Modification to the Gulf of Mexico Migratory Group King Mackerel Catch Limits and Recreational Bag Limit

Draft Framework Amendment 15 under the Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region

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This Environmental Assessment applies CEQ's NEPA regulations currently in effect. See 50 C.F.R. § 1506.13.

ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
AM	accountability measure
BEA	Bureau of Economic Analysis
BiOp	biological opinion
BLL	bottom longline
CFR	code of federal regulations
CHTS	Coastal Household Telephone Survey
CFpA	cash flow per angler
Council	Gulf of Mexico Fishery Management Council
CS	consumer surplus
CV	coefficient of variation
Data Calibration FA	Gulf of Mexico Red Snapper Recreational Data Calibration and Recreational Catch Limits Framework Action
DLMToolkit	Data Limited Methods Toolkit
DPS	distinct population segment
EA	environmental assessment
EEZ	exclusive economic zone
EIS	economic impact statement
EFH	essential fish habitat
EFP	exempted fishing permit
EJ	environmental justice
E.O.	executive order
ESA	Endangered Species Act
F	fishing mortality rate
FES	fishing effort survey
FMP	Fishery Management Plan
GDP	Gross Domestic Product
GRSC	Great Red Snapper Count
GSAD	Gulf and South Atlantic Dealers
Gulf	Gulf of Mexico
gw	gutted weight
HCR	harvest control rule
IFQ	individual fishing quota
IPCC	Intergovernmental Panel on Climate Change
LDWF	Louisiana Department of Wildlife and Fisheries
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
mp	million pounds
MRIP	Marine Recreational Information Program
MSST	minimum stock size threshold
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration

OFL	overfishing limit
PAH	polycyclic aromatic hydrocarbons
PS	producer surplus
PW	product weight
Reef Fish FMP	Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico
RFA	Regulatory Flexibility Act
RFFA	reasonably foreseeable future actions
RIR	regulatory impact review
RQ	regional quotient
Secretary	Secretary of Commerce
SEDAR	Southeast Data and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SPR	spawning potential ratio
SRHS	Southeast Region Headboat Survey
SSC	Scientific and Statistical Committee
TAC	total allowable catch
TL	total length
TNR	trip net revenue
TPWD	Texas Parks and Wildlife Department
tpy	tons per year
UCB	uncharacterized bottom
VOC	volatile organic compounds
VMS	vessel monitoring system\
ww	whole weight

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CHAPTER 1. INTRODUCTION

1.1 Background

Framework Amendment 15 under the Fishery Management Plan (FMP) for Coastal Migratory Pelagic (CMP) Resources of the Gulf of Mexico (Gulf) and Atlantic Region is being developed by the Gulf of Mexico Fishery Management Council (Gulf Council) to address declines in harvest of Gulf king mackerel and fishermen's concern about stock abundance. Framework Amendment 15 proposes revisions to the Gulf migratory group of king mackerel total and sector annual catch limits (ACL). Additionally, the Gulf Council is considering reducing the recreational bag limit.

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 U.S.: 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 (Amendment 26; GMFMC and SAFMC 2016a) and are shown in Figure 1.1.1.

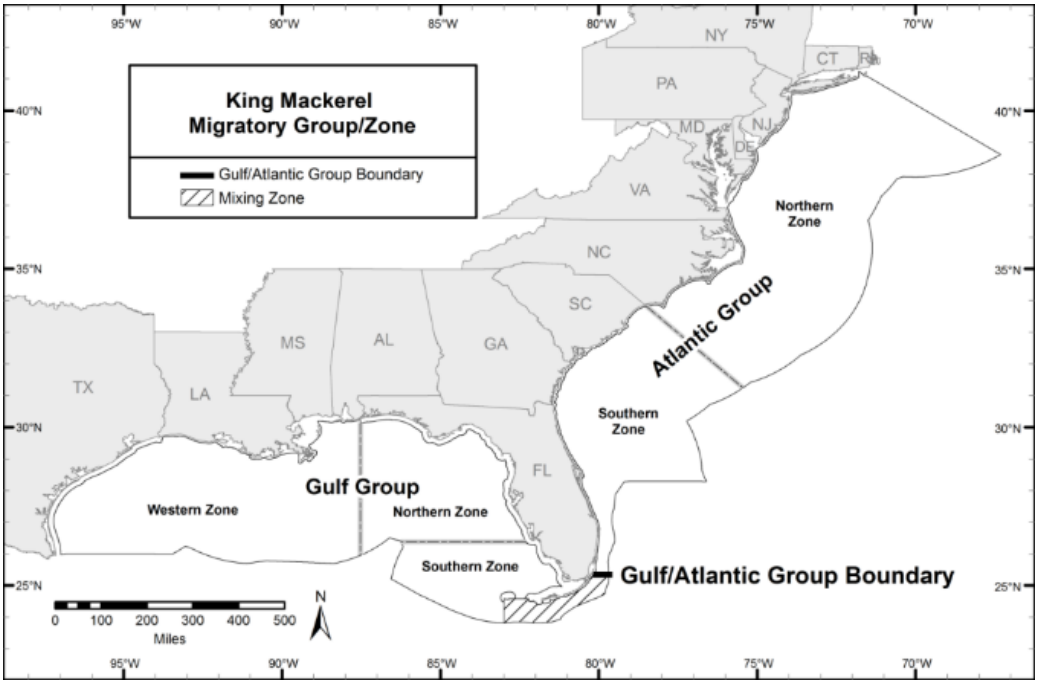

Figure 1.1.1. Gulf and Atlantic king mackerel stock boundaries as currently used for management purposes by the Councils. The Gulf management area is divided into three commercial zones, which are managed by the Gulf Council, and incorporates the mixing zone (hashed area) within the Southern Zone. The 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), contained within the Gulf Southern Zone. 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 the mixing zone (GMFMC and SAFMC 2016a). This framework 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.

Allocations

Gulf king mackerel is managed with sector allocations. The total stock ACL is divided 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 1975 through 1979. At that time, it was determined the recreational sector accounted for approximately 70% of harvest, and the commercial sector 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.

In the Gulf, the total commercial allocation (32%) is divided between three zones across two fishing fleets. The three Gulf 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 allowed in all three zones. Run-around gillnet fishing for Gulf king mackerel is allowed only in the Gulf Southern Zone. The Gulf 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.

Rationale for management modifications

The current Gulf king mackerel overfishing limit (OFL), acceptable biological catch (ABC), and total ACL were established in 2023 through Amendment 11 to the CMP FMP (Amendment 11; GMFMC 2023) based on results from the Southeast Data and Review (SEDAR) 38 Update, which was finalized in 2019 with the 2017/2018 fishing year used as the terminal year for the assessment. The SEDAR 38 Update included king mackerel recreational landings information from the Marine Recreational Information Program's Fishing Effort Survey (MRIP-FES). Previously, Gulf king mackerel recreational landings estimates were derived using the MRIP Coastal Household Telephone Survey (MRIP-CHTS). After reviewing the SEDAR 38 Update results in September 2020, the Gulf Council's Scientific and Statistical Committee (SSC) determined that the scientific uncertainty was not adequately captured by the buffer between the OFL and ABC generated using the Gulf Council's ABC Control Rule. The National Marine Fisheries Service Southeast Fisheries Science Center (SEFSC) also noted that the scientific uncertainty in the SEDAR 38 Update base model was larger than that produced by the probability distribution function in the ABC Control Rule, and that a percentage of the maximum sustainable yield (MSY) proxy may be more appropriate for defining the buffer between the OFL and ABC. Therefore, the SSC used the projected yield at the fishing mortality (F) corresponding with optimum yield (OY), or 85% of the fishing mortality at a 30% spawning potential ratio (SPR) ($F_{OY} = 0.85*F_{SPR30\%}$), to determine the ABC. The Gulf Council's SSC determined the results of the stock assessment to be consistent with 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 were recorded and monitored, respectively, in MRIP-CHTS units.[1] The updated catch advice by the SSC for the OFL and ABC

[1] Although MRIP-CHTS and MRIP-FES generate estimates measured in pounds of fish, these estimates are not directly comparable. The references to "MRIP-CHTS units" and "MRIP-FES units" signify that the estimates use different scales.

for the 2021/2022 – 2023/2024 and subsequent fishing years was in MRIP-FES units and increased annually through the 2023/24 fishing year (Table 1.1.1).

Table 1.1.1. Catch limits for Gulf king mackerel stock for 2021/2022 – 2023/2024 and subsequent fishing years, as recommended by the Gulf Council's SSC based on the results of SEDAR 38 Update. Values are in pounds (lb) whole weight (ww) and MRIP-FES units.

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

The increase in the SSC's recommended catch limits compared to the catch limits prior to SEDAR 38 Update, was largely attributable to converting the recreational catch and effort data to MRIP-FES. Had MRIP-FES recreational data been available to provide catch advice using SEDAR 38 in 2014, the current catch limit recommendations using the SEDAR 38 Update would represent an average 19% decrease in allowable catch due to model correction of the virgin biomass estimate and decreased recruitment in recent years. After the completion of the SEDAR 38 Update and during the development of Amendment 11, the Gulf Council continued to receive public comment concerning the decline in Gulf king mackerel abundance.[2] This public sentiment was echoed by the Gulf Council's CMP Advisory Panel.[3]

As a result of these stakeholder concerns, in July 2023, the Southeast Fisheries Science Center (SEFSC) provided a presentation on the results of an interim analysis (IA) for king mackerel to the SSC.[4] The IA examined both the Southeast Area Monitoring and Assessment Program (SEAMAP) fall groundfish and fall plankton surveys as representative indices of relative abundance. The IA resulted in an observed decline in recent recruitment for the stock. SEFSC staff noted that the last king mackerel assessment (SEDAR 38 Update) indicated that, while not overfished, the low level of recruitment in recent years was worrisome. Recognizing the declining trend in both indices and the sparse data in recent years, the SSC was not confident enough in the IA to use it as the basis for recommending revised catch limits from those implemented from Amendment 11 (Table 1.1.1). The Gulf Council has received repeated public comments during recent meetings indicating that the Gulf king mackerel stock is in decline and may require more conservative management measures. In response, at its October 2023 meeting, the Gulf Council made a motion to review and modify the king mackerel total ACL and recreational bag limit. The Gulf Council is considering reducing harvest by modifying the current catch limit and recreational bag limit as a result of conservation concerns for the stock. Since the SSC did not provide the Gulf Council any recommended changes to the OFL or ABC

[2] https://gulfcouncil.org/wp-content/uploads/Somethings-Fishy_-King-Mackerel-Summary-Final.pdf
[3] https://gulfcouncil.org/wp-content/uploads/CMPAP_Meeting_Summary_Feb_2024.pdf
[4] https://gulfcouncil.org/wp-content/uploads/E-5a-Gulf-Standing-RF-Socio-Eco-SSC-Summary-July-2023-07312023.pdf

based on the July 2023 IA results, the Gulf Council is not considering changes to these catch limits.

