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Changes in Allocations, Stock Boundaries and Sale Provisions for Gulf of Mexico and Atlantic Migratory Groups of King Mackerel

Amendment 26
to the Fishery Management Plan for the Coastal Migratory Pelagics Fishery of the Gulf of Mexico and Atlantic Region

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

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ENVIRONMENTAL ASSESSMENT COVER SHEET

CHANGES IN ALLOCATIONS, STOCK BOUNDARIES AND SALE PROVISIONS FOR GULF OF MEXICO AND ATLANTIC MIGRATORY GROUPS OF KING MACKEREL

Amendment 26 to Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and South Atlantic Region addressing modifications to the management of king mackerel within the coastal migratory pelagic zones; including Environmental Assessment, Fishery Impact Statement, Regulatory Impact Review, and Regulatory Flexibility Act Analysis.

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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
AMs	accountability measures
AP	Advisory Panel
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
CFDBS	Commercial Fisheries Data Base System
CLM	commercial landings monitoring system
CMP	coastal migratory pelagics
Council	Gulf of Mexico and South Atlantic Fishery Management Councils
CS	consumer surplus
CZMA	Coastal Zone Management Act
DQA	Data Quality Act
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	environmental impact statement
EJ	environmental justice
ESA	Endangered Species Act
F	instantaneous rate of fishing mortality
FLEC	Florida east coast
FMP	Fishery Management Plan
Gulf	Gulf of Mexico
Gulf Council	Gulf of Mexico Fishery Management Council
GMFMC	Gulf of Mexico Fishery Management Council
GSMFC	Gulf States Marine Fisheries Commission
HAPC	habitat area of particular concern
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	maximum fishing mortality threshold
Mid-Atlantic Council	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
mp	million pounds
MRFSS	Marine Recreational Fisheries Survey and Statistics
MRIP	Marine Recreational Information Program
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NEFSC	New England Fisheries Science Center
NEPA	National Environmental Policy Act
nm	nautical mile
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOR	net operating revenue

OFL	overfishing level
OY	optimum yield
PS	producer surplus
RFA	Regulatory Flexibility Act of 1980
RIR	Regulatory Impact Review
RQ	regional quotient
SAFMC	South Atlantic Fishery Management Council
SBA	Small Business Administration
SCS	small coastal sharks
Secretary	Secretary of Commerce
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
South Atlantic Council	South Atlantic Fishery Management Council
SSB	spawning stock biomass
SSC	Scientific and Statistical Committee
SPR	spawning potential ratio
SRHS	Southeast Regional Headboat Survey
TLR	trip limit reduction
TPWD	Texas Parks and Wildlife Department
USCG	United States Coast Guard
VOC	volatile organic compound
ww	whole weight

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CHAPTER 1. INTRODUCTION

What Actions Are Being Proposed?
Actions in Amendment 26 to Fishery Management Plan (FMP) for Coastal Migratory Pelagic Resources (CMP) in the Gulf of Mexico and South Atlantic Region (Amendment 26) address issues associated with the king mackerel stock boundary; updates to biological parameters for Gulf of Mexico (Gulf) and Atlantic migratory groups of king mackerel; acceptable biological catch levels for Atlantic migratory group king mackerel; annual catch limits (ACL) for Gulf and Atlantic migratory groups of king mackerel; zone commercial quotas for Gulf migratory group king mackerel; recreational and commercial allocation of Gulf migratory group king mackerel; bag limits for recreationally caught Gulf migratory group king mackerel; sale of incidental catch of Atlantic migratory group king mackerel in the small coastal shark drift gillnet fishery; and management measures for commercial harvest of Atlantic migratory group king mackerel in Atlantic Southern Zone.

Who's Who?

- ***Gulf of Mexico*** and ***South Atlantic Fishery Management Councils*** – Engage in a process to determine a range of actions and alternatives, and recommends action to the National Marine Fisheries Service.
- ***National Marine Fisheries Service*** and ***Council staffs*** – Develop alternatives based on guidance from the Council, and analyze the environmental impacts of those alternatives.
- ***Secretary of Commerce*** – Will approve, disapprove, or partially approve the amendment as recommended by the Councils.

Who Is Proposing the Action?
The Gulf and South Atlantic Fishery Management Councils (Councils) are proposing the actions. The Councils develop the regulations and submit them to the National Marine Fisheries Service (NMFS) who ultimately approves, disapproves, or partially approves the actions in the amendment on behalf of the Secretary of Commerce. NMFS is an agency in the National Oceanic and Atmospheric Administration (NOAA).

Why Are The Councils Considering Action?
In 2014, a stock assessment of the Atlantic and Gulf migratory groups of king mackerel was completed (SEDAR 38), and indicated that neither migratory group was overfished or experiencing overfishing. In addition to revised yield streams, the stock assessment redefined the spatial and temporal extent of the mixing zone between the migratory groups to be only south of the Florida Keys during winter months. The stock assessment also redefined the geographic boundary between the migratory groups to be at the Dade/Monroe County line. These findings eliminate one of the commercial allocation zones for the Gulf migratory group, and will require reallocation of the commercial sector's portion of the ACL amongst the remaining Gulf commercial zones. The change in the range of the migratory groups will also require development of management measures for the newly assigned portion of the Atlantic migratory group along the east coast of Florida, which will be part of the Atlantic Southern Zone.

Historically, the recreational sector in the Gulf has not landed its allocation of the king mackerel ACL (currently 68%), while the commercial sector has either met or exceeded its allocation (32%). In an effort to manage Gulf king mackerel such that the maximum benefit of the resource is extracted without harming the population, the Councils have decided to evaluate reallocation of Gulf king mackerel from the recreational sector to the commercial sector and changes to the recreational bag limit.

In addition to ACL and stock boundary issues, the Councils are interested in evaluating whether to implement a provision to allow persons prosecuting the South Atlantic shark drift gillnet fishery to keep incidental caught king mackerel. The Councils placed restrictions on sale of king and Spanish mackerel caught under the recreational bag limit in CMP Amendment 20A (GMFMC and SAFMC 2013), which was implemented July 2014. Allowing sale of incidental catch of king mackerel would re-establish a historic practice and reduce waste in the Atlantic king mackerel fishery and Atlantic shark gillnet fishery.

1.1 Background

Initially, the CMP FMP (GMFMC and SAFMC 1982) treated king mackerel as one stock. The present management regime in the FMP recognizes two migratory groups: the Gulf migratory group and the Atlantic migratory group. Each migratory group is primarily managed by the respective Council, with the exception of the Florida East Coast Subzone. Gulf and Atlantic migratory groups of king mackerel are also divided into zones and/or subzones for management purposes. This amendment considers changes to management measures for Gulf and Atlantic migratory groups of king mackerel. For the purposes of this amendment, the Gulf migratory group will be referred to as *Gulf king mackerel* and the Atlantic migratory group will be referred to as *Atlantic king mackerel***.**

To simplify the nomenclature for identifying commercial fishing zones in the Gulf, the current names of the zones will be changed to read as follows:

Old Zone Name	New Zone Name
Western Zone	Western Zone
Florida West Coast Northern Subzone	Northern Zone
Florida West Coast Southern Subzone	Southern Zone

The two migratory groups were historically thought to mix seasonally off the east coast of Florida and in Monroe County, Florida. For management and assessment purposes, a boundary between the migratory groups of king mackerel was specified at the Volusia/Flagler County border on the Florida east coast in the winter (November 1 - March 31) and the Monroe/Collier County border on the Florida southwest coast in the summer (April 1 - October 31) (Figure 1.1.1).

In 2014, a stock assessment was completed for Gulf and Atlantic migratory group king mackerel (SEDAR 38). Based on the research highlighted in the assessment, the assessment scientists determined that the mixing zone was substantially smaller than originally thought. The mixing zone is now considered to be only the portion of the exclusive economic zone off Monroe

County, Florida, south of the Florida Keys. The stock assessment also generated updated stock benchmarks and yield projections, which requires the Councils to update benchmarks (if necessary) and to update ACLs (as appropriate).

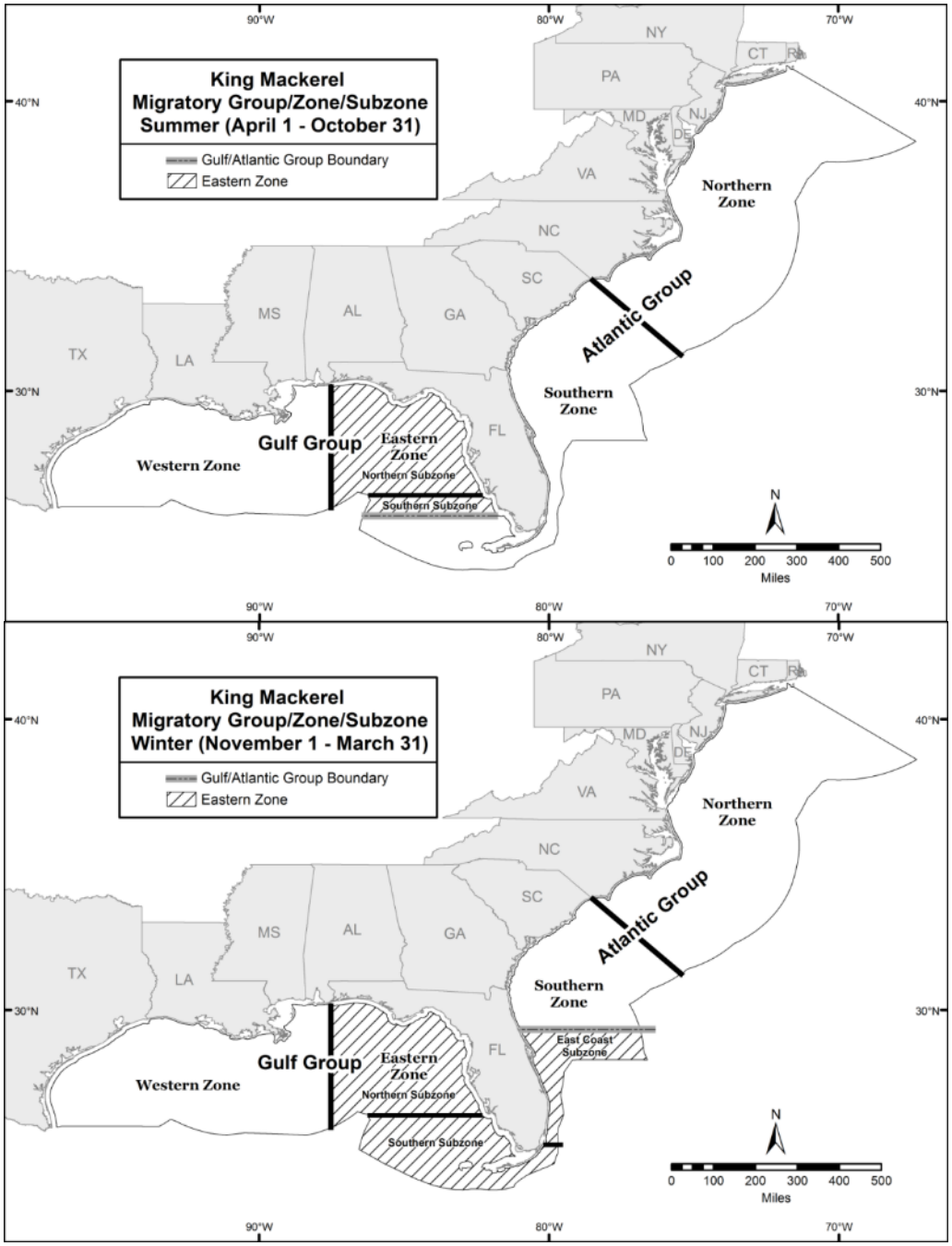

Figure 1.1.1. Current seasonal boundary between Atlantic and Gulf migratory groups of king mackerel.

