Ecology 17(3):231-239.

GMFMC and SAFMC. 1983. Fishery management plan final environmental impact statement regulatory impact review final regulations for the coastal migratory pelagic resources (mackerels). Gulf of Mexico Fishery Management Council, Tampa, Florida, and South Atlantic Fishery Management Council, Charleston, South Carolina. 340 pp. http://gulfcouncil.org/wp-content/uploads/MAC-FMP-Final-EIS-1983-02.pdf

GMFMC and SAFMC. 1990. Amendment number 5 to the fishery management plan for the coastal migratory pelagic resources (mackerels). Includes environmental assessment and regulatory impact review. Gulf of Mexico Fishery Management Council, Tampa, Florida, and South Atlantic Fishery Management Council, Charleston, South Carolina. 44 pp. http://gulfcouncil.org/wp-content/uploads/MAC-Amend-05-Final-1990-03-2.pdf

GMFMC and SAFMC. 2011. Final Amendment 18 to the fishery management plan for coastal migratory pelagic resources in the Gulf of Mexico and Atlantic regions including environmental assessment, regulatory impact review, and regulatory flexibility analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida, and South Atlantic Fishery Management Council, Charleston, South Carolina. 399 pp. http://gulfcouncil.org/wp-content/uploads/Final-CMP-Amendment-18-092311-w-o-appendices-1.pdf

GMFMC and SAFMC. 2014. Modifications to the coastal migratory pelagics zone management. Final Amendment 20B to the fishery management plan for coastal migratory pelagic resources in the Gulf of Mexico and South Atlantic region including environmental assessment, fishery impact statement, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida, and South Atlantic Fishery Management

Council, North Charleston, South Carolina. 258 pp. http://gulfcouncil.org/wp-content/uploads/CMP-Amendment-20B.pdf

GMFMC and SAFMC. 2018. Atlantic Migratory Group Cobia Management. Final Amendment 31 to the fishery management plan for coastal migratory pelagic resources in the Gulf of Mexico and South Atlantic region including environmental assessment, fishery impact statement, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida, and South Atlantic Fishery Management Council, North Charleston, South Carolina. 209 pp. http://gulfcouncil.org/wp-content/uploads/CMP_Amendment31_FINAL_July2018.pdf

Jacob, Steve, Priscilla Weeks, Ben Blount, and Michael Jepson. 2013. Development and evaluation of social indicators of vulnerability and resiliency for fishing communities in the Gulf of Mexico. Marine Policy 37:86-95.

Jepson, Michael and Lisa L. Colburn. 2013. Development of Social Indicators of Fishing Community Vulnerability and Resilience in the U.S. Southeast and Northeast Regions. U.S. Dept. of Commerce., NOAA Technical Memorandum NMFS-F/SPO-129, 64 p.

Lotz, J. M., R. M. Overstreet, and J. S. Franks. 1996. Gonadal maturation in the cobia, *Rachycentron canadum*, from the northcentral Gulf of Mexico. Gulf Resources Reports 9:147–159.

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

NMFS. 2017. Fisheries Economics of the United States, 2015. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-170, 247p.

Savolainen, M.A., R.H. Caffey, and R.F. Kazmierczak, Jr. 2012. Economic and attitudinal perspectives of the recreational for-hire fishing industry in the U.S. Gulf of Mexico. Center for Natural Resource Economics and Policy, LSU AgCenter and Louisiana Sea Grant College Program, Department of Agricultural Economics and Agribusiness, Louisiana State University, Baton Rouge, LA. 171 p. www.laseagrant.org/wp-content/uploads/Gulf-RFH-Survey-Final-Report-2012.pdf

SEDAR 28. 2013. Gulf of Mexico cobia stock assessment report. Southeast Data, Assessment, and Review. North Charleston, South Carolina. 616 pp. http://sedarweb.org/docs/sar/S28_SAR_GoM.Cobia_4.29.2013.pdf

SEDAR. 2018. SEDAR 58 Cobia Stock ID Workshop Report. Southeast Data, Assessment, and Review. North Charleston, South Carolina. 74 pp. http://sedarweb.org/docs/page/S58_CobiaStckIDReport_5.21.2018_FINAL_watermark.pdf

Vondruska, J. 2010. Fishery analysis of the commercial fisheries for eleven coastal migratory pelagic species. SERO-FSSB-2010-01. National Marine Fisheries Service, Southeast Regional Office. St. Petersburg, Florida.

APPENDIX A. 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 NOAA regulations at 15 CFR part 930, subpart C. According to these regulations and CZMA Section 307(c)(1), when taking an action that affects any land or water use or natural resource of a state's coastal zone, NMFS is required to provide a consistency determination to the relevant state agency at least 90 days before taking final action.

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

Data Quality Act

The Data Quality Act (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or

audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

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

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

National Historic Preservation Act

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

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

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

Executive Orders (E.O.)