Gulf King Mackerel Landings

The Gulf king mackerel fishing year for the recreational sector and for the Gulf Western and Southern Zones of the commercial sector is July 1 – June 30. The Gulf Southern Zone gillnet component has a fixed closed season from July 1 until the Tuesday after the Martin Luther King, Jr. federal holiday (third Monday. in January). In October 2023, a rule implementing Framework Amendment 12 to the CMP FMP (GMFMC 2023) removed the weekend and holiday closures after the fishing season opens for the Gulf Southern Zone gillnet component. The fishing year for the commercial Gulf Northern Zone is October 1 – September 30.

The Gulf king mackerel total ACL is monitored in pounds (lb) of landed weight (lw), that is, combined whole and gutted weight. The commercial Florida East Coast Subzone was removed in the 2016/2017 fishing year with the implementation of Amendment 26 (GMFMC and SAFMC 2016a). Table 1.1.2 includes annual recreational, commercial, and total landings from the 2001/2002 – 2022/2023 fishing year. The recreational ACL is currently monitored using MRIP-FES. For recreational management measures, there is 24-inch minimum size limit (fork length), a 3-fish per person daily bag limit, and an in-season accountability measure (AM) that closes the fishery based on whether the recreational ACL is projected to be met or exceeded. A federal commercial vessel permit is required to land king mackerel, and there is an additional federal commercial king mackerel gillnet endorsement that is required for participation in the Gulf Southern Zone gillnet fishery. Like the recreational sector, there is a 24-inch minimum size limit (except where a vessel fishing under a quota may possess no more than 5%, by weight, of undersized king mackerel) and in-season AM.

Table 1.1.2. Annual recreational (MRIP-FES), commercial, and total king mackerel landings in lb lw. The cells highlighted in gray do not include commercial landings from the Florida east coast subzone.

Fishing Year	Recreational	Comm	Total
2001/2002	9,070,883	2,840,657	11,214,613
2002/2003	6,169,130	3,032,207	8,341,866
2003/2004	6,823,391	3,042,219	9,063,022
2004/2005	5,339,214	3,140,596	7,794,568
2005/2006	4,781,778	2,889,115	6,996,294
2006/2007	6,074,882	3,121,321	8,343,300
2007/2008	4,871,760	3,357,297	7,178,532
2008/2009	5,168,997	3,913,176	8,009,930
2009/2010	7,939,505	3,706,798	10,564,024
2010/2011	5,497,642	3,473,388	7,911,370
2011/2012	5,060,923	3,374,877	7,398,510
2012/2013	6,856,317	3,501,893	9,470,221
2013/2014	3,948,649	3,236,234	6,430,668
2014/2015	7,777,977	3,753,959	10,472,409
2015/2016	4,809,690	3,642,992	7,403,423
2016/2017	4,986,461	2,903,941	7,890,402
2017/2018	5,205,806	3,031,438	8,237,244
2018/2019	5,051,936	2,809,638	7,861,574
2019/2020	3,279,461	2,664,716	5,944,177
2020/2021	3,493,203	2,497,219	5,990,422
2021/2022	2,334,936	1,737,341	4,072,277
2022/2023	1,368,074	1,847,685	3,215,759

Source: SEFSC Recreational ACL Data (Accessed May 6, 2024) and SEFSC Commercial ACL Data (Accessed April 23, 2024).

As a result of the implementation of Framework Amendment 11, the king mackerel catch limits are in MRIP-FES units. Prior years of recreational landings data can be compared to the recreational ACL using MRIP-CHTS units (Table 1.1.3). Since the 2001/2002 fishing year, recreational harvest has not exceeded the recreational quota.

Table 1.1.3. Annual recreational (rec) landings relative to the recreational ACL for fishing years 2001/2002 – 2022/2023 in lb lw. Monitoring methods for the king mackerel recreational harvest (MRIP-CHTS to MRIP-FES) has been modified since the rule implementation for Framework Amendment 11.

Rec landings versus ACL in MRIP-CHTS Units			
Fishing Year	**Landings**	**ACL**	**% ACL**
2001/2002	3,941,457	6,936,000	56.8
2002/2003	2,983,798	6,936,000	43.0
2003/2004	3,498,288	6,936,000	50.4
2004/2005	2,564,642	6,936,000	37.0
2005/2006	2,465,383	6,936,000	35.5
2006/2007	3,319,495	7,344,000	45.2
2007/2008	2,464,224	7,344,000	33.6
2008/2009	2,790,428	7,344,000	38.0
2009/2010	3,261,388	7,344,000	44.4
2010/2011	1,993,088	7,344,000	27.1
2011/2012	2,012,068	7,344,000	27.4
2012/2013	3,224,351	7,344,000	43.9
2013/2014	2,082,852	7,344,000	28.3
2014/2015	4,015,683	7,344,000	54.7
2015/2016	2,531,260	7,344,000	34.5
2016/2017	2,587,187	6,260,000	41.3
2017/2018	2,356,343	6,040,000	39.0
2018/2019	2,338,564	5,920,000	39.5
2019/2020	1,622,334	5,810,000	27.9
2020/2021	1,729,718	5,810,000	29.8
2021/2022	1,022,994	5,810,000	17.6
Rec landings versus ACL in MRIP-FES Units			
Fishing Year	**Landings**	**ACL**	**% ACL**
2022/2023	1,368,074	6,609,600	20.7

Source: SEFSC Recreational ACL Data (Accessed May 6, 2024).

Commercial harvest of Gulf king mackerel has been subject to changes in the mixing zone delineation and management boundaries (see Amendment 26, GMFMC and SAFMC 2016a). Commercial landings from the 2001/2002 – 2022/2023 fishing years are compared to the total commercial ACL in effect for those fishing years and include landings from the former Florida East Coast Subzone (Table 1.1.2). Commercial landings by zone for the commercial sector since the 2001/2002 fishing year are provided in Table 1.1.4. The most recent two years of commercial landings are substantially lower than what has been reported since the 2001/2002 fishing year.

Table 1.1.4. Reported zone-specific annual commercial landings relative to the total commercial ACL since 2001/2002 – 2002/2003 fishing year in lb lw. HL = hook-and-line; GN = gillnet

Fishing Year	Northern HL	East FL HL	Southern GN	Southern HL	Western HL	Com Landings	Com ACL	% ACL
2001/2002	222,916	696,927	316,814	702,997	901,003	2,840,657	3,264,000	87.0
2002/2003	148,115	859,471	349,924	724,848	949,849	3,032,207	3,264,000	92.9
2003/2004	186,341	802,588	458,194	613,714	981,382	3,042,219	3,264,000	93.2
2004/2005	105,108	685,242	645,985	609,903	1,094,358	3,140,596	3,264,000	96.2
2005/2006	140,989	674,599	491,046	714,921	867,560	2,889,115	3,264,000	88.5
2006/2007	159,083	852,903	468,044	620,290	1,021,001	3,121,321	3,456,000	90.3
2007/2008	214,417	1,050,525	586,800	555,902	949,653	3,357,297	3,456,000	97.1
2008/2009	276,998	1,072,243	845,017	734,118	984,800	3,913,176	3,456,000	113.2
2009/2010	287,838	1,082,279	589,462	706,442	1,040,777	3,706,798	3,456,000	107.3
2010/2011	341,775	1,059,660	522,267	637,974	911,712	3,473,388	3,456,000	100.5
2011/2012	267,958	1,037,290	437,040	622,864	1,009,725	3,374,877	3,456,000	97.7
2012/2013	216,184	887,989	498,609	810,156	1,088,955	3,501,893	3,456,000	101.3
2013/2014	246,110	754,215	595,382	611,227	1,029,300	3,236,234	3,456,000	93.6
2014/2015	100,051	1,059,527	543,730	686,285	1,364,366	3,753,959	3,456,000	108.6
2015/2016	182,600	1,049,259	529,745	658,723	1,222,665	3,642,992	3,456,000	105.4
2016/2017	474,860		538,213	731,655	1,159,213	2,903,941	2,950,000	98.4
2017/2018	538,315		552,775	872,203	1,068,145	3,031,438	2,840,000	106.7
2018/2019	397,926		631,210	687,587	1,092,914	2,809,638	2,790,000	100.7
2019/2020	325,294		521,318	629,797	1,188,306	2,664,716	2,740,000	97.3
2020/2021	539,992		587,320	501,192	868,715	2,497,219	2,740,000	91.1
2021/2022	298,391		594,339	426,814	417,797	1,737,341	2,998,400	57.9
2022/2023	428,048		615,524	440,307	363,806	1,847,685	3,110,400	59.4

Source: SEFSC Commercial ACL Data (Accessed April 23, 2024).

Gulf King Mackerel Recreational Bag Limit Management History

Bag limits are used as management measure to slow harvest of a stock and extend the fishing season duration. Changes to the recreational bag limit have occurred thought the management history of Gulf king mackerel. Selected events in Gulf king mackerel recreational bag limit management measures include the establishment of a 2 fish per person for the private recreational component and a 3 fish per person bag limit for those fishing on a for-hire vessel, the crew excluded (GMFMC 1986). Amendment 5 redefined recreational bag limits as daily limits (GMFMC 1990). The for-hire bag limit was later reduced to 2 fish per person and then included the captain and crew of the charter (GMFMC 1992). Amendment 26 modified the recreational daily bag limits for all recreational anglers on both private and for-hire trips to 3 fish per person (Amendment 26; GMFMC and SAFMC 2016a). A complete management history for Gulf king mackerel, including modification to the recreational bag limits, is outlined in section 1.3.

1.2 Purpose and Need

The purpose of this framework action is to modify the Gulf king mackerel catch limits and recreational bag limit based on management uncertainty for this stock.

The need for this framework action is to reduce harvest to address concerns with stock-based declines in fishery landings and stakeholder concern. From public comments, stakeholders have indicated a decline in abundance and additional management measures are needed to address this observation.