The Gulf Florida East Coast Subzone is currently one of the Gulf king mackerel commercial management zones, with king mackerel taken from this area counting against the Gulf commercial ACL during winter (November through March). However, because of new stock and management boundaries recommended in the stock assessment, this area would be included within the Atlantic Southern Zone for the commercial sector, with the respective landings counting towards the Atlantic Southern Zone commercial quota. For the recreational sector, the area would be included within the entire jurisdiction of the South Atlantic Council for Atlantic king mackerel management, with landings counting towards the Atlantic king mackerel recreational ACL.

Prior to Amendment 20A to the CMP FMP (GMFMC and SAFMC 2013a), fishermen with both federal commercial shark and king mackerel permits could sell the bag limit of king mackerel incidentally caught on shark gillnet trips. Amendment 20A prohibited sale of king mackerel harvested under the bag limit in South Atlantic Fishery Management Council (South Atlantic Council) jurisdictional waters, and the prohibition of gillnet gear for harvesting king mackerel in the South Atlantic currently prevents incidentally harvested king mackerel from being sold. The Councils are considering allowing participants in the commercial shark gillnet fishery in the South Atlantic to retain and sell some amount of incidental catch of Atlantic king mackerel.

In the Gulf, the commercial zone allocations will need to be re-evaluated with the potential removal of the East Coast Subzone from the Gulf migratory group ACL. This would require reallocation amongst the three remaining Gulf commercial fishing zones (Western Zone, Northern Zone, and Southern Zone).

The Councils are considering modifying the sector allocations for Gulf migratory group king mackerel. Over the past decade, the commercial sector has regularly met or exceeded the commercial ACL while the recreational sector has landed low proportions of the recreational ACL. At the March 2015 Gulf CMP Advisory Panel (Gulf AP) meeting, members recommended that the Councils abstain from reallocating any king mackerel from the recreational sector to the commercial sector. The Gulf AP subsequently recommended an increase for the Gulf recreational bag limit as a way to potentially increase utilization of the Gulf recreational ACL.

1.2 Purpose and Need

Purpose for Action

The purpose of this amendment is to modify the stock boundary and revise the ACLs for Atlantic and Gulf migratory group king mackerel; to modify the commercial zone quotas for Gulf migratory king mackerel; to review recreational and commercial allocations for Gulf migratory king mackerel; to increase the recreational bag limit for Gulf migratory king mackerel; to create an incidental catch allowance of Atlantic migratory king mackerel for the shark gillnet fishery; and to revise or create management measures for Atlantic migratory group king mackerel in the Atlantic Southern Zone.

Need for Action

The need for this amendment is to ensure annual catch limits are based on the best scientific information available and to ensure overfishing does not occur in the coastal migratory pelagics (CMP) fishery, while increasing social and economic benefits of the CMP fishery through sustainable and profitable harvest of king mackerel 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), was approved in 1982 and implemented by regulations effective in February 1983 (GMFMC and SAFMC 1982). The management unit includes king mackerel, Spanish mackerel, and cobia. The FMP treated king and Spanish mackerel as unit stocks in the Atlantic and Gulf. The following is a list of management changes relevant to this amendment. A full history of CMP management can be found in Amendment 18 to the CMP FMP (GMFMC and SAFMC 2011), and is incorporated here by reference.

Amendment 1, with EIS implemented in September 1985, recognized separate Atlantic and Gulf migratory groups of king mackerel. The Gulf commercial allocation for king mackerel was divided into Eastern and Western Zones for the purpose of regional allocation, with 69% of the allocation provided to the Eastern Zone and 31% to the Western Zone.

Amendment 5, with environmental assessment (EA), implemented in August 1990, extended the management area for Atlantic migratory groups of mackerels through the Mid-Atlantic Council's area of jurisdiction; provided that the South Atlantic Council will be responsible for pre-season adjustments of total allowable catch and bag limits for the Atlantic migratory groups of mackerels while the Gulf of Mexico Fishery Management Council will be responsible for Gulf migratory groups; and continued to manage the two recognized Gulf migratory groups of king mackerel as one until management measures appropriate to the eastern and western migratory groups could be determined.

Amendment 6, with EA, implemented in November 1992, allowed for Gulf migratory group king mackerel stock identification and allocation when appropriate.

Amendment 7, with EA, 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 net gear users.

Amendment 8, with EA, implemented in March 1998, provided the South Atlantic Council with authority to set vessel trip limits, closed seasons or areas, and gear restrictions for Gulf migratory group king mackerel in the North Area of the Eastern Zone (Dade/Monroe to Volusia/Flagler County lines); and modified the seasonal framework adjustment measures.

Amendment 9, with EA, implemented in April 2000, created north and south subzones on the Florida west coast and reallocated the commercial portion of the total allowable catch among the Gulf zones.

Amendment 18, with EA, implemented in January 2012, established ACLs and accountability measures for Gulf and Atlantic migratory groups of king mackerel. The ACLs for the Gulf and Atlantic migratory groups of king mackerel were 10.8 million pounds and 10.46 million pounds, respectively.

Amendment 20A, with EA, implemented in July 2014, prohibited sale of recreationally caught king mackerel, with an exception for sale of fish caught on for-hire trips on dually permitted vessels in the Gulf region, and an exception for sale of fish caught in state-permitted tournaments in both regions.

Amendment 20B, with EA, implemented in March 2015, revised Gulf king mackerel hook and line trip limits in the Florida West Coast zone Northern and Southern subzones and modified the Northern subzone fishing year; created a transit provision for areas closed to king mackerel; established Northern and Southern zones with commercial quotas for Atlantic king mackerel.

Amendment 23, with EA, implemented in August 2014, was part of the joint Gulf/ South Atlantic Dealer Reporting Amendment, and required CMP fishermen to sell to a federally permitted dealer.

South Atlantic CMP Framework Action 2013 with EA, implemented in December 2014, modified king mackerel trip limits in the Gulf Florida East Coast subzone.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 – Adjust the Management Boundary for Gulf of Mexico (Gulf) and Atlantic Migratory Groups of King Mackerel

Alternative 1: No Action - Maintain the current shifting management boundary between the Gulf and Atlantic migratory groups of king mackerel (**Figure 2.1.1**).

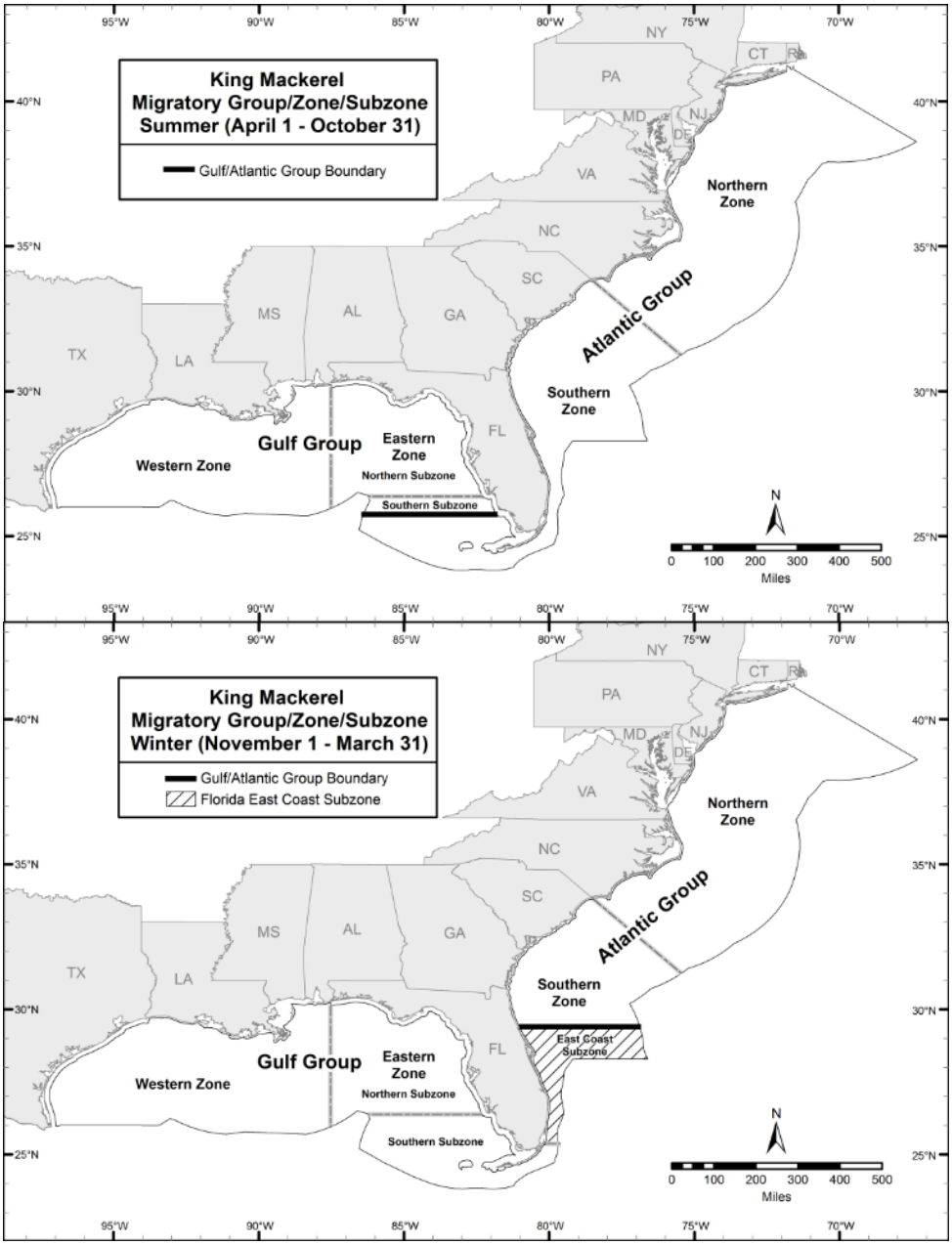

Figure 2.1.1. Alternative 1: Current seasonal management boundaries for Atlantic and Gulf migratory groups of king mackerel.