E.O. 12630: Takings

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

E.O. 13089: Coral Reef Protection

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

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

E.O. 13132: Federalism

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

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

E.O. 13158: Marine Protected Areas

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

APPENDIX B. 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 action in 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:

APPENDIX C. 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

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

Model 2

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%

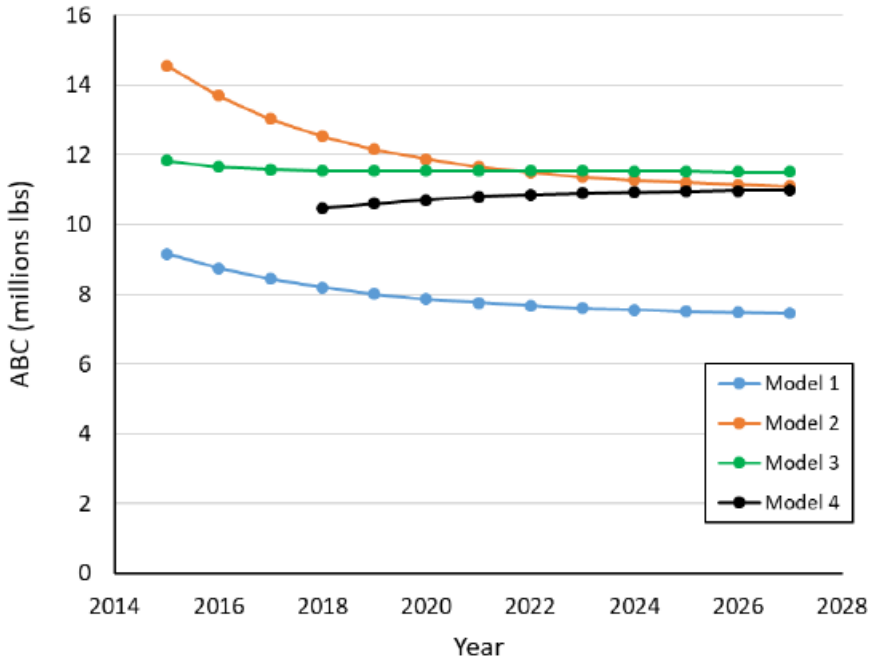

Figure 1. ABC projections for Gulf of Mexico King Mackerel from the four-model configuration considered in this study.

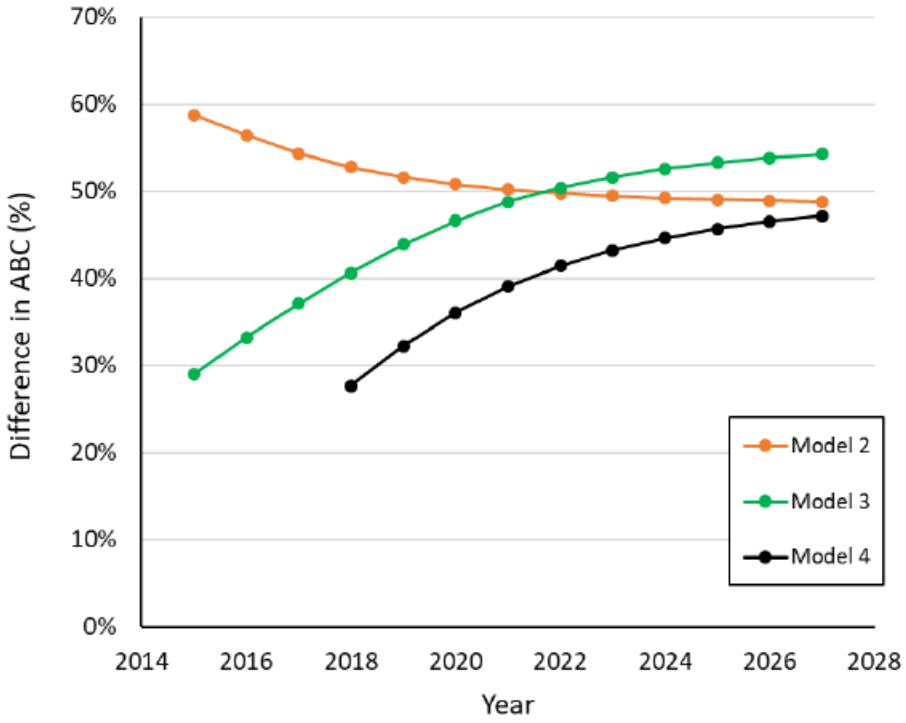

Figure 2. Percent differences between the baseline model (SEDAR 38) ABC projections and the ABCs for the three other model configurations considered in this study for Gulf of Mexico King Mackerel from.

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
Phone: 813.348.1630 • Toll free: 888.833.1844 • Fax: 813.348.1711
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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 D. 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.

References

NOAA Fisheries. 2019. Recommended use of the current Gulf of Mexico surveys of marine recreational fishing in stock assessments. Office of Science & Technology; Southeast Fisheries Science Center; Southeast Regional Office. 32 pp.