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. Atlantic cobia is managed by the Atlantic States Marine Fisheries Commission. 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 **Amendment 18** to the CMP FMP (GMFMC and SAFMC 2011), **Amendment 20B** to the CMP FMP (GMFMC and SAFMC 2014), and **Amendment 26** (GMFMC and SAFMC 2016a) and are incorporated here by reference. A complete history of management for CMP species is provided on the Gulf Council website.[5] 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 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 included 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 million pounds (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).

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

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 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 sector, 50% – hook-and-line sector.

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 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.

Amendment 11 with EA, RIR, and RFA, implemented in January 2023, updated the private recreational data used to monitor Gulf migratory group king mackerel landings to MRIP-FES and specified new catch limits based on results from the SEDAR 38 update stock assessment.

Amendment 12 removed the weekend and holiday closure for the Gulf of Mexico Migratory group king mackerel commercial Southern Zone Gillnet component. The rule became effective in October 2023.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1: Modify the Gulf of Mexico (Gulf) Migratory Group King Mackerel Total and Fishing Sector-Specific Annual Catch Limits (ACL)

Alternative 1: No Action. Retain the current overfishing limit (OFL), acceptable biological catch (ABC), and total and sector-specific ACLs for Gulf king mackerel as established in Framework Amendment 11 under the Fishery Management Plan (FMP) for Coastal Migratory Pelagic (CMP) Resources in the Gulf of Mexico and Atlantic Region (CMP FMP). The Gulf king mackerel total ACL is equal to the ABC.

Fishing Year	OFL	ABC	Total ACL	Rec ACL	Comm ACL
2023/2024+	11,180,000	9,990,000	9,990,000	6,793,200	3,196,800

Catch limit values are in pounds (lb) landed weight (lw).

Alternative 2: Retain the current OFL and ABC and modify the total ACL for Gulf king mackerel based on recent landings information. Recreational and commercial ACLs would also be modified based on the current sector allocations of 68% recreational and 32% commercial. The Gulf king mackerel total ACL would be reduced compared to the ABC based on one of the options below (all values in lb lw). The modified total ACL, and recreational and commercial ACLs, would remain in place until modified by future management action.

Option 2a: Set the total ACL based on a 3-year average of fishing years. (2020/2021-2022/2023)

Fishing Year	Total ACL	Rec ACL	Comm ACL
2023/2024+	4,426,153	3,009,784	1,416,369

Option 2b: Set catch limits based on the 3-year average of fishing years with an additional 20% reduction. (2020/2021-2022/2023)

Fishing Year	Total ACL	Rec ACL	Comm ACL
2023/2024+	3,540,922	2,407,827	1,133,095

Option 2c: Set catch limits based on the 5-year average of fishing years. (2018/2019-2022/2023)

Fishing Year	Total ACL	Rec ACL	Comm ACL
2023/2024+	5,416,842	3,683,452	1,733,389

Option 2d: Set catch limits based on the 5-year average of fishing years with an additional 20% reduction. (2018/2019-2022/2023)

Fishing Year	Total ACL	Rec ACL	Comm ACL
2023/2024+	4,333,473	2,946,762	1,386,711

Discussion:

Alternative 1 (No Action) would retain the current Gulf king mackerel total ACL. The results of the SEDAR 38 Update indicated that the Gulf king mackerel stock was not overfished and not undergoing overfishing as of 2021. The Gulf of Mexico Fishery Management Council's (Gulf Council) Scientific and Statistical Committee (SSC) recommended an OFL based on the projections from the SEDAR 38 Update assessment. The SSC also set the ABC, which is currently equal to the ACL, based on the projected fishing mortality at optimum yield (F_{OY}). Therefore, harvest of Gulf king mackerel up to the current ACL has been recommended as sustainable for the stock by the Gulf Council's SSC and is a viable alternative.

Scientific and management uncertainty remains considerable for Gulf king mackerel. The species migrates seasonally and there is limited fishery-independent information of relative abundance to assess population trends in the stock. O**ptions 2a** – **2d** in **Alternative 2** would lower the catch levels relative to **Alternative 1** based on declines in recent landings along with stakeholder input that the declines were related to changes in abundance rather than changes in management or angler behavior. **Option 2a** would calculate a total ACL using an average of the most recent 3 fishing years of total landings. **Option 2b** would apply a 20% buffer reduction to what is proposed in **Option 2a**. Like **Option 2a**, **Option 2c** would modify the total ACL using recent landings, but over a longer averaged time period of 5-years. **Option 2d** would apply a 20% buffer reduction to what is proposed in **Option 2c**.

A reduction in harvest to achieve additional conservation benefits of the stock and reduce fishing mortality may result in a seasonal closure. The most recent 5 years of recreational landings have ranged from approximately 1.4 to 5.0 million pounds (mp) lw (Table 1.1.2). Therefore, there is a possibility that the recreational sector would experience an in-season closure under the recreational ACLs presented in **Options 2a** – **2d** in **Alternative 2**, but not under **Alternative 1**.

The most recent 5 years of commercial landings have ranged from approximately 1.7 to 2.8 mp lw (Table 1.1.2). It is possible that the commercial sector could realize an in-season closure in either **Alternative 1** or **Options 2a** – **2d** in **Alternative 2**. Commercial harvest slightly exceeded (0.7%) of its sector ACL during the 2018/2019 fishing year; however, the two most recent commercial fishing years have reported considerably lower landings (approximately 1.75 mp lw) relative to the past 20 years (Table 1.1.4). In the last two decades, management of the King mackerel commercial sector has been relatively consistent; as such, it is highly likely that the decline in commercial harvest is related to changes in the abundance of the stock rather than effects of management measures.

Table 2.1.1. Total commercial ACL, commercial zone quotas, and Gulf-wide hook and line ACL values for Action 1 alternatives and options. **Alternative 1** would retain the current zone ACLs while **Options 2a** – **2d** in **Alternative 2** would result in a modification of the total commercial ACL, commercial zone quotas, and Gulf-wide hook and line ACL. HL=hook and line; GN=gillnet. Quotas and ACL are in lb lw.

Alternative 1	**Commercial ACL**	**West Zone Quota**	**North Zone Quota**	**South Zone (HL) Quota**	**Gulf-wide HL ACL**	**South Zone (GN) Quota**
	3,196,800	1,278,720	575,424	671,328	2,525,472	671,328
Alternative 2	**Commercial ACL**	**West Zone Quota**	**North Zone Quota**	**South Zone (HL) Quota**	**Gulf-wide HL ACL**	**South Zone (GN) Quota**
Option 2 a	1,416,369	566,548	254,946	297,437	1,118,931	297,437
Option 2b	1,133,095	453,238	203,957	237,950	895,145	237,950
Option 2c	1,733,389	693,356	312,010	364,012	1,369,378	364,012
Option 2d	1,386,711	554,685	249,608	291,209	1,095,502	291,209

For Gulf commercial zones using hook-and-line gear, each zone has exceeded its quota at least once since the 2016/2017 (Table 2.2.2). However, since the 2020/20221 fishing year, the western and southern hook-and-line zone have seen marked declines in landings relative to their respective quotas. While the North Zone did exceed the quota during the 2020/2021 fishing year, recent landings are low as well, but the zone is not experiencing as substantial a decline as the other two hook-and-line regions. Based on recent landings information, it is likely that the North and South zones would experience an in-season closure with the implementation of any **Options 2a** – **2d** in **Alternative 2**. It is less clear that an in-season closure would result in the West Zone.

Table 2.1.2. Commercial landings for the West Zone (WZ), North Zone (NZ), and South Zone (SZ) hook-and-line components of the sector in comparison the zone-specific quotas since the 2016/2017 fishing year. Values are reported as lb lw. Gray cells indicate years when a zone quota was exceeded.

Year	**WZ**	**WZ Quota**	**% WZ Quota**	**NZ**	**NZ Quota**	**% NZ Quota**	**SZ**	**SZ Quota**	**% SZ Quota**
2016/2017	1,159,213	1,180,000	98.2	474,860	531,000	89.4	731,655	619,500	118.1
2017/2018	1,068,145	1,136,000	94.0	538,315	511,200	105.3	872,203	596,400	146.2
2018/2019	1,092,914	1,116,000	97.9	397,926	502,200	79.2	687,587	585,900	117.4
2019/2020	1,188,306	1,096,000	108.4	325,294	493,200	66.0	629,797	575,400	109.5
2020/2021	868,715	1,096,000	79.3	539,992	493,200	109.4	501,192	575,400	87.1
2021/2022	417,797	1,096,000	38.1	298,391	493,200	60.5	426,814	575,400	74.2
2022/2023*	363,806	1,244,160	29.2	428,048	559,872	76.5	440,307	653,184	67.4

*Denotes that the landings from this fish year are considered preliminary and was obtained from the Southeast Region Annual Catch Limit Monitoring webpage. Accessed June 13, 2024. https://www.fisheries.noaa.gov/southeast/sustainable-fisheries/southeast-region-annual-catch-limit-acl-monitoring . All other years were obtained from SEFSC Commercial ACL Data (Accessed April 23, 2024).

Landings from the South Zone gillnet component of the Gulf king mackerel commercial sector has exceeded the annual quota three times since the 2016/2017 fishing year including a payback

for the 2019/2020 fishing year (Table 2.2.3). Recent landings information suggests that the South Zone gillnet is most likely to experience an in-season closure (and possible payback) relative to the other hook-and-line commercial zones for any of the **Options 2a** – **2d** in **Alternative 2**. While preliminary, last years landings of 97% of the South Zone gillnet quota indicates this component of the Gulf king mackerel commercial sector continues to harvest to its current catch levels. The zone is also subject to payback provisions which may further reduce catch limits year-to-year if any one of the **Options 2a** – **2d** in **Alternative 2** is implemented.

Table 2.1.3. Commercial landings for the South Zone gillnet relative to the quota since the 2016/2017 fishing year. Values are reported as lb lw. Gray cells indicate years when the zone quota was exceeded.

Year	South Zone GN	South Zone GN Quota	% Quota
2016/2017	538,213	619,500	86.9
2017/2018	552,775	596,400	92.7
2018/2019	631,210	585,900	107.8
2019/2020†	521,318	530,043	98.4
2020/2021	587,320	575,400	102.1
2021/2022	594,339	575,400	103.3
2022/2023*	615,524	634,222	97.1

*Denotes that the landings from this fish year are considered preliminary and was obtained from the Southeast Region Annual Catch Limit Monitoring webpage. Accessed June 13, 2024. https://www.fisheries.noaa.gov/southeast/sustainable-fisheries/southeast-region-annual-catch-limit-acl-monitoring . All other years were obtained from SEFSC Commercial ACL Data (Accessed April 23, 2024).
† Denotes a fishing year when a quota payback was implemented.