Alternative 2: Establish a single year-round boundary for separating management of the Gulf and Atlantic migratory groups of king mackerel at the regulatory boundary between the Gulf and South Atlantic Fishery Management Councils (Councils) (**Figure 2.1.2**). The South Atlantic Fishery Management Council (South Atlantic Council) would be responsible for management measures in the mixing zone.

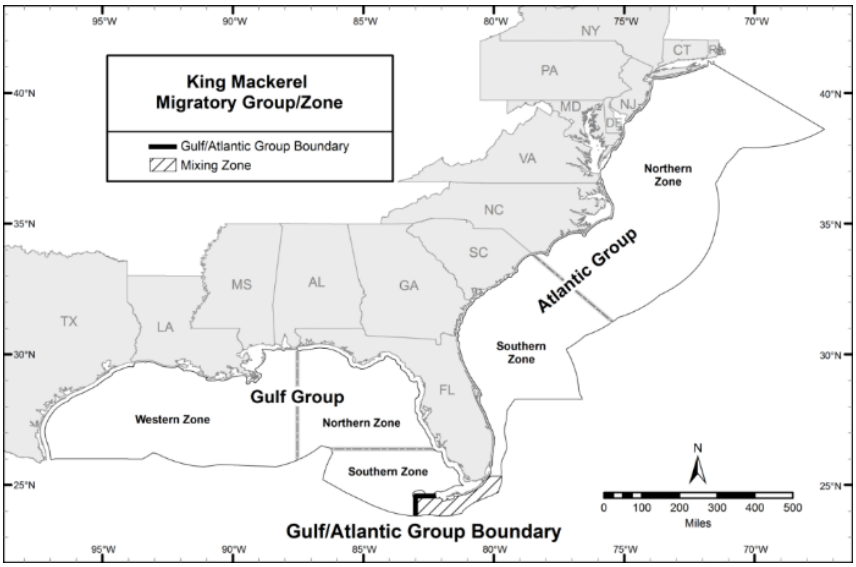

Figure 2.1.2. Alternative 2: Proposed management boundary for Atlantic and Gulf migratory groups of king mackerel.

Preferred Alternative 3: Establish a single year-round boundary for separating the Gulf and Atlantic migratory groups of king mackerel at the Miami-Dade/Monroe county line (**Figure 2.1.3**). The Gulf of Mexico Fishery Management Council (Gulf Council) would be responsible for management measures in the mixing zone.

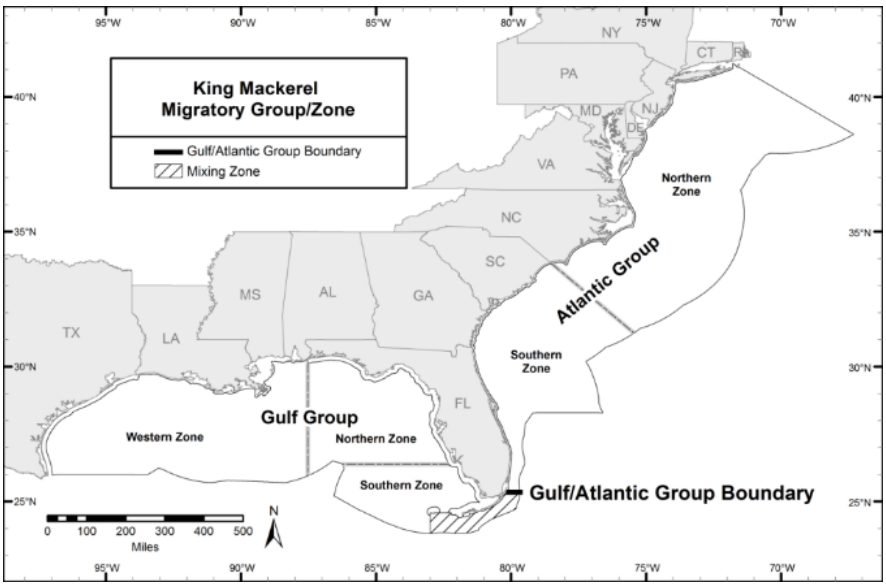

Figure 2.1.3. Preferred Alternative 3: Proposed management boundary for Atlantic and Gulf groups of king mackerel.

Discussion:

Separate Gulf and Atlantic migratory groups of king mackerel were first recognized in Amendment 1 to the Fishery Management Plan (FMP) for Coastal Migratory Pelagic Resources (CMP) in the Gulf of Mexico and Atlantic Region (GMFMC and SAFMC 1985). The shifting management boundary was established to account for winter mixing between the two migratory groups. The mixing zone designation was supported at the time by tag-recapture data. Amendment 7 to the CMP FMP (GMFMC and SAFMC 1994) established a separate quota for the mixing zone, then called the North Area of the Gulf migratory group, and Amendment 8 to the CMP FMP (GMFMC and SAFMC 1996) provided the South Atlantic Fishery Management Council (South Atlantic Council) with authority to set management measures for Gulf migratory group king mackerel in that area. The Gulf of Mexico Fishery Management Council (Gulf Council) established the current Gulf migratory group zones and subzones in Amendment 9 to the CMP FMP (GMFMC and SAFMC 2000). The Gulf East Coast Subzone was designed to encompass the area believed to be the mixing zone in winter.

In 2014, a stock assessment was completed for Gulf and Atlantic migratory group king mackerel (SEDAR 38 2014). Based on tagging, population demographics, population genetics, and otolith shape and chemistry, plus the temporal progression of king mackerel recreational landings along the east coast of Florida, the assessment scientists determined that the mixing zone was substantially smaller than originally thought. The mixing zone is now considered to be only the portion of the exclusive economic zone (EEZ) off Monroe County, Florida, south of the Florida Keys (Keys). This area is demarcated in the west by a line west from Key West to the Dry Tortugas at 24°35' North latitude, then south at 83º West longitude from the Dry Tortugas (the Gulf /South Atlantic Council boundary) to the shelf edge. The area is demarcated in the east by a line east from the Miami-Dade/Monroe county line at 25°20'24" North latitude to the shelf edge (Figure 2.1.4).

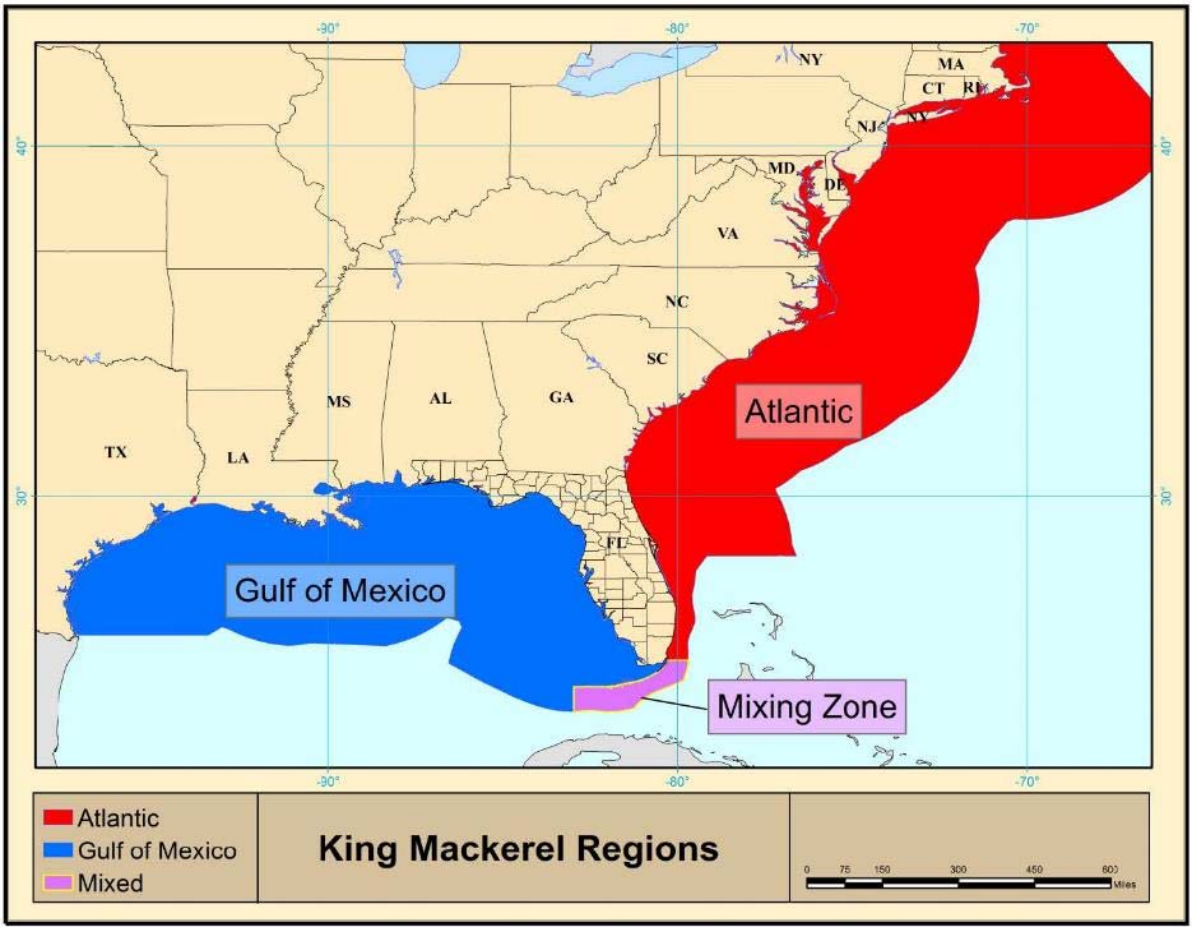

Figure 2.1.4. Areas of Gulf and Atlantic migratory king mackerel and the mixing zone as defined by SEDAR 38 (2014).

Alternative 1 would maintain the current shifting management boundary. From April 1 through October 31, the boundary is at the Collier/Monroe county line and all king mackerel along the east coast of Florida and the Keys are considered to be part of the Atlantic migratory group. Beginning November 1 through March 31, the boundary shifts to the Volusia/Flagler county line, and all king mackerel from that boundary south are considered to be part of the Gulf migratory group (Figure 2.1.1). This is in conflict with the new information from the stock assessment (SEDAR 38 2014) that king mackerel off the east coast of Florida to the Dade/Monroe county line are Atlantic migratory group fish year-round. Only the area south of the Keys (in Monroe County) contains 50% Gulf migratory group king mackerel in winter.

Alternative 2 would establish a year-round (non-shifting) management boundary at the Gulf/South Atlantic Council boundary off the western end of the Keys and Dry Tortugas (Figure 2.1.2). This alternative would designate the area of the EEZ north of the Keys in the Gulf Council's jurisdiction and the area of the EEZ south of the Keys in the South Atlantic Council's jurisdiction; therefore, the entire mixing zone would be in the South Atlantic Council's jurisdiction year-round. The current management for the Atlantic Southern Zone (seasons, quotas, trip/bag limits, and accountability measures) would apply to the mixing zone, unless otherwise changed (see Action 5).

Establishing a permanent management boundary would simplify regulations as they would stay the same throughout the region all year; however, splitting management between the Councils in the Keys would create additional complications. In particular, management of the king mackerel gillnet component of the fishery, which primarily occurs west and northwest of Monroe County, would be split between the Councils. This small group of fishermen (17 permits total) would be more efficiently managed as a single group. Further, run-around gillnets are not legal gear for king mackerel in the South Atlantic, so gear regulations would need to be changed to accommodate this component of the fishery. At their March 2015 meeting, the South Atlantic Council acknowledged these issues, and difficulties with enforcement relative to **Alternative 2**.

Preferred Alternative 3 would also establish a year-round management boundary, but at the Dade/Monroe County line (Figure 2.1.3). This alternative would put the entire EEZ off the Keys in the Gulf Council's jurisdiction as part of the Gulf Southern Zone. Currently, the Keys are part of the Gulf Southern Zone in the winter and management for the gillnet and hook-and-line components is well established; this management could be extended throughout the year without additional action. Also, the management boundary for Spanish mackerel is at the Dade/Monroe county line, so enforcement and compliance would be more streamlined and complexity would be reduced.

Preferred Alternative 3 would not change the current federal fishing permits requirements for fishing in the Gulf and Atlantic areas as defined in federal regulations. The federal commercial king mackerel fishing vessel permit covers fishing in the Gulf, South Atlantic, and Mid-Atlantic (federal waters off Texas to New York). However, two separate federal CMP charter/headboat permits are issued: one covers fishing for king mackerel, Spanish mackerel, and cobia in the Gulf, and one covers fishing for king mackerel, Spanish mackerel, and cobia in the South Atlantic and Mid-Atlantic. The area in which each permit is required is defined by the boundary between the Gulf and South Atlantic Council as described in the federal regulations (50 CFR 600.105(c) and described above). Therefore, although **Preferred Alternative 3** would allow the Gulf Council to enact management measures that apply in the EEZ off the entire Keys, the Atlantic CMP charter/headboat permit would still be required to fish for CMP species in the South Atlantic EEZ south of the Keys. This Atlantic CMP charter/headboat permit is open access and available to fishermen through the NMFS Southeast Region Permits Office.

Further, the current prohibition on the sale of recreationally caught CMP species, and its exemptions, would not change with **Preferred Alternative 3.** The exemptions allow sale of CMP species harvested during state licensed tournaments (with specific requirements) and sale of CMP species harvested in the Gulf on board a vessel with both a federal commercial king (or Spanish) mackerel permit and a federal Gulf CMP charter/headboat permit. Thus, only king mackerel harvested on a recreational trip in the Gulf EEZ (north of the Keys) are subject to the exemption. Thus, no sale of recreationally harvested king mackerel from the South Atlantic EEZ (south of the Keys) would be allowed, unless the tournament exemption applies.

With either **Alternative 2** or **Preferred Alternative 3**, the East Coast Subzone for the Gulf migratory group would no longer exist. That area would be completely within the range of the Atlantic migratory group, and would be managed year-round by the South Atlantic Council as part of the Atlantic Southern Zone. As such, the highlighted language below would be unnecessary and removed from the framework procedure:

Responsibilities of Each Council:

1. *Recommendations with respect to the Atlantic migratory groups of king mackerel, Spanish mackerel, and cobia will be the responsibility of the South Atlantic Council, and those for the Gulf migratory groups of king mackerel, Spanish mackerel, and cobia will be the responsibility of the Gulf Council, with the following exceptions:*

The South Atlantic Council will have responsibility to set vessel trip limits, closed seasons or areas, or gear restrictions for:

a. *The Eastern Zone - East Coast Subzone for Gulf migratory group king mackerel*
b. *The east coast of Florida including the Atlantic side of the Florida Keys for Gulf migratory group cobia.*

Council Conclusions:

The Councils' respective Scientific and Statistical Committees (SSCs) reviewed the SEDAR 38 (2014) stock assessments of Gulf and Atlantic migratory groups of king mackerel, and determined the conclusions regarding the stock boundaries and newly delineated winter mixing zone to be accurate. Since the Gulf Council already manages Spanish mackerel and cobia to the Dade/Monroe County line, the Councils decided that managing king mackerel to the same boundary was the most appropriate option to simplify regulatory compliance and enforcement. Doing so also allows the continued operation of the gillnet component of the commercial king mackerel fishery in the Gulf; gillnets are not a permissible gear for the directed harvest of king mackerel in federal waters in the jurisdiction of the South Atlantic Council.

2.2 Action 2 – Update Reference Points and Revise the Annual Catch Limit (ACL) and Recreational Annual Catch Target (ACT) for Atlantic Migratory Group King Mackerel

The South Atlantic Council has determined that the value for maximum sustainable yield (MSY) is the value of yield at F_{MSY} (fishing mortality at MSY) from the most recent stock assessment. Currently MSY = 10.4 million pounds (mp) (SEDAR 16 2009). In October 2014, the South Atlantic Council's Scientific and Statistical Committee (SSC) recommended a proxy for MSY at 30% SPR (spawning potential ratio), which is 12.7 mp.

The South Atlantic Council has determined that the value for minimum stock size threshold (MSST) is the value from the most recent stock assessment. Currently MSST = 1,827.5 million hydrated eggs (SEDAR 16). Based on the SEDAR 38 assessment, MSST = 1,991 million hydrated eggs. The South Atlantic Council has determined that the value for maximum fishing mortality threshold (MFMT) is the value of F_{MSY} or proxy from the most recent stock assessment. Currently MFMT = F_{MSY} = $F_{30\%SPR}$ = 0.256 (SEDAR 16). Based on the SEDAR 38 assessment, MFMT = F_{MSY} = $F_{30\%SPR}$ = 0.157.

Table 2.2.1. Recommendations from the October 2014 South Atlantic SSC meeting for Atlantic king mackerel.

Criteria	Deterministic
Overfished evaluation	No, SSB/SSB30%SPR= 1.86
Overfishing evaluation	No, F/F30%SPR = 0.17
MFMT	F30%SPR = 0.157
SSB30%SPR (unit)	2,372 million eggs
MSST (unit)	1,991 million eggs
MSY	12.7 mp
ABC Control Rule Adjustment	17.5%
P-Star	32.5%

Note: See the CMP Fishery Management Plan (GMFMC and SAFMC 1982) and Amendment 18 (GMFMC and SAFMC 2011) for more information about the biological parameters in this action.

The South Atlantic SSC provided the following overfishing levels (OFLs) for Atlantic king mackerel at their October 2014 meeting based on SEDAR 38 (Table 2.2.2).

Table 2.2.2. Recommendation for OFL from the October 2014 South Atlantic SSC meeting for Atlantic king mackerel.

Fishing year	OFL (million pounds whole weight)
2016/17	19.8
2017/18	18.3
2018/19	16.7
2019/20	15.2

2.2.1 Action 2-1 – Revise the Acceptable Biological Catch (ABC) for Atlantic Migratory Group King Mackerel

Alternative 1: No Action - Retain the current ABC for Atlantic king mackerel (10.46 mp).

Preferred Alternative 2: Revise the ABC for Atlantic king mackerel for 2016/17 through 2019/20 based on the ABC levels recommended by the SSC for ABC under a high recruitment scenario.

Alternative 3: Revise the ABC for Atlantic king mackerel for 2016/17 through 2019/20 based on the ABC levels recommended by the SSC for ABC under a medium recruitment scenario.

Alternative 4: Revise the ABC for Atlantic king mackerel for 2016/17 through 2019/20 based on the ABC levels recommended by the SSC for ABC under a low recruitment scenario.

Table 2.2.1.1. ABC recommendations from the October 2014 South Atlantic SSC meeting for Atlantic king mackerel. ABC recommendations are in million pounds whole weight.

P*[1]= 0.325	ABC HIGH	ABC MED	ABC LOW	Buffer between ABC and OFL		
Fishing year	**Pref Alt 2**	**Alt 3**	**Alt 4**	HI	MED	LO
2016/17	17.4	16.5	15.4	12%	16%	22%
2017/18	15.8	14.3	12.9	14%	22%	29%
2018/19	14.1	12.9	11.9	15%	23%	28%
2019/20	12.7	12.1	11.6	17%	21%	24%

[1] P* refers to the probability for overfishing to occur at the harvest level. For example, when the SSC requests projections for P*=50%, the SEFSC provides projections for landings that are expected to result in only a 50% probability of causing overfishing of the stock.

Discussion

Amendment 18 to the CMP FMP (GMFMC/SAFMC 2011) established an ABC control rule for Atlantic group king mackerel, which set the ABC at 10.46 million pounds (mp). The South Atlantic SSC reviewed the results of SEDAR 38 in October 2014 and provided the following recommendations for the ABC:

The [South Atlantic] *SSC recommends short-term projections (given the high uncertainty in recruitment, even in the short-term) of no longer than 5-years at P*=50% for OFL and at P*=32.5% for ABC. Further, given the considerable uncertainty associated with recruitment in this assessment, the* [South Atlantic] *SSC recommended the Council consider a range of alternative projection scenarios for OFL and ABC:*

1. Three sets of projections as specified in the paragraph above but with each considering one of the 3 recruitment scenarios described in the assessment report (i.e., high, medium, and low recruitment). The [South Atlantic] *Committee also recommends the Council be provided a summary of the 2013 and, if possible, 2014 SEAMAP juvenile index data to assist in evaluating which recruitment scenario is the most appropriate for projections.*

2. The [South Atlantic] *SSC recommends the Council use a projection at the long-term, equilibrium yield at* $F_{30\%SPR}$ *as the ACL to reduce the risk of overfishing given the high uncertainty in future recruitment.*

The [South Atlantic] *SSC recommends a review of updated indices and input data sources every 3 years in order to track the progress of the stock and help identify any potential red flags regarding future recruitment or stock biomass.*

The [South Atlantic] *SSC recommended that the next assessment be conducted as an update, ideally before the end of the 5-year projections.*

The South Atlantic SSC's decision to provide a range of OFL and ABC values based on a high, medium, or low recruitment scenario is a different approach than has been used for other stocks. South Atlantic Council members who participated in SEDAR 38 urged the South Atlantic SSC to consider an approach that would incorporate flexibility into the process to set the ABC and ACL for Atlantic king mackerel so as to better align with the dynamics of the stock. Historic catch data over several decades reflect cyclical variations in landings. Periods of high landings do not automatically indicate or result in overfishing or negative effects on the Atlantic king mackerel stock; likewise, periods of low landings do not necessarily indicate that the stock is in decline. These cyclical periods of high and low landings are most likely characteristic of the stock's variable productivity. Directly relating variations in landings to either high or low recruitment may disregard other environmental data or fishery-related circumstances.