It is unclear if these most recent Gulf king mackerel landings will continue to remain at relatively low levels. Results from the most recent interim analysis (IA)[6] provided by the Southeast Fishery Science Center (SEFSC) to the Scientific and Statistical Committee (SSC) in July 2023 documented a downward trend in recruitment from both the fall plankton and groundfish trawl surveys possibly indicating reduced stock productivity (Figure 2.1.1). These IA results would be in agreement with recent stakeholder input that Gulf king mackerel is not, at the moment, in a healthy state. However, the highly variable in count data in the fishery-independent survey in addition to a few years of data gaps within the fall plankton survey is difficult to interpret. Therefore, the SSC could not explicitly provide the Council with catch advice based on the results of the IA.[7]

[6] https://gulfcouncil.org/wp-content/uploads/11a-SEDAR38U_2023IA_SSC_final.pdf
[7] https://gulfcouncil.org/wp-content/uploads/E-5a-Gulf-Standing-RF-Socio-Eco-SSC-Summary-July-2023-07312023.pdf

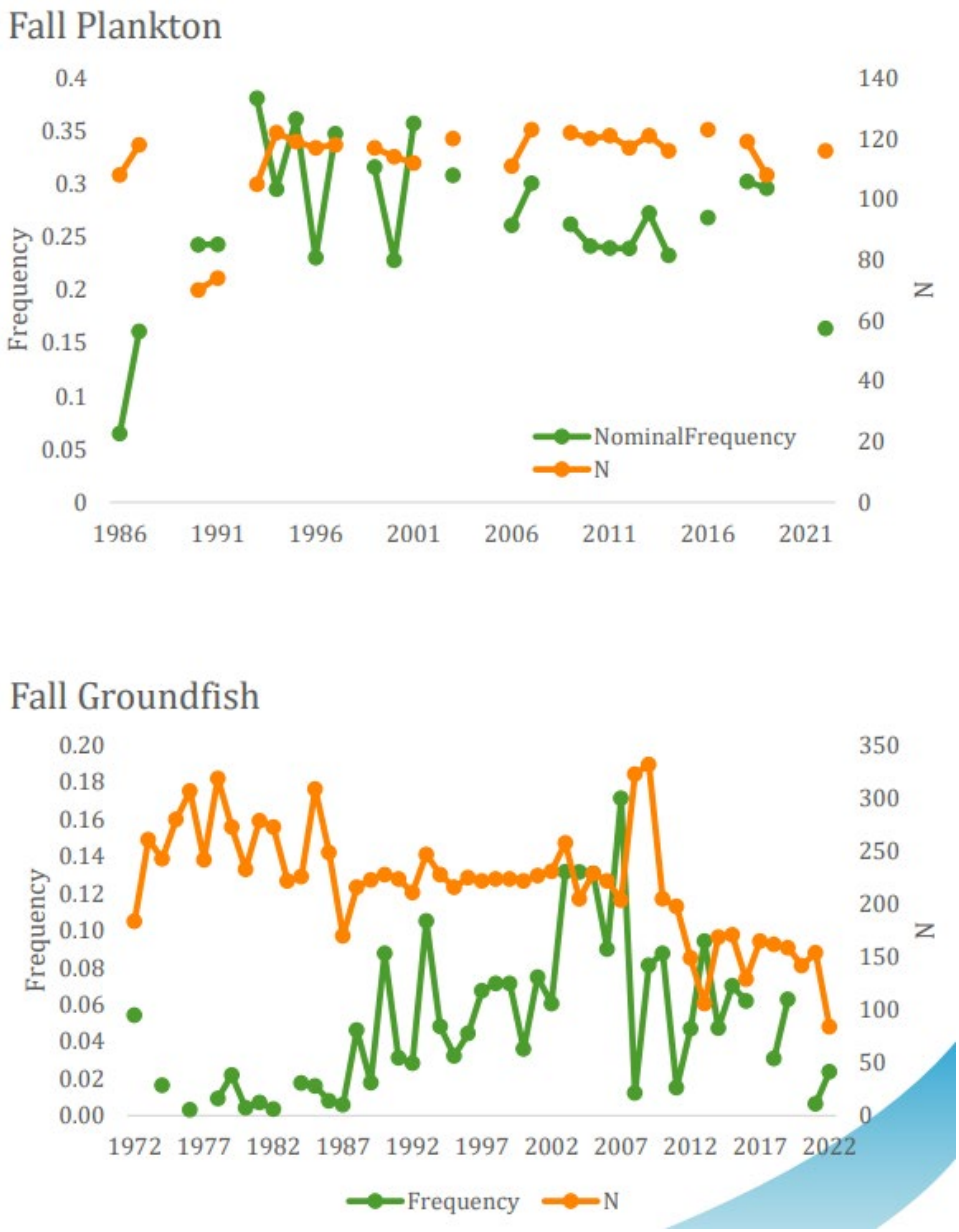

Figure 2.1.1. Frequency of occurrence results from two Gulf fishery-independent surveys included in a Gulf king mackerel IA presentation provided by SEFSC staff during the July 2023 SSC meeting.[6] Fishery-independent indices results of larval (fall plankton) and juvenile (fall groundfish) Gulf king mackerel have been highly variable, and at times in the larval survey observed no fish. However, recent declines in recruitment have been observed.

2.2 Action 2: Modify the Gulf Migratory Group King Mackerel Recreational Daily Bag Limit

Alternative 1: No Action. Do not modify the recreational daily bag limit of 3 fish per person.

Alternative 2: Reduce the recreational daily bag limit to 2 fish per person.

Alternative 3: Reduce the recreational daily bag limit to 1 fish per person.

Discussion:

The Gulf Council is considering modifying the Gulf king mackerel recreational daily bag limit to decrease recreational harvest and address stock abundance and health concerns. A**lternative 1** (No Action) would retain the current recreational daily bag limit of 3 fish per person, while **Alternatives 2** and **3** would reduce the daily bag limit to 2 fish and 1 fish per person, respectively. A description of the daily bag limit reduction analysis, seasonal projection analysis, and summaries of data from the 2018/2019 to 2022/2023 fishing years can be viewed in Appendix A.

Since the 2001/2002 fishing season, recreational landings have been substantially below the ACL (Table 1.1.3). Results from the 2020/2021 – 2022/2023 fishing years indicate that most recreational anglers only harvest one Gulf king mackerel per person on recreational fishing trips (Figure 2.2.1) for both components of the recreational sector (for-hire/headboat and private) Gulf-wide. For charter vessel and headboat fleet, a substantial portion of trips harvest approximately 1 fish per person. These vessels often have numerous anglers (e.g., 6 or more) on board such that fractional numbers may result (e.g., 3 Gulf king mackerel landed on a for-hire trip with 6 anglers on board would equal 0.5 fish harvested per angler). Data collected from private recreational vessels result in a similar outcome with the substantial proportion of trips also harvesting an average of 1 fish per person (or less). Broadly, fishermen in the Gulf already harvest less than the current 3-fish daily bag limit in **Alternative 1**.

The number of retained Gulf king mackerel varies between recreational fleet type and area fished. For the charter component by region, there are observations of 2 fish harvested per person per day with most of those occurrences happening in Texas, followed by the eastern Gulf (Mississippi, Alabama, and Florida), and then Louisiana. The headboat component appears to harvest an average of one king mackerel or less per person on nearly every trip where a king mackerel is harvested Gulf-wide. The private recreational fleet varies the most relative to the other two recreational components, with approximately 25% of trips harvesting 2 or 3 Gulf king mackerel.

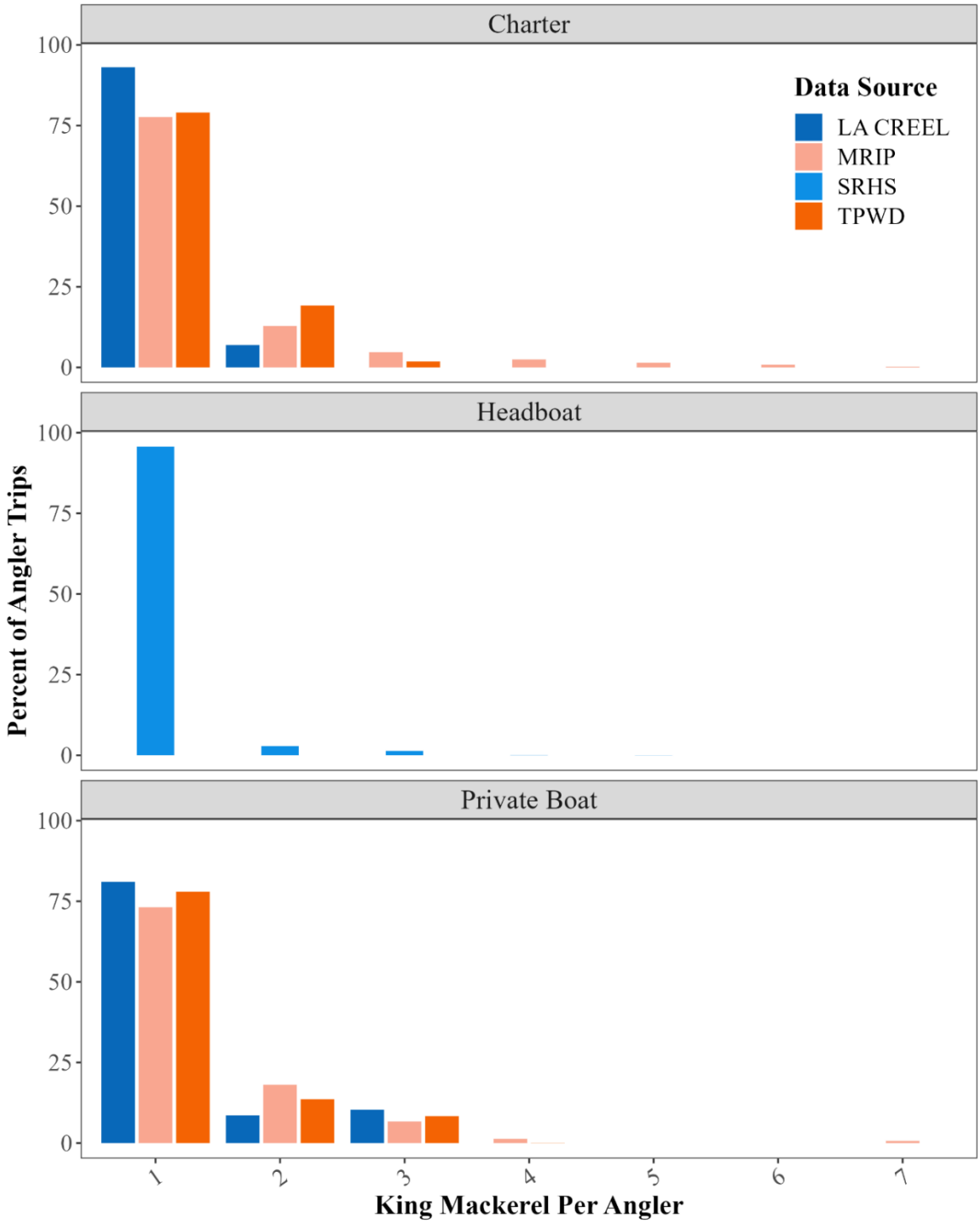

Figure 2.2.1. Distribution of Gulf king mackerel harvested per angler per day by recreational fishing fleet and dataset. Dockside data aggregated from the 2020/2021 to 2022/2023 fishing years.