By providing a range of OFL and ABC values for Atlantic king mackerel, the South Atlantic SSC recommendations will allow the Councils to apply adaptive management to Atlantic king mackerel but still maintain catch below the recommended OFL. This predetermined flexibility will allow the Councils to adjust ABC values, if needed, as new information regarding stock productivity and recruitment becomes available, without having to wait for the next stock assessment. The South Atlantic SSC also recommended using a "rumble-strip approach," in which the South Atlantic SSC will review indices of abundance and projections on a regular basis. Such an approach will allow the South Atlantic SSC to identify "red flags" that may indicate a need to adjust ABC levels.

Alternative 1 (No Action) would not update the ABC values for Atlantic king mackerel based on the outcomes of the recent stock assessment. **Alternatives 2 (Preferred), 3,** and **4** allow the Councils to consider additional information about recruitment when setting the ABC for Atlantic king mackerel, with the option to set the ABC values based on a high **(Preferred Alternative 2)**, medium **(Alternative 3)**, or low **(Alternative 4)** recruitment scenario. Because king mackerel is a dynamic stock and has historically experienced fluctuations in landings, the Councils may want to consider factors that could affect recruitment. Information to consider may include

environmental factors, more recent data through trip tickets or independent surveys, and reports from fishermen about numbers and sizes of king mackerel.

Public comment during scoping meetings and the South Atlantic Advisory Panel (South Atlantic AP) recommended the ABC under the high recruitment scenario (**Preferred Alternative 2**). Information on trip data after the cut-off dates for SEDAR 38 suggest recruitment may be more substantial than indicated by SEDAR 38 models. Additionally, there have been no hurricanes in recent years, and fishermen report seeing large numbers of smaller fish. The South Atlantic AP also recommended reviewing landings after two years to evaluate if the high recruitment scenario was appropriate.

Council Conclusions:

Public input and recommendations from both Councils' APs supported selecting Alternative 2. Anecdotal information suggests that there is a large new cohort of Atlantic migratory group king mackerel, and recent Southeast Area Monitoring and Assessment Program (SEAMAP) data have corroborated this reported increase in juveniles. Combined with a healthy stock status determination from the SEDAR 38 stock assessment, the Councils determined that Alternative 2 represented the most appropriate ABC level for Atlantic migratory group king mackerel.

2.2.2 Action 2-2 – Revise ACLs, Commercial Quotas, and Recreational ACT for Atlantic Migratory Group King Mackerel

Alternative 1: No action - Retain the ACL and recreational ACT for Atlantic king mackerel based on the previous ABC. ACL = optimum yield (OY) = ABC.

Preferred Alternative 2: Revise the ACL and recreational ACT based on the ABC levels selected under Action 2-1. ACL = OY = ABC, recreational ACT = [0.5 or (1-PSE), whichever is greater].

Table 2.2.2.1. Possible outcomes under Alternative 2 based on alternatives in Action 2-1. The recreational allocation is 62.9% and the commercial allocation is 37.1%. For the commercial ACL, the Northern Zone allocation is 23.04% and the Southern Zone allocation is 76.96% (see Appendix E for details on how the Northern and Southern Zone quota allocations were recalculated using the SEDAR 38 boundary).

ACL = ABC HIGH Recruitment Scenario **Action 2-1, Alt 2**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	17.4 mp	6.5 mp	1,497,600	5,002,400	10.9 mp	10.1 mp
2017/18	15.8 mp	5.9 mp	1,359,360	4,540,640	9.9 mp	9.2 mp
2018/19	14.1 mp	5.2 mp	1,198,080	4,001,920	8.9 mp	8.3 mp
2019/20	12.7 mp	4.7 mp	1,082,880	3,617,120	8.0 mp	7.4 mp
ACL = ABC MEDIUM Recruitment Scenario **Action 2-1, Alt 3**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	16.5 mp	6.1 mp	1,405,440	4,694,560	10.4 mp	9.7 mp
2017/18	14.3 mp	5.3 mp	1,221,120	4,078,880	9.0 mp	8.4 mp
2018/19	12.9 mp	4.8 mp	1,105,920	3,694,080	8.1 mp	7.5 mp
2019/20	12.1 mp	4.5 mp	1,036,800	3,463,200	7.6 mp	7.1 mp

Table 2.2.2.1 continued on the next page

Table 2.2.2.1 continued						
ACL = ABC LOW Recruitment Scenario **Action 2-1, Alt 4**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	15.4 mp	5.7 mp	1,313,280	4,386,720	9.7 mp	9.0 mp
2017/18	12.9 mp	4.8 mp	1,105,920	3,694,080	8.1 mp	7.5 mp
2018/19	11.9 mp	4.4 mp	1,013,760	3,386,240	7.5 mp	7.0 mp
2019/20	11.6 mp	4.3 mp	990,720	3,309,280	7.3 mp	6.8 mp

*ACT values are calculated based on formula from CMP Amendment 18 using the average PSE from 2005-2009.

Alternative 3: Establish ACL = OY = Deterministic equilibrium yield at $F_{30\%SPR}$ = 12.7 mp for fishing years 2016/17 through 2019/20.

Alternative 3	
Atlantic King Mackerel ACL	12.7 mp
Commercial ACL	4.7 mp
Northern Zone Quota	1,082,880 lbs
Southern Zone Quota	3,617,120 lbs
Recreational ACL	8.0 mp
Recreational ACT*	7.4 mp

*ACT value calculated based on formula from CMP Amendment 18, using the average PSE from 2005-2009.

Alternative 4: Establish ACL = OY = Deterministic equilibrium yield at 75% $F_{30\%SPR}$ = 11.6 mp for fishing years 2016/17 through 2019/20.

Note: 75% of F_{MSY} (which is the same as 75% $F_{30\%SPR}$ because 30% SPR is the proxy for MSY) is usually in the terms of reference (TORs) of all assessments. 75% F_{MSY} was the old OY, as yield at the long term F_{MSY} (MSY) was the old OFL. It is still part of the TORs in case the South Atlantic Council wants to choose that strategy to have stable catches rather than following the P recommendation and have changing catch levels each year.*

Alternative 4	
Atlantic King Mackerel ACL	11.6 mp
Commercial ACL	4.3 mp
Northern Zone Quota	990,720 lbs
Southern Zone Quota	3,309,280 lbs
Recreational ACL	7.3 mp
Recreational ACT*	6.8 mp

*ACT value calculated based on formula from CMP Amendment 18, using the average PSE from 2005-2009.

Alternative 5: Establish ACL = OY = 90% ABC based on the ABC levels selected under Action 2-1.

Table 2.2.2.2. Possible outcomes under Alternative 5 based on alternatives in Action 2-1. The recreational allocation is 62.9% and the commercial allocation is 37.1%. For the commercial ACL, the Northern Zone is 23.04% and the Southern Zone allocation is 76.96% (see Appendix E for details on how the Northern and Southern Zone quota allocations were recalculated using the SEDAR 38 boundary).

ACL = 90% ABC HIGH Recruitment Scenario **Action 2-1, Alt 2**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	15.7 mp	5.8 mp	1,336,320	4,463,680	9.9 mp	9.2 mp
2017/18	14.2 mp	5.3 mp	1,221,120	4,078,880	8.9 mp	8.3 mp
2018/19	12.7 mp	4.7 mp	1,082,880	3,617,120	8.0 mp	7.4 mp
2019/20	11.4 mp	4.2 mp	967,680	3,232,320	7.2 mp	6.7 mp
ACL = 90% ABC MEDIUM Recruitment Scenario **Action 2-1, Alt 3**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	14.9 mp	5.5 mp	1,267,200	4,232,800	9.4 mp	8.7 mp
2017/18	12.9 mp	4.8 mp	1,105,920	3,694,080	8.1 mp	7.5 mp
2018/19	11.6 mp	4.3 mp	990,720	3,309,280	7.3 mp	6.8 mp
2019/20	10.9 mp	4.0 mp	921,600	3,078,400	6.9 mp	6.4 mp
ACL = 90% ABC LOW Recruitment Scenario **Action 2-1, Alt 4**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	13.9 mp	5.2 mp	1,198,080	4,001,920	8.7 mp	8.1 mp
2017/18	11.6 mp	4.3 mp	990,720	3,309,280	7.3 mp	6.8 mp
2018/19	10.7 mp	4 mp	921,600	3,078,400	6.7 mp	6.2 mp
2019/20	10.4 mp	3.9 mp	898,560	3,001,440	6.5 mp	6.0 mp

*ACT values are calculated based on formula from CMP Amendment 18 using the average PSE from 2005-2009.

Note: Landings are reported in mixed whole and gutted weights. Therefore, ACLs and quotas will also be in mixed weights consistent with current regulations.

Discussion:

In this action, the Councils considered alternatives to set the ACL for Atlantic king mackerel based on the ABC selected in Action 2-1 or to set the ACL based on the following recommendation from the South Atlantic SSC:

The [South Atlantic] *SSC recommends the Council use a projection at the long-term, equilibrium yield at* $F_{30\%SPR}$ *as the ACL to reduce the risk of overfishing given the high uncertainty in future recruitment.*

Although the South Atlantic SSC provided a range of OFL and ABC levels (as discussed in Section 2.2.1), members also voiced concern about the uncertainty in recruitment when setting OFL and ABC levels. The South Atlantic SSC decided to also recommend that the Councils consider setting the ACL at the long-term equilibrium yield at $F_{30\%SPR}$, which would be 12.7 million pounds. This value differs from the projected yields in Table 2.2.1.1; however, the equilibrium yield represents a harvest level at which fishing mortality can be sustained, without the need to be adjusted every year. This harvest level would provide stability by setting one ACL for the 2016/17 through 2019/20 fishing years.

Alternative 1 (No Action) would not revise the ACL for Atlantic migratory group king mackerel based on the recent stock assessment and the modified stock boundary. The current ACL (including sector ACLs), commercial quotas, and recreational ACT are:

Total ACL= 10.46 mp
- Commercial ACL= 3.88 mp
  - Northern Zone Commercial Quota= 1,292,040 lbs
  - Southern Zone Commercial Quota= 2,587,960 lbs
- Recreational ACL= 6.58 mp
  - Recreational ACT= 6.11 mp

Preferred Alternative 2 and **Alternative 5** would set the ACL based on the ABC in Action 2-1, which would depend on the level of recruitment (high, medium or low) that the Councils consider to be appropriate for Atlantic king mackerel. The ACL could be set equal to the ABC (**Preferred Alternative 2**), or at a percentage of the ABC (**Alternative 5**) to provide an additional buffer. Public comments at hearings and the South Atlantic AP recommended setting the ACL equal to the high recruitment ABC (**Preferred Alternative 2**, in combination with Alternative 2 in Action 2-1).

Alternative 3 and **Alternative 4** are based on the South Atlantic SSC recommendation to use the long-term equilibrium yield at $F_{30\%SPR}$; **Alternative 4** includes an additional buffer by setting the ACL at 75% of the long-term equilibrium yield.

Public input during scoping meetings and hearings agreed with the South Atlantic AP recommendation to set the ACL equal to ABC (**Preferred Alternative 2**) under the high recruitment scenario ABC (Preferred Alternative 2 in Action 2-1). Overall, public input and the

South Atlantic AP support the highest ACL possible, which could only be achieved under Preferred Alternative 2 in Action 2-1, and Preferred Alternative 2 in Action 2-2.

Council Conclusions:

Although the South Atlantic SSC and the Gulf AP both recommended Alternative 3, public input favored Alternative 2, pointing to the healthy stock status determination from the SEDAR 38 stock assessment of Atlantic migratory group king mackerel. There was concern that relatively low landings in the Atlantic in recent years may be indicative of a problem with the stock; however, stakeholders pointed to the recent increase of juvenile king mackerel as evidence contrary to the recent trends in landings. The ACL and projections can be reviewed periodically, and the ACL modified to increase the quotas if feasible and necessary. The Councils concluded there would not be increased risk of overfishing by selecting Alternative 2 and setting the ACL at the highest level because recreational effort is not expected to increase and commercial effort is restrained by limited entry and trip limits. In light of these circumstances, the Councils chose to support Alternative 2.

2.3 Action 3 – Incidental Catch of Atlantic Migratory Group King Mackerel Caught in the Shark Gillnet Fishery

Alternative 1: No Action - Retention and sale of Atlantic king mackerel caught with gillnet as incidental catch in the gillnet portion of the commercial shark fishery remains prohibited.

Alternative 2: Allow retention and sale of Atlantic king mackerel caught with gillnet as incidental catch in the gillnet portion of the commercial shark fishery for any vessel with a valid shark directed commercial permit AND valid federal king mackerel commercial permit. The king mackerel must be sold to a dealer with the Gulf and South Atlantic federal dealer permit. For shark gillnet trips in the EEZ off Florida, no more than 2 king mackerel per crew member can be on board, and no more than 2 king mackerel per crew member can be sold from the trip. For shark gillnet trips in the EEZ north of the GA/FL line, no more than 3 king mackerel per crew member can be on board, and no more than 3 king mackerel per crew member can be sold from the trip.

Preferred Alternative 3: Allow retention and sale of Atlantic king mackerel caught with gillnet as incidental catch in the gillnet portion of the commercial shark fishery for any vessel with a valid shark directed commercial permit AND valid federal king mackerel commercial permit. The king mackerel must be sold to a dealer with the Gulf and South Atlantic federal dealer permit. For shark gillnet trips in the Atlantic Southern Zone, no more than 2 king mackerel per crew member can be on board, and no more than 2 king mackerel per crew member can be sold from the trip. For shark gillnet trips in the Atlantic Northern Zone, no more than 3 king mackerel per crew member can be on board, and no more than 3 king mackerel per crew member can be sold from the trip.

Discussion:

Prior to Amendment 20A to the CMP FMP (GMFMC and SAFMC 2013a), fishermen with both federal commercial shark permits and federal commercial king mackerel permits could sell the bag limit of king mackerel incidentally caught on shark gillnet trips. However, Amendment 20A prohibited bag limit sales in South Atlantic Council jurisdictional waters, which included incidentally caught king mackerel on shark trips. Gillnet gear is not an authorized gear type for king mackerel in the South Atlantic south of 34°37.3 N. latitude (Cape Lookout, NC)[1], further precluding fishermen south of Cape Lookout from selling incidentally caught king mackerel. Under **Alternative 1** (No Action), incidentally harvested king mackerel are currently discarded. Due to the mesh size and the nature of the shark gillnet fishery, most of the king mackerel are already dead when the gillnets are retrieved. The South Atlantic and Gulf APs were supportive of allowing shark gillnet fishermen to retain and sell king mackerel caught on shark gillnet trips.

Alternative 2 and **Preferred Alternative 3** would allow the retention and sale of Atlantic king mackerel caught in the shark gillnet fishery for any vessel that holds both a valid shark directed commercial permit and a valid federal king mackerel commercial permit. Under **Alternative 2**

[1] All gear except drift and long gillnets are allowed for king mackerel harvest north of Cape Lookout (see §622.375). The common gillnet gear type used for king mackerel harvest north of Cape Lookout is a sink (anchored) net.

and **Preferred Alternative 3**, the king mackerel would have to be sold to a dealer operating with a southeast federal seafood dealer permit. Landings data indicate that a small number of fishermen have landed king mackerel on gillnet trips targeting sharks (Table 2.3.1). There have been no shark gillnet trips with king mackerel landings in Georgia or South Carolina in the last five years.

Under **Alternative 2**, the incidental catch allowance would be limited to two Atlantic king mackerel per crew member to be retained and sold only for trips in the EEZ off Florida. For shark gillnet trips in the EEZ north of the Georgia/Florida state line, no more than three Atlantic king mackerel per crew member would be allowed to be retained or sold from a trip, as consistent with current bag limits. The incidental catch allowance under **Alternative 2** would not apply to commercial trips harvesting king mackerel with authorized gillnet gear north of 34°37.3′ N. latitude (Cape Lookout Light, NC). The existing commercial trip limit of 3,500 lbs would apply to fishing trips using authorized gear to harvest king mackerel north of Cape Lookout Light, NC. For fishing trips harvesting sharks with drift or long gillnet north of Cape Lookout Light, NC, vessels with the shark directed permit and federal commercial king mackerel permit would be subject to the 3 fish per crew member limit.

Under **Preferred Alternative 3**, the incidental catch allowance would be limited to two king mackerel per crew member to be retained and sold only for trips in the Atlantic Southern Zone. For shark gillnet trips in the Atlantic Northern Zone , no more than three king mackerel per crew member would be allowed to be retained or sold from a trip. As under **Alternative 2**, the incidental catch allowance under **Preferred Alternative 3** would not apply to commercial trips harvesting king mackerel with authorized gillnet gear north of 34°37.3′ N. latitude (Cape Lookout Light, NC) and the existing commercial trip limit of 3,500 lbs would be applied. Additionally, vessels with the necessary permits harvesting shark with drift or long gillnet would be subject to the limit of 3 fish per crew member.

Preferred Alternative 3 would allow consistent regulations for sale of king mackerel within each commercial zone, and the Councils are working towards revising regulations to align with the Atlantic Northern/Southern Zone system that was set up in Amendment 20B to improve enforcement and compliance while minimizing complexity of the regulations.

Table 2.3.1. Information on gillnet trips landing Atlantic sharks and Atlantic king mackerel in Florida from 2010-2014.

Year	# Gillnet Trips Shark[a]	# Gillnet Trips Shark and King Mackerel	# Participants with Shark/KM Gillnet Trips	Total Lbs King Mackerel Landed on Shark Gillnet Trips	Average Lbs King Mackerel Landed on Shark Gillnet Trips
2010	168	28	5	1255.3	44.8
2011	382	21	3	1039.0	49.5
2012	498	32	4	923.5	28.9
2013[b]	298	33	5	2635.4	79.9
2014[c]	161	23	4	2474.2	107.6
TOTAL	**1507**	**137**	**--**	**8327.3**	**60.8**

[a] Small coastal sharks (SCS)—blacknose, sharpnose, bonnethead, and finetooth
[b] SCS closed in September 30, 2013

[c] SCS closed in July 28, 2014
Source: ACCSP

Council Conclusions:

Both Councils' APs support Alternative 3, preferring that fish caught in gillnets (that will likely die if discarded) not be wasted to the extent possible. This alternative would reduce discards and allow commercial vessels to retain and sell king mackerel, but at low levels that would not encourage direct harvest. Alternative 3 will also make the limits consistent throughout each Atlantic migratory group management zone, aligning management with the Atlantic Northern and Southern Zone system.

2.4 Action 4 – Establish Commercial Split Seasons for Atlantic Migratory Group King Mackerel in the Atlantic Southern Zone

Alternative 1: No Action – The commercial fishing year for Atlantic king mackerel is March 1 – February 28. The Atlantic Southern Zone quota is allocated for the entire fishing year.

Preferred Alternative 2: Allocate the Atlantic Southern Zone quota for Atlantic king mackerel into two split season quotas: 60% to the period March 1 - September 30 (season 1) and 40% to the period October 1 – the end of February (season 2). Any remaining quota from season 1 would transfer to season 2. Any remaining quota from season 2 would not be carried forward. When the quota for the season is met or expected to be met, commercial harvest of king mackerel in the Atlantic Southern Zone will be prohibited for the remainder of the season.

Alternative 3: Allocate the Atlantic Southern Zone quota for Atlantic king mackerel into two split season quotas: 60% to the period March 1 – October 31 (season 1) and 40% to the period November 1 – the end of February (season 2). Any remaining quota from season 1 would transfer to season 2. Any remaining quota from season 2 would not be carried forward. When the quota for the season is met or expected to be met, commercial harvest of king mackerel in the Atlantic Southern Zone will be prohibited for the remainder of the season.

Alternative 4: Allocate the Atlantic Southern Zone quota for Atlantic king mackerel into two split season quotas: 50% to the period March 1 – October 31 (season 1) and 50% to the period November 1 – the end of February (season 2). Any remaining quota from season 1 would transfer to season 2. Any remaining quota from season 2 would not be carried forward. When the quota for the season is met or expected to be met, commercial harvest of king mackerel in the Atlantic Southern Zone will be prohibited for the remainder of the season.

Discussion:

Currently, king mackerel harvest in the EEZ off the Florida east coast is managed with a shifting boundary because part of the Florida east coast was designated as the mixing zone in past stock assessments (see Section 1.1 for details on boundaries and management). If the management boundary in Action 1 is approved, the Gulf Florida East Coast Subzone would no longer exist. The Councils would need to establish management measures for this area as part of the Atlantic king mackerel management system.

In April 2015, the South Atlantic AP made recommendations for management that would incorporate the Florida east coast into the Atlantic Southern Zone year-round, including the following recommendation on a split season for the Atlantic Southern Zone:

> *The Southern Zone quota would have seasonal allocations. The first season would be March 1 – September 30 and would be allocated 60% of the Southern Zone quota. The second season would be October 1- February 28 and would be allocated 40% of the Southern Zone quota plus any unused quota from the first season. There would be no sub-quota for the FLEC subzone. Quota transfers between the Northern Zone and Southern Zone would still be allowed.*

A large proportion (90% or higher) of the Atlantic Southern Zone quota is landed on the Florida east coast. A commercial split season for the Atlantic Southern Zone would ensure that a portion of the Atlantic Southern Zone quota would be available in the later months of the fishing year, even if there is a high level of harvest in the earlier months.