As a result, a modification to the recreational daily bag limit under **Alternatives 2** and **3** vary in the expected reduction of recreational harvest for Gulf king mackerel depending on spatial scale (Table 2.2.1). As expected, predicted reductions are greatest under **Alternative 3** relative to **Alternative 2** for every fleet in every area of the Gulf. Under **Alternative 2**, recreational harvest reduction would range from 1.7 to 13.4% by fleet and region. Under **Alternative 3**, recreational harvest reduction would range from 7.8 to 36.9% by fleet and region.

Table 2.2.1. Proposed recreational daily bag limit alternatives and associated percent reduction for each alternative, by fishing fleet and data source, using dockside data from 2020/2021 to 2022/2023.

Alternatives	Data Source	Private Boat	Charter	Headboat
Alternative 1 (No Action): 3 Fish Daily Bag Limit	LA CREEL	0.0	0.0	0.0
	MRIP	0.0	0.0	0.0
	TPWD	0.0	0.0	0.0
	SRHS	0.0	0.0	0.0
Alternative 2 : 2 Fish Daily Bag Limit	LA CREEL	-13.4	0.0	0.0
	MRIP	-6.8	-16.0	0.0
	TPWD	-11.6	-1.7	0.0
	SRHS	0.0	0.0	-6.9
Alternative 3: 1 Fish Daily Bag Limit	LA CREEL	-36.9	-7.8	0.0
	MRIP	-23.4	-33.9	0.0
	TPWD	-35.2	-17.6	0.0
	SRHS	0.0	0.0	-23.0

The reductions expected by a modification to the recreational daily bag limit on a regional spatial scale are sufficient to reduce harvest Gulf-wide beyond the recreational catch limit reductions considered in Action 1 in some cases (Figures 2.2.2 and 2.2.3 and Tables 2.2.2 and 2.2.3). A summary of the season projection analysis method available in Appendix A. Daily average catch rate was used to inform the season duration projection analysis and varied by year (Appendix A; Figures A3 and A4). Predicting season duration using the possible combinations of alternatives in Action 1 and **Action 2**, using catch rates informed by the most recent 3 fishing seasons (2020/2021-2022/2023) resulted in no recreational in-season closure for any alternative combination (Figure 2.2.2 and Table 2.2.2). However, **Option 2b** in **Action 1** and **Action 2 Alternative 1** would come close to resulting in a in-season closure for this analysis (Figure 2.2.2). Another projection analysis calculating daily catch rate based on the most recent 5 fishing years (2018/2019-2022/2023) indicated that recreational season closures may be realised for **Option 2b** in **Action 1** and all alternatives in **Action 2** (Figure 2.2.3 and Table 2.2.3). An in-season closure may also be expected for both **Option 2a** and **Option 2d** in **Action 1** if selected either is selected with **Action 2 Alternative 1** (Table 2.2.3). However, **Option 2a** and **Option 2d** in **Action 1** do come close to a predicted recreational in-season closure when either is selected with **Action 2 Alternative 2** (Figure 2.2.3).

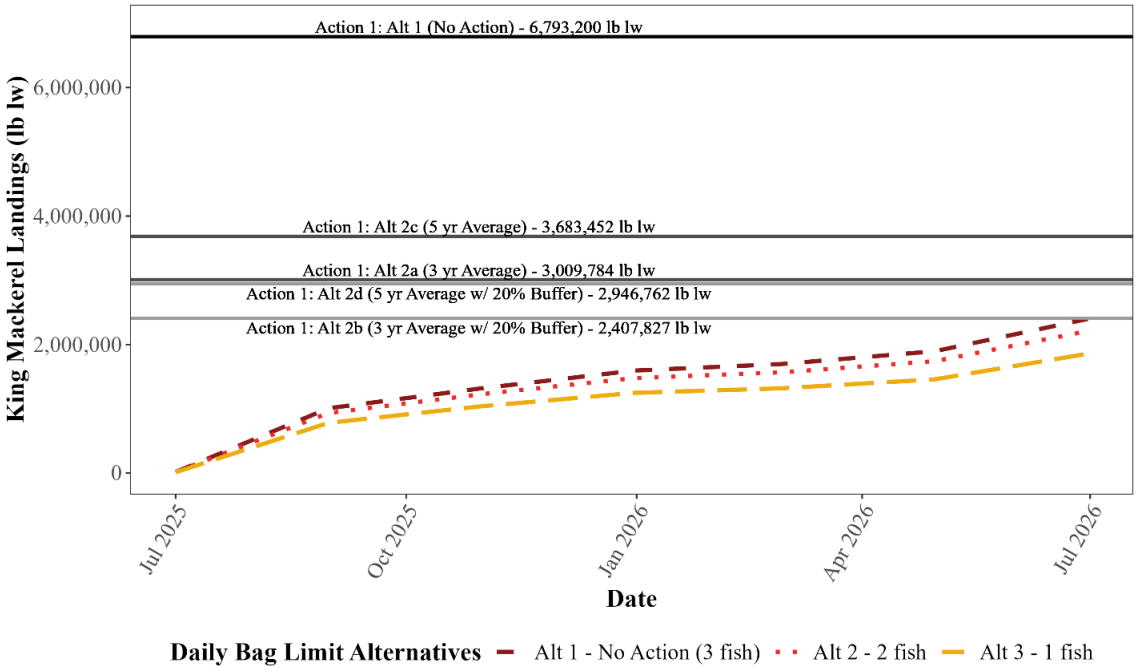

Figure 2.2.2. Cumulative sum of projected daily landings for the three bag limit alternatives in Action 2. Projected landings are averaged over the 3 most recent fishing years.

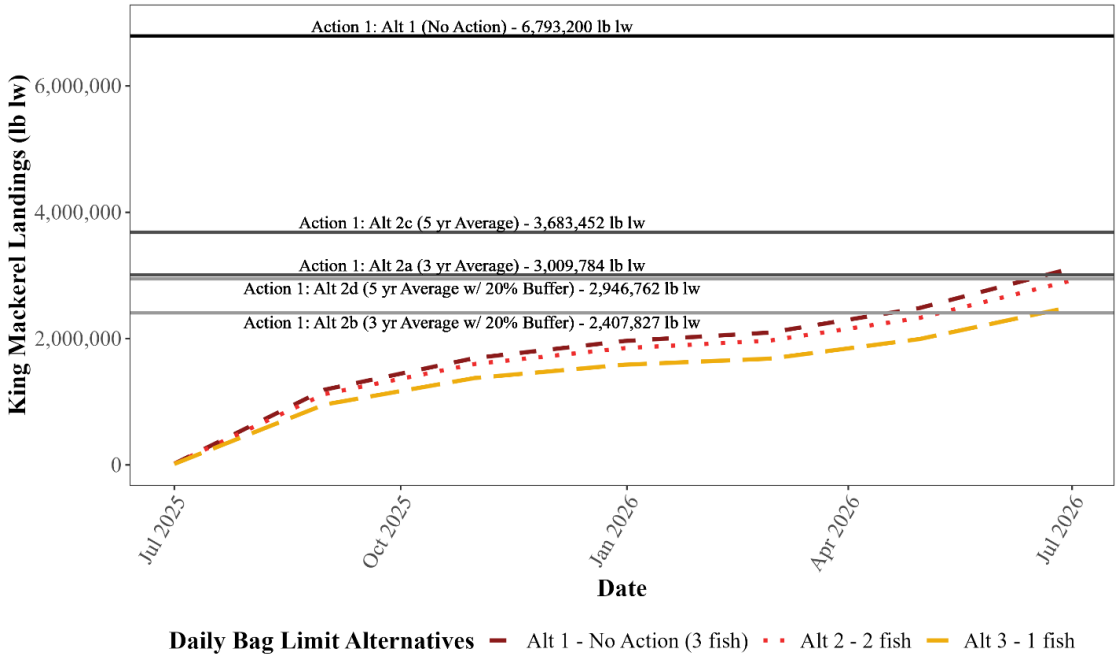

Figure 2.2.3. Cumulative sum of projected daily landings for the three bag limit alternatives in Action 2. Projected landings are averaged over the 5 most recent fishing years.

Table 2.2.2. Predictions for when Gulf king mackerel ACLs would be met for the proposed bag limits under the **Action 1**: **Alternative 1, Options 2a** and **2b.** The projected landings used to project closure dates is based on an average of the 3 most recent fishing years. Dashes indicate no closure is projected.

Action 1: Proposed ACL	Action 2: Recreational Daily Bag Limit	ACL Met	Approx. Days
Alternative 1 (No Action): Current ACL 6,793,200 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2a: 3 Year Average 3,009,784 (lb lw)	Alternative 1 (No Action): 3 Fish	-	355
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2b: 3 Year Average w/ 20% buffer 2,407,827 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2c: 5 Year Average 3,683,452 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2d: 5 Year Average w/ 20% buffer 2,946,762 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365

Table 2.2.3. Predictions for when Gulf king mackerel ACLs would be met for the proposed bag limits under the **Action 1**: **Alternative 1, Options 2c** and **2d.** The projected landings used to project closure dates is based on an average of the 3 most recent fishing years. Dashes indicate no closure is projected.