In general, landings patterns for the Atlantic Southern Zone show that landings are at high levels in the spring and start to decrease in the summer. The months of September through November usually have the lowest landings levels of the year, followed by an increase starting in November or December (Figure 2.4.1).

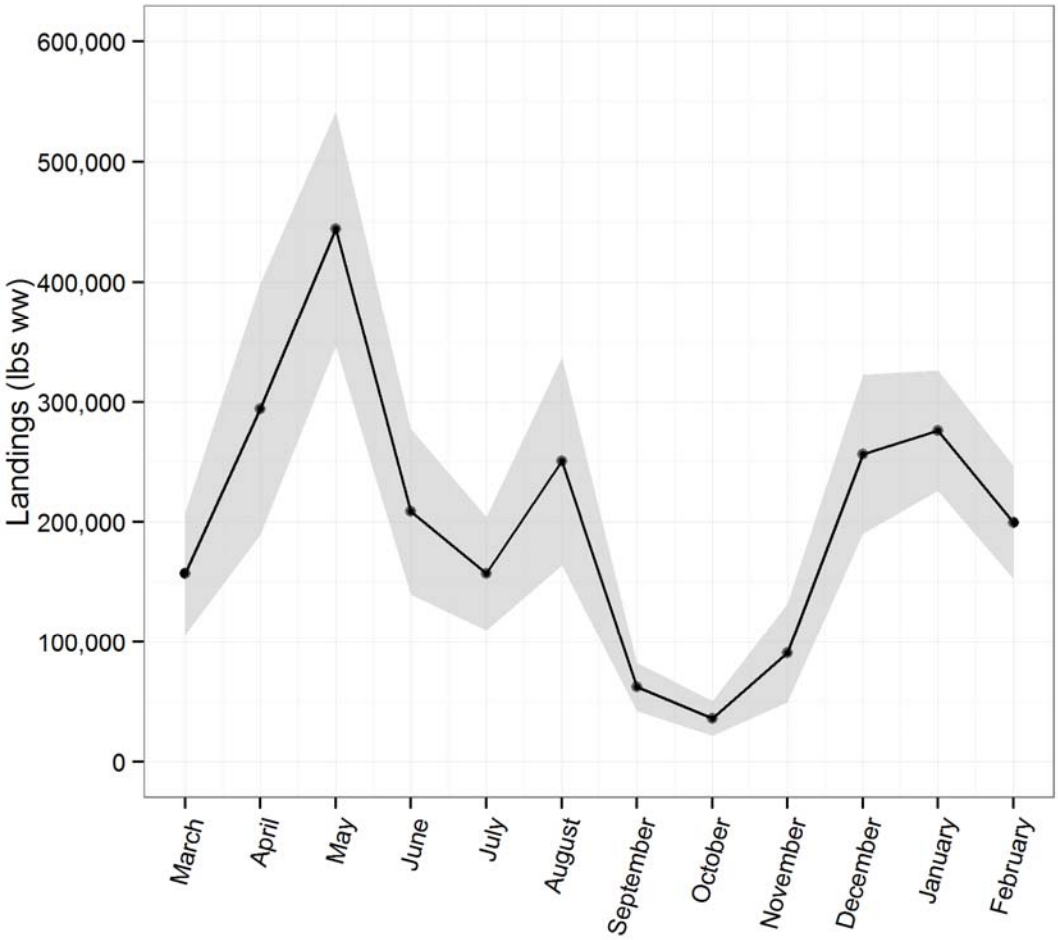

Figure 2.4.1. King mackerel commercial landings in the Atlantic Southern Zone by month for fishing years 1998-99 through 2013-14. The solid line shows the average pounds per month, and the gray shaded area includes pounds per month with CI= 95%.
Source: NMFS ALS

This action is intended to mirror the two-quota scenario created by the current management system. Under the current management system, harvest in the EEZ off the Florida east coast starting November 1 counts toward the quota for the Gulf Florida East Coast subzone, which means that landings on the Florida east coast in the earlier months of the fishing year do not

affect the availability of quota in the late fall months. However, if the Councils modify the management boundary in Action 1, harvest of king mackerel in the EEZ off the Florida east coast could count toward one quota (Atlantic Southern Zone) for the whole year, which may result in an early closure depending on the rate of harvest in the spring and summer.

At their November 2015 meeting, the Gulf AP voiced concern that the proposed split seasons would result in the same or higher number of fishermen traveling from the Florida east coast to the Gulf zones. The South Atlantic AP responded that they did not predict an increase in the number of fishermen traveling from the Florida east coast to the Gulf zones with the establishment of a split season to mirror the current system. Data indicate that years with low landings of Atlantic king mackerel likely contribute to more fishermen traveling from the Florida east coast to the Gulf zones, specifically the Western and Northern Zones (Figure 2.4.2). While there is a core group of 10-15 fishermen who travel between the Florida east coast and the Gulf Western and Northern Zones almost every year, the number of traveling fishermen has increased in recent years. Additional information about the traveling fishermen can be found in Section 4.4.3.

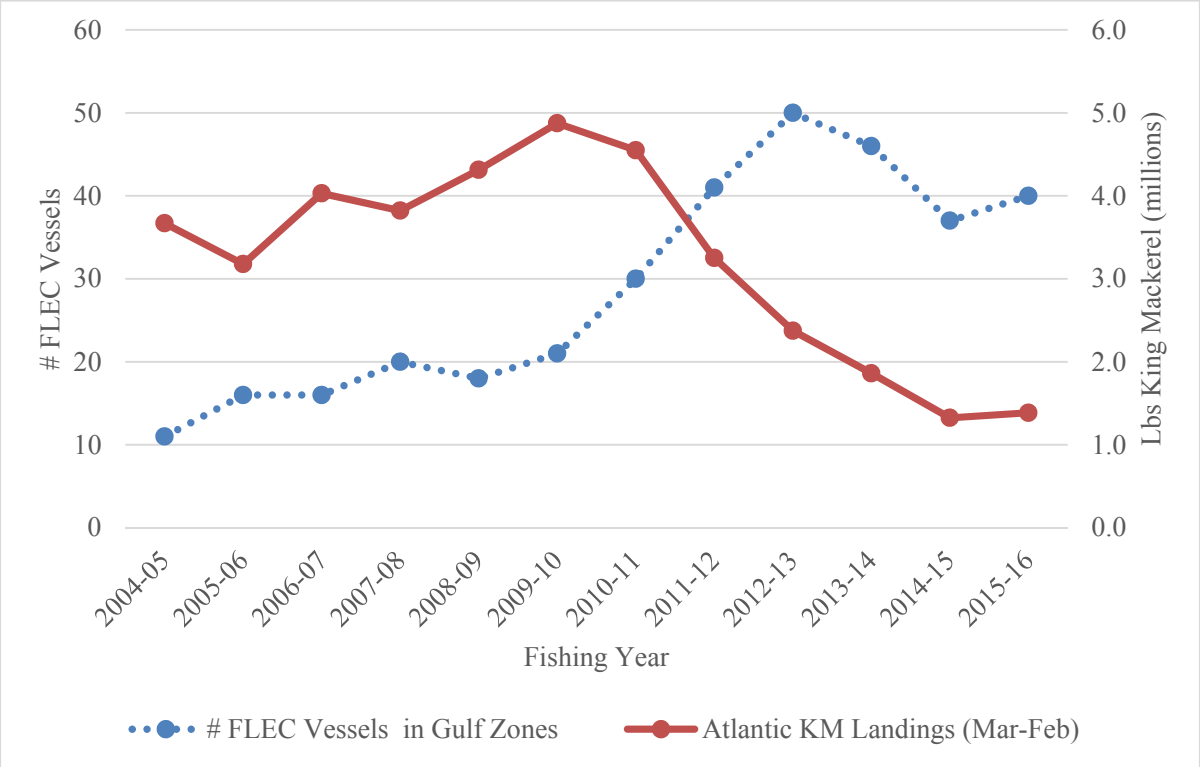

Figure 2.4.2. Number of Florida East Coast vessels (dotted blue) with king mackerel catch from the Gulf Western Zone each fishing year, compared to commercial landings of Atlantic king mackerel (red). Source: SEFSC Commercial Logbook

Alternative 1 (No Action) would not establish a commercial split season for the Atlantic Southern Zone. When king mackerel landings in the Southern Zone meet or are expected to meet the Atlantic Southern Zone quota, landings in the Atlantic Southern Zone would be prohibited for the remainder of the fishing year (unless there is a quota transfer from the Atlantic

Northern Zone). Under **Alternative 1**, there would be a risk that the Atlantic Southern Zone quota would be met before the productive period in the late fall. The Gulf Council was concerned that if the season 1 quota was met and the Southern Zone closed in late summer, more fishermen would travel to the Gulf to fish.

Preferred Alternative 2 would establish a commercial split season in which 60% of the Atlantic Southern Zone quota would be allocated to season 1 (March 1 through September 30), and 40% to season 2 (October 1 through the end of the February). This alternative is based on the recommendation from the South Atlantic AP. **Alternative 3** would also establish a commercial split season with 60% and 40% allocations, but with season 1 designated as March 1 through October 31, and season 2 as November 1 through the end of February. **Alternative 4** would establish a split season with equal allocations to season 1 (March 1 through October 31) and season 2 (November 1 through the end of February). In **Alternatives 2 (Preferred)-4**, any remaining quota from season 1 would roll over to season 2. Table 2.4.1 shows the potential split season quotas under different ABC and ACL scenarios for **Alternatives 2 (Preferred)** and **3**. Table 2.4.2 shows the potential split season quotas for **Alternative 4**.

Table 2.4.1. Examples of possible split season quotas for the Atlantic Southern Zone (in lbs) with a 60/40 allocation (Alternatives 2 and 3).

	ACL=ABC[1] High Recruitment[2]		ACL=ABC[1] Medium Recruitment[3]		ACL=Deterministic Equilibrium Yield at $F_{30\%SPR}$[4]	
	Season 1 (60%)	**Season 2 (40%)**	**Season 1 (60%)**	**Season 2 (40%)**	**Season 1 (60%)**	**Season 2 (40%)**
2016/17	3,001,440	2,000,960	2,816,736	1,877,824	2,170,272	1,446,848
2017/18	2,724,384	1,816,256	2,447,328	1,631,552		
2018/19	2,401,152	1,600,768	2,216,448	1,477,632		
2019/20	2,170,272	1,446,848	2,077,920	1,385,280		

[1] Alternative 2 under Action 2-2
[2] Alternative 2 under Action 2-1, ABC under High Recruitment Scenario
[3] Alternative 3 under Action 2-1, ABC under Medium Recruitment Scenario
[4] Alternative 3 under Acton 2-2

Table 2.4.2. Examples of possible split season quotas for the Atlantic Southern Zone (in lbs) with a 50/50 allocation (Alternative 4).