Action 1: Proposed ACL	Action 2: Recreational Daily Bag Limit	ACL Met	Approx. Days
Alternative 1 (No Action): Current ACL 6,793,200 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2a: 3 Year Average 3,009,784 (lb lw)	Alternative 1 (No Action): 3 Fish	21-Jun	355
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2b: 3 Year Average w/ 20% buffer 2,407,827 (lb lw)	Alternative 1 (No Action): 3 Fish	19-Apr	292
	Alternative 2: 2 Fish	9-May	312
	Alternative 3: 1 Fish	20-Jun	354
Alternative 2c: 5 Year Average 3,683,452 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2d: 5 Year Average w/ 20% buffer 2,946,762 (lb lw)	Alternative 1 (No Action): 3 Fish	15-Jun	349
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365

CHAPTER 3. LIST OF PREPARERS

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

CHAPTER 4. REFERENCES

To be completed later.

APPENDIX A. GULF OF MEXICO KING MACKEREL BAG LIMIT AND SEASON DURATION ANALYSIS

LAPP/DM Branch
NOAA Fisheries Service
Southeast Regional Office
June 2024

The Gulf of Mexico Fishery Management Council (Gulf Council) is considering changes to the total and sector Gulf king mackerel catch limits in Framework Amendment 15 under the Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region. Additionally, the Gulf Council is considering reducing the daily bag limit for the recreational sector. The current recreational daily bag limit is 3 fish per person. This analysis will evaluate three daily bag limit alternatives: No Action (3 fish per person), 2 fish per person, and 1 fish per person to determine whether the proposed sector annual catch limits (ACL) will be exceeded under each scenario (**Table A1**).

Table A1. Proposed Gulf king mackerel recreational ACL alternatives, in pounds landed weight (lb lw).

Alternatives	**Annual Catch Limit (lb lw)**
Alternative 1 (No Action): Current Recreational ACL	6,793,200
Alternative 2a: Set the total ACL based on the most recent 3-year average of the most recent fishing years. (2020/2021-2022/2023)	3,009,784
Alternative 2b: Set catch limits based on the most recent 3-year average of the most recent fishing years with an additional 20% reduction. (2020/2021-2022/2023)	2,407,827
Alternative 2c: Set catch limits based on the most recent 5-year average of the most recent fishing years. (2018/2019-2022/2023)	3,683,452
Alternative 2d: Set catch limits based on the most recent 5-year average of the most recent fishing years with an additional 20% reduction. (2018/2019-2022/2023)	2,946,762

Data Sources

The Southeast Fisheries Science Center (SEFSC) generates monitoring datasets that are used to track landings for all federally managed species in the commercial and recreational sector. Landings for the recreational sector are estimated from a combination of state and federal surveys. The two state surveys that generate recreational landings estimates come from Texas and Louisiana. The Texas Parks and Wildlife Department Sport-boat Angling Survey (TPWD) uses dockside interviews at public recreational boat access sites to generate catch and effort estimates for finfish species caught by private vessel and charter operators off the Texas coast.

In Louisiana, the Louisiana Department of Wildlife & Fisheries uses the combination of a dockside intercept survey and phone/email survey to estimate recreational saltwater harvests from shore, private vessels and charter trips (LA Creel).

Federally administered surveys generate landings estimates for all headboat vessels and landings from shore, private vessels and charter vessels not covered by the Texas or Louisiana state surveys. The Southeast Region Headboat Survey (SRHS) produces landings estimates for species caught by headboats operating in the southeastern United States by combining dockside intercept and logbook data. Federal estimates of shore, private vessel and charter vessel landings were initially generated by the Marine Recreational Fisheries Statistics Survey (MRFSS), which used a combination of dockside intercept survey and telephone effort survey data to estimate landings. This survey was replaced by the Marine Recreational Information Program (MRIP) in 2008 to improve precision, accuracy, and timeliness of recreational catch estimates. MRIP uses the Access Point Angler Intercept Survey (APAIS) to collect dockside catch data from anglers fishing from shore, private vessels and charter vessels. Fishing effort data for the shore and private vessel fishing modes was collected by the Coastal Household Telephone Survey (CHTS), and charter vessel effort was estimated from data collected by the For-Hire Telephone Survey (FHTS). In 2018, the CHTS was replaced by a mail survey, the Fishing Effort Survey (FES). The changes to the federal survey over time have led to recreational landings being estimated in three different data units associated with the major changes to those surveys. MRFSS units represent the earliest iteration of the federal survey; MRIP-CHTS incorporates updates to the dockside APAIS and implementation of the improved CHTS phone survey; and, MRIP-FES incorporates the change from a telephone- to a mail-based effort survey. The SEFSC creates three separate final recreational landings datasets that combine TPWD, LA Creel and SRHS landings estimates with either the MRFSS, MRIP-CHTS, or MRIP-FES survey estimates. Catch limits for federally managed species are monitored with the recreational data unit associated with the last stock assessment for each species.

This analysis will use a combination of Gulf king mackerel dockside trip interview data and recent landings data to generate season duration projections for the proposed ACL alternatives in conjunction with proposed daily bag limit alternatives.

Daily Bag Limit Analysis

Gulf dockside data from the TPWD, LA Creel, SRHS, and APAIS surveys were explored to determine the current distribution of king mackerel harvest per person. The percentage of angler trips associated with the harvest per person was calculated using dockside interview data from the last 3 and 5 fishing years. These time periods were used to match the year ranges used to calculate the proposed recreational ACL alternatives for king mackerel landings. The percentages were calculated by fleet and data source for intercepted trips that landed king mackerel (**Figures A1** and A**2**). Most recreational angler trips, more than 70% for all data sources, harvest a single king mackerel.

To investigate each daily bag limit alternative, a percent reduction in catch was calculated to estimate the decrease in landings that would be associated with each daily bag limit alternative.

If an angler's harvest was higher than the proposed alternative, that harvest value was changed to match the maximum harvest allowed by the proposed alternative. For example, when evaluating Action 2 Alternative 3 (1 fish per person daily bag limit), if an angler trip record indicated harvest of 3 king mackerel, the landing value was changed from 3 to 1 fish to match the maximum allowable harvest for that alternative. The final percent reduction was calculated by dividing the harvest from each alternative by the harvest from the No Action alternative. This process was completed twice, using dockside data from either the last 3 or 5 fishing years to match percent reductions with the proposed ACL time periods (**Table A2** and A**3**). The percent reductions were evaluated at the fleet and data source level to ensure that differences in catch rates were incorporated into the analysis.

Next, the projected daily landing rate for each recreational fleet and data source was calculated by averaging landings over the last 3 and 5 fishing years to represent the catch rates associated with the time periods used to generate the proposed king mackerel ACL values. The percent reductions were applied to the average daily landings rates for each fleet and data source to generate daily landings rates associated with each bag limit alternative. The fleet averages were then aggregated to generate a sector level daily landing rate for each bag limit alternative. The 3 and 5 year projected daily recreational landings were summed cumulatively and compared to the proposed ACL values associated with those time periods (**Figures A3** and **A4**). A closure was only projected for the ACL alternative using a 5-year average with a 20% reduction (Action 1, Alternative 2d) and the current daily bag limit (Action 2, Alternative 1), with the closure projected to occur late in the last month of the fishing year (**Tables A4** and **A5**). In all other scenarios, the projected landings for all daily bag limit alternatives show landings increasing over the course of the fishing year, without crossing the lowest proposed ACLs (Action 1 Alternatives 2b and 2d).

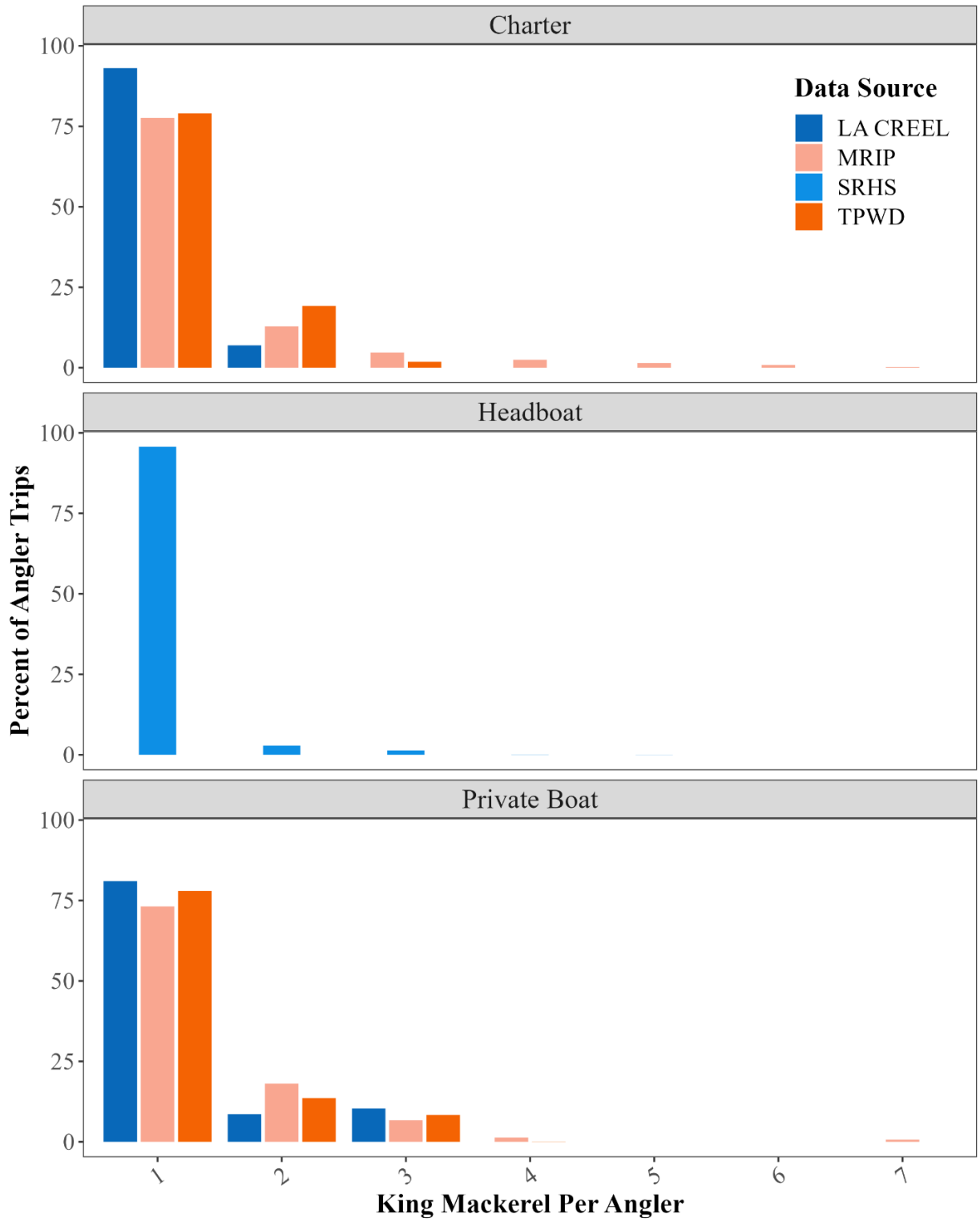

Figure A1. Distribution of Gulf king mackerel harvested per person per day by recreational fishing fleet and dataset. Dockside data aggregated from the 2020/2021 to 2022/2023 fishing years.

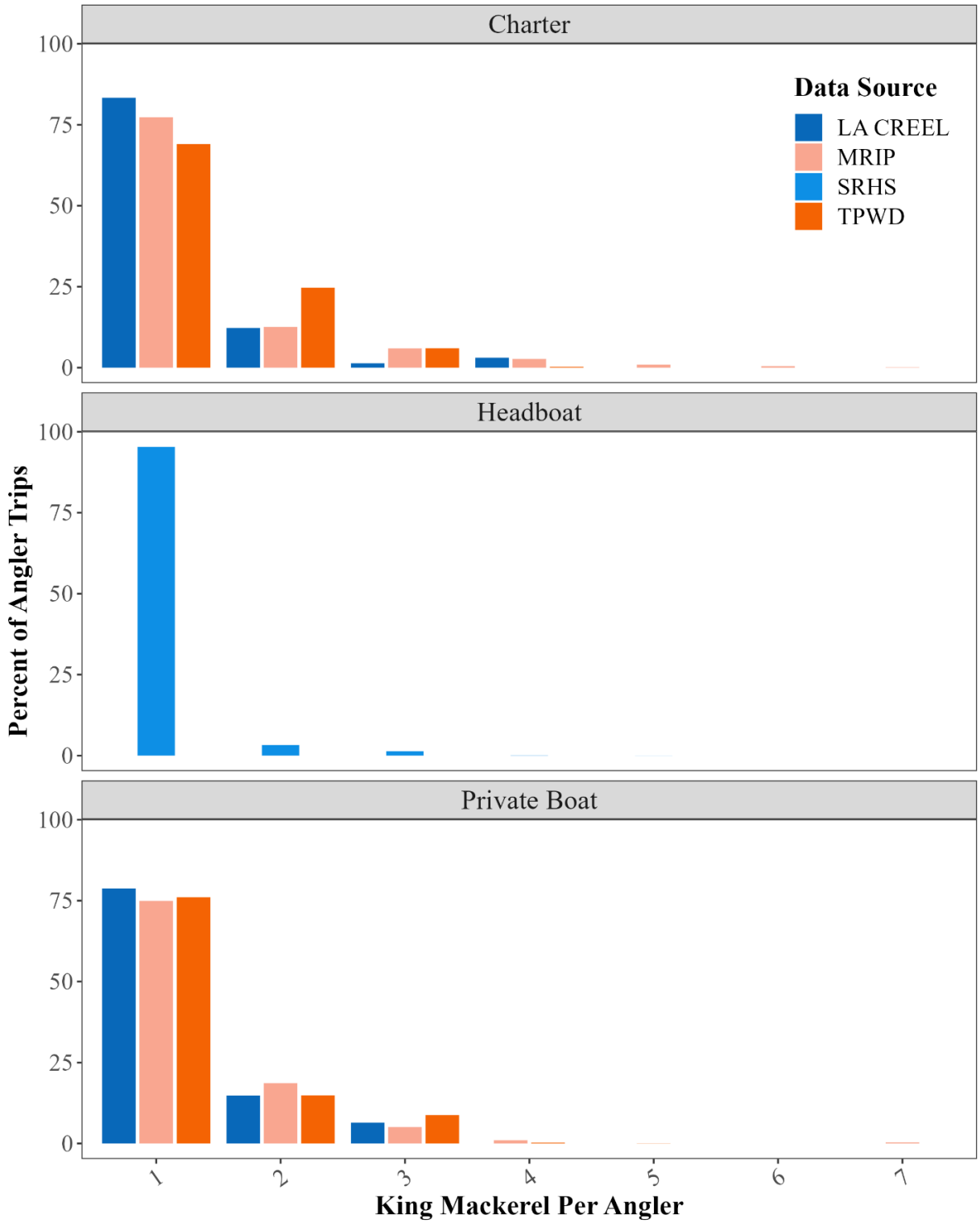

Figure A2. Distribution of Gulf king mackerel harvested per person per day by recreational fishing fleet and dataset. Dockside data aggregated from the 2018/2019 to 2022/2023 fishing years.

To investigate each daily bag limit alternative, a percent reduction in catch was calculated to estimate the decrease in landings that would be associated with each daily bag limit alternative. If an angler's harvest was higher than the proposed alternative, that harvest value was changed to match the maximum harvest allowed by the proposed alternative. For example, when evaluating **Action 2 Alternative 3** (1 fish per person daily bag limit), if an angler trip record indicated harvest of 3 king mackerel, the landing value was changed from 3 to 1 fish to match the maximum allowable harvest for that alternative. The final percent reduction was calculated by dividing the harvest from each alternative by the harvest from the No Action alternative. This process was completed twice, using dockside data from either the last 3 or 5 fishing years to match percent reductions with the proposed ACL time periods (**Table A2** and **A3**). The percent reductions were evaluated at the fleet and data source level to ensure that differences in catch rates were incorporated into the analysis.

Table A2. Proposed recreational daily bag limit alternatives and associated percent reduction for each alternative, by fishing fleet and data source, using dockside data from 2020/2021 to 2022/2023.

Alternatives	Data Source	Private Boat	Charter	Headboat
Alternative 1 (No Action): 3 Fish Daily Bag Limit	LA CREEL	0.0	0.0	0.0
	MRIP	0.0	0.0	0.0
	TPWD	0.0	0.0	0.0
	SRHS	0.0	0.0	0.0
Alternative 2 : 2 Fish Daily Bag Limit	LA CREEL	-13.4	0.0	0.0
	MRIP	-6.8	-16.0	0.0
	TPWD	-11.6	-1.7	0.0
	SRHS	0.0	0.0	-6.9
Alternative 3: 1 Fish Daily Bag Limit	LA CREEL	-36.9	-7.8	0.0
	MRIP	-23.4	-33.9	0.0
	TPWD	-35.2	-17.6	0.0
	SRHS	0.0	0.0	-23.0

Table A3. Proposed recreational daily bag limit alternatives and associated percent reduction for each alternative, by fishing fleet and data source, using dockside data from 2018/2019 to 2022/2023.

Alternatives	Data Source	Private Boat	Charter	Headboat
Alternative 1 (No Action): 3 Fish Daily Bag Limit	LA CREEL	0.0	0.0	0.0
	MRIP	0.0	0.0	0.0
	TPWD	0.0	0.0	0.0
	SRHS	0.0	0.0	0.0
Alternative 2 : 2 Fish Daily Bag Limit	LA CREEL	-7.8	-7.1	0.0
	MRIP	-5.5	-13.6	0.0
	TPWD	-11.0	-4.4	0.0
	SRHS	0.0	0.0	-6.4
Alternative 3: 1 Fish Daily Bag Limit	LA CREEL	-33.6	-24.9	0.0
	MRIP	-20.4	-32.1	0.0
	TPWD	-34.1	-26.8	0.0
	SRHS	0.0	0.0	-22.9

Next, the landing behavior for the last 3 or 5 years was evaluated to determine which time period was most representative of landing behavior (**Figures A3** and **A4**). Gulf king mackerel landings for the most recent fishing year, 2022/2023, were the lowest in recent years. In the four years prior to the 2022/2023 fishing year, the landings were higher and more variable, particularly in Wave 4, when landings of Gulf king mackerel are highest. Final projections were completed using both the average landings for the last 3 or 5 years, to ensure that variability of Gulf king mackerel landings data were evaluated. The 3-year average is representative of more recent behavior, with lower landing rates. The 5-year average represents higher landings rates, encompassing the variable and high landings in Wave 4 or most years. The percent reductions were applied to the average daily landings rates for each fleet and data source to generate daily landings rates associated with each daily bag limit alternative. The fleet averages were then aggregated to generate a sector level daily landing rate for each daily bag limit alternative. The 3 or 5 year projected daily recreational landings were summed cumulatively and compared to each of the proposed ACL values (**Figures A5** and **A6**). No closures were projected for any ACL or daily bag limit alternative when using a 3-year average for daily landings rates. The use of the higher 5-year average resulted in closures for all daily bag limit alternatives with the lowest proposed ACL alternative **(Action 1 Alternative 2 option b**) and for the No Action (3 fish) daily bag limit alternatives for the next two lowest proposed ACL alternatives (**Action 1 Alternative 2 option a** and **Alternative 2 option d, Table A4**). While some closures are projected, these closures tend to be later in the fishing year, particularly for **Action 2 options 2 a** and **d**, reducing the fishing season by approximately 16 days.

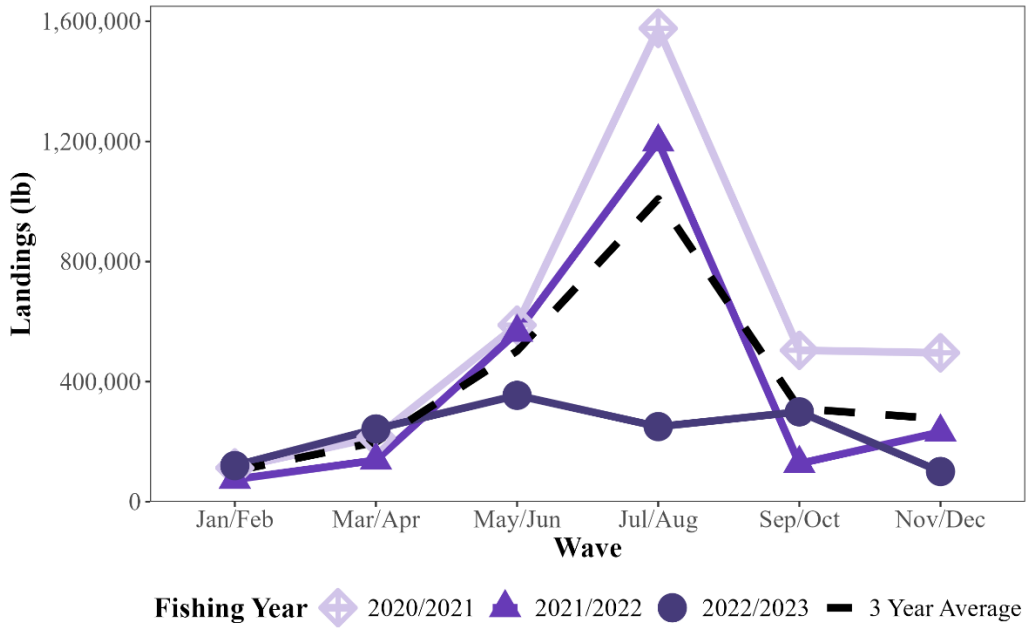

Figure A3. Recreational sector landings of Gulf king mackerel by wave, using MRIP-FES data units, for the last 3 fishing years. Data Source: SEFSC Recreational FES ACL data (Accessed May 6, 2024).