	ACL=ABC[1] High Recruitment[2]	ACL=ABC[1] Medium Recruitment[3]	ACL=Deterministic Equilibrium Yield at $F_{30\%SPR}$[4]

	Season 1 or 2 (50%)	Season 1 or 2 (50%)	Season 1 or 2 (50%)
2016/17	2,501,200	2,347,280	1,808,560
2017/18	2,270,320	2,039,440	
2018/19	2,000,960	1,847,040	
2019/20	1,808,560	1,731,600	

[1] Alternative 2 under Action 2-2
[2] Alternative 2 under Action 2-1, ABC under High Recruitment Scenario
[3] Alternative 3 under Action 2-1, ABC under Medium Recruitment Scenario
[4] Alternative 3 under Acton 2-2

Based on landings patterns for the Atlantic Southern Zone (Table 2.4.3), the risk that the season 1 or season 2 quota would be met and result in an early closure would vary, because landings for king mackerel in the Atlantic Southern Zone fluctuate from year to year depending on stock dynamics, environmental factors, and fishing effort.

The Atlantic Northern Zone quota would not be affected by establishing commercial split seasons for the Atlantic Southern Zone, unless there is a transfer during the year between zones as specified in Amendment 20B (GMFMC and SAFMC 2014). The recreational sector would not be directly affected by potential split seasons for the Atlantic Southern Zone.

Table 2.4.3. Total king mackerel commercial landings from the Atlantic Southern Zone, and percentages of the total landings under the potential split seasons. Landings are in pounds.

		March-September[1]		October- February[1]	
Fishing Year	**Total SZ Landings**	**Landings (lbs)**	**Proportion (%)**	**Landings (lbs)**	**Proportion (%)**
1998-99	2,268,020	1,087,858	48.0%	1,180,162	52.0%
1999-00	1,882,497	1,352,567	71.8%	529,930	28.2%
2000-01	2,034,291	1,308,891	64.3%	725,400	35.7%
2001-02	1,794,925	1,124,947	62.7%	669,978	37.3%
2002-03	1,699,936	962,863	56.6%	737,073	43.4%
2003-04	2,110,632	1,365,949	64.7%	744,683	35.3%
2004-05	2,253,822	1,778,407	78.9%	475,415	21.1%
2005-06	1,936,527	1,350,872	69.8%	585,655	30.2%
2006-07	2,738,512	1,896,802	69.3%	841,710	30.7%
2007-08	2,767,803	1,570,897	56.8%	1,196,906	43.2%
2008-09	3,243,900	2,070,303	63.8%	1,173,597	36.2%
2009-10	3,842,670	2,716,313	70.7%	1,126,357	29.3%
2010-11	4,302,830	3,104,614	72.2%	1,198,216	27.8%
2011-12	2,615,883	1,594,660	61.0%	1,021,223	39.0%
2012-13	1,930,041	1,095,609	56.8%	834,432	43.2%
2013-14	1,502,679	803,797	53.5%	698,882	46.5%
2014-15	1,392,025	765,975	55.0%	626,050	45.0%

[1]Potential seasons for Alternatives 2

		March-October[2]		November- February[2]	
Fishing Year	**Total SZ Landings**	**Landings (lbs)**	**Proportion (%)**	**Landings (lbs)**	**Proportion (%)**
1998-99	2,268,020	1,205,471	53.2%	1,062,549	46.8%
1999-00	1,882,497	1,371,907	72.9%	510,590	27.1%
2000-01	2,034,291	1,358,444	66.8%	675,847	33.2%
2001-02	1,794,925	1,153,715	64.3%	641,210	35.7%
2002-03	1,699,936	1,021,530	60.1%	678,406	39.9%
2003-04	2,110,632	1,393,093	66.0%	717,539	34.0%
2004-05	2,253,822	1,795,750	79.7%	458,072	20.3%
2005-06	1,936,527	1,368,436	70.7%	568,091	29.3%
2006-07	2,738,512	1,929,071	70.4%	809,441	29.6%
2007-08	2,767,803	1,597,353	57.7%	1,170,450	42.3%
2008-09	3,243,900	2,118,706	65.3%	1,125,194	34.7%
2009-10	3,842,670	2,774,083	72.2%	1,068,587	27.8%
2010-11	4,302,830	3,145,611	73.1%	1,157,219	26.9%
2011-12	2,615,883	1,602,782	61.3%	1,013,101	38.7%
2012-13	1,930,041	1,106,881	57.4%	823,160	42.6%
2013-14	1,502,679	818,231	54.5%	684,448	45.5%
2014-15	1,392,025	817,275	58.7%	574,751	41.3%

[2]Potential seasons for Alternative 3 and 4

Council Conclusions:

The Councils selected Alternative 2 as the preferred alternative based on the recommendation of the South Atlantic AP, and after reviewing data on the history and landings of fishermen who travel from the Atlantic coast of Florida to fish for king mackerel in the summer and fall in the Gulf of Mexico. These data indicate that the number of traveling king mackerel fishermen is increasing but that the number of traveling fishermen is likely associated with fishing conditions on the Florida east coast. If the Florida east coast is closed in the last few months of the fishing year because a year-round quota was met, it could be possible that more traveling fishermen would travel to the Gulf. Lastly, public testimony indicated that the increase in the Atlantic migratory group ACL preferred in Action 2-2 may decrease the desire of fishermen from the east coast of Florida to travel the Gulf to catch king mackerel.

2.5 Action 5 – Establish a Trip Limit System for the Atlantic Southern Zone

Alternative 1: No action. The trip limits for the Atlantic Southern Zone will remain:

North of the Flagler/ Volusia county line, the trip limit is 3,500 pounds (lbs) year-round.

In the area between the Flagler/ Volusia county line and the Volusia/Brevard county line, the trip limit is 3,500 lbs from April 1 through October 31.

In the area from the Volusia/Brevard county line to the Miami-Dade/Monroe county line, the trip limit is 75 fish from April 1 through October 31.

From November 1 through March 31, no trip limit is in place for the area between the Flagler/Volusia county line to the Dade/Monroe county line.

Alternative 2: In the Atlantic Southern Zone, the trip limit north of the Flagler/Volusia county line is 3,500 lbs. For the area south of the Flagler/Volusia county line, establish a year-round trip limit of 75 fish for Atlantic king mackerel.

Preferred Alternative 3: In the Atlantic Southern Zone, the trip limit north of the Flagler/Volusia county line is 3,500 lbs. For the area south of the Flagler/Volusia county line, establish a trip limit of 50 fish from March 1- March 31, and 75 fish for the remainder of season 1 (as designated in Action 4).

> **Option 3a:** Beginning on August 1 and continuing through the end of season 1, if 75% of the season 1 quota has been taken, the trip limit will be 50 fish.
> **Preferred Option 3b:** At any time during season 1, if 75% of the season 1 quota has been taken, the trip limit will be 50 fish.

Preferred Alternative 4: In the Atlantic Southern Zone, the trip limit north of the Flagler/Volusia county line is 3,500 lbs. For the area south of the Flagler/Volusia county line, establish a trip limit of 50 fish for season 2 (as designated in Action 4).

> **Preferred Option 4a:** Beginning on February 1 and continuing through the end of February--
> (1) If 70% or more of the season 2 quota has been taken, the trip limit is 50 fish.
> (2) If less than 70% of the season 2 quota has been taken, the trip limit is 75 fish.
> **Option 4b:** Beginning on January 1 and continuing through the end of February--
> (1) If 70% or more of the season 2 quota has been taken, the trip limit is 50 fish.
> (2) If less than 70% of the season 2 quota has been taken, the trip limit is 75 fish.
> **Option 4c:** Beginning on February 1 and continuing through the end of February--
> (1) If 80% or more of the season 2 quota has been taken, the trip limit is 50 fish.
> (2) If less than 80% of the season 2 quota has been taken, the trip limit is 75 fish.

Discussion:

Under the current management system, the Florida east coast is split between two seasons and separated by different county lines and different trip limits. From November 1 - March 31, the Gulf Florida East Coast Subzone extends from the Flagler/Volusia county line to the Dade/Monroe county line and has a trip limit of 50 fish with a potential step-up to 75 fish. From April 1 - October 31, this area is part of the Atlantic Southern Zone. The trip limit is 3,500 lbs for Volusia County, 75 fish from Volusia/Brevard county line to Dade/Monroe county line, and 1,250 lbs from the Dade/Monroe county line to the Council jurisdictional boundary. As discussed in Section 2.4, the current Florida East Coast Subzone under the Gulf management system will no longer exist if the management boundary is modified in Action 1 and the winter trip limits will also not exist. The current commercial trip limit north of the Flagler/Volusia county line is 3,500 lbs year-round and will not be changed by this action.

In April 2015, the South Atlantic AP provided the following recommendations:

March 1 through September 30
- The FLEC subzone would be from the Volusia/Brevard county line to the Dade/Monroe county line.
- The commercial trip limit in the FLEC subzone would be 75 fish with a possible step-down to 50 fish on May 1. The step-down could apply for only the month of May or through the summer.
- The commercial trip limit north of the Volusia/Brevard county line could be 3,500 lbs.

October 1 through February 28/29
- The FLEC subzone would be from the Flagler/Volusia county line to the Dade/Monroe county line.
- The commercial trip limit in the FLEC subzone would be 50 fish with a possible increase to 75% if X% of the quota has not been met by [date].
- The commercial trip limit north of the Flagler/Volusia county line could be 3,500 lbs.

Although the South Atlantic AP made recommendations specific to a designated area on the Florida east coast, the Councils decided to develop actions and alternatives that would apply to the entire Atlantic Southern Zone in order to reduce complexity of the regulations, and remove the shifting boundary.

Alternative 1 (No Action) would not change or establish commercial trip limits for the Atlantic Southern Zone. The trip limits that apply to the area under the Atlantic king mackerel management system would still apply for the months of April 1 through October 31. From November 1 through March 31, there would not be a trip limit in the area between the Flagler/Volusia county line to the Miami-Dade/Monroe county line, assuming the jurisdictional boundary is changed in Action 1.

Alternative 2 would set year-round commercial trip limits for the Atlantic Southern Zone with 3,500 lbs for the area north of the Flagler/Volusia line, and 75 fish per vessel per trip for the area south of the Flagler/Volusia line to the Miami-Dade/Monroe county line. This alternative can be selected in conjunction with one of the season-specific alternatives. The South Atlantic AP

recommended this alternative along with **Alternative 4**, in order