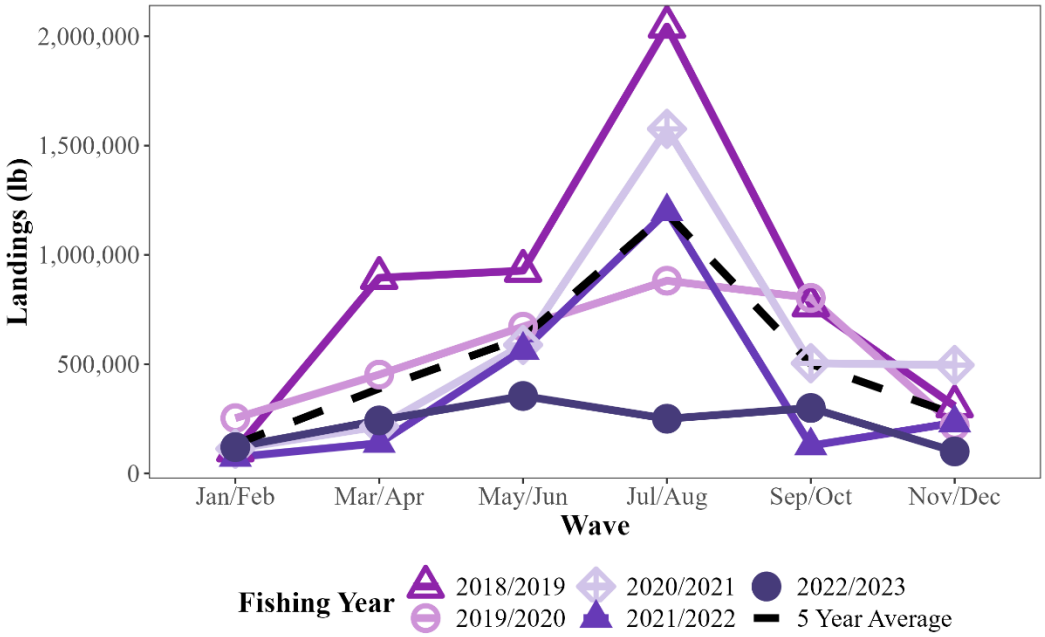

Figure A4. Recreational sector landings of Gulf king mackerel by wave, using MRIP-FES data units, for the last 5 fishing years. Data Source: SEFSC Recreational FES ACL data (Accessed May 6, 2024).

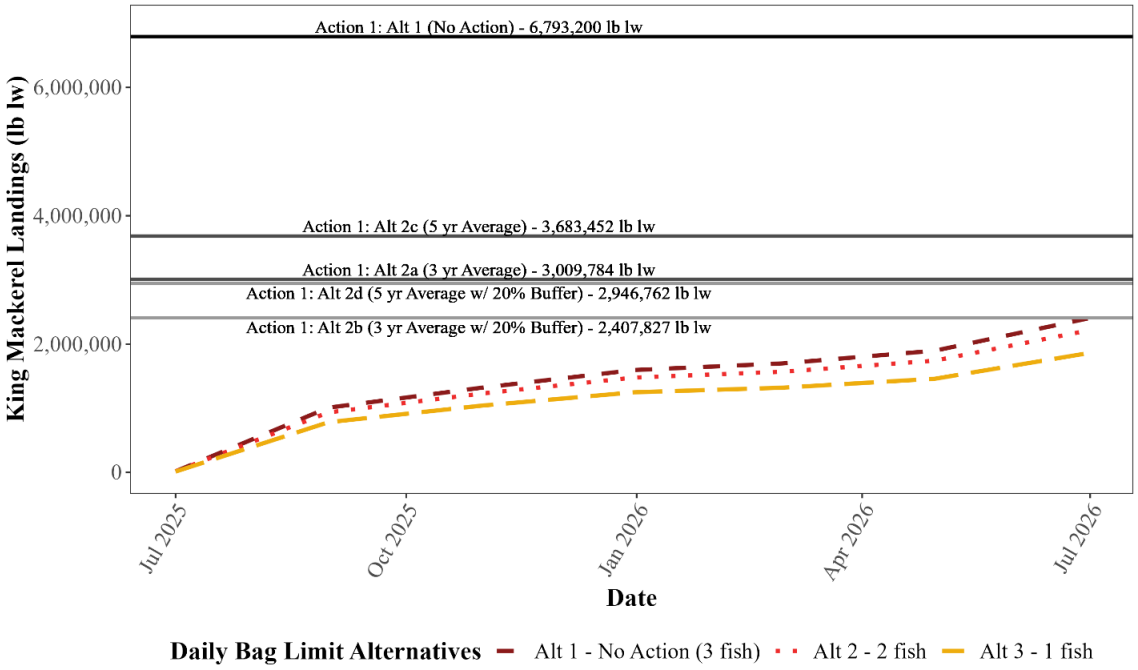

Figure A5. Cumulative sum of projected daily landings for the three daily bag limit alternatives in Action 2. Projected landings are averaged over the 3 most recent fishing years.

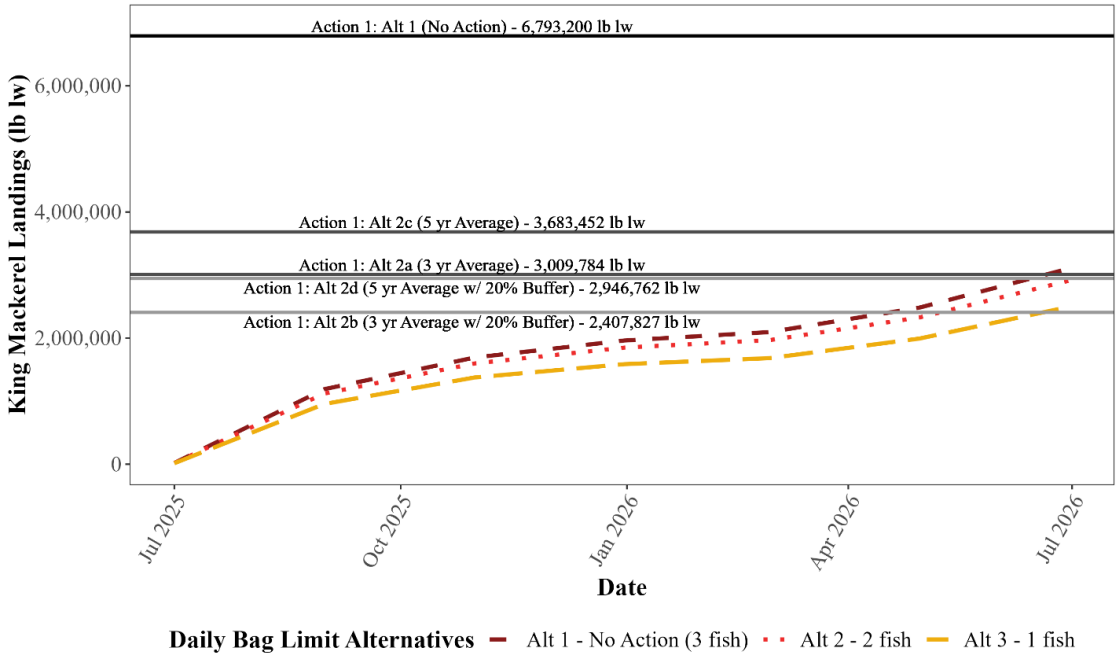

Figure A6. Cumulative sum of projected daily landings for the three daily bag limit alternatives in Action 2. Projected landings are averaged over the 5 most recent fishing years.

Table A4. Predictions for when king mackerel ACLs would be met under the Action 1: Alternatives 1-3. The projected landings used to project closure dates is based on an average of the 3 most recent fishing years. Dashes indicate no closure is projected.

Action 1: Proposed ACL	Action 2: Recreational Daily Bag Limit	ACL Met	Approx. Days
Alternative 1 (No Action): Current ACL 6,793,200 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2a: 3 Year Average 3,009,784 (lb lw)	Alternative 1 (No Action): 3 Fish	-	355
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2b: 3 Year Average w/ 20% buffer 2,407,827 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2c: 5 Year Average 3,683,452 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2d: 5 Year Average w/ 20% buffer 2,946,762 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365

Table A5. Predictions for when king mackerel ACLs would be met under the Action 1: Alternatives 1, 4, and 5. The projected landings used to project closure dates is based on an average of the 5 most recent fishing years. Dashes indicate no closure is projected.

Action 1: Proposed ACL	Action 2: Recreational Daily Bag Limit	ACL Met	Approx. Days
Alternative 1 (No Action): Current ACL 6,793,200 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2a: 3 Year Average 3,009,784 (lb lw)	Alternative 1 (No Action): 3 Fish	21-Jun	355
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2b: 3 Year Average w/ 20% buffer 2,407,827 (lb lw)	Alternative 1 (No Action): 3 Fish	19-Apr	292
	Alternative 2: 2 Fish	9-May	312
	Alternative 3: 1 Fish	20-Jun	354
Alternative 2c: 5 Year Average 3,683,452 (lb lw)	Alternative 1 (No Action): 3 Fish	-	365
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365
Alternative 2d: 5 Year Average w/ 20% buffer 2,946,762 (lb lw)	Alternative 1 (No Action): 3 Fish	15-Jun	349
	Alternative 2: 2 Fish	-	365
	Alternative 3: 1 Fish	-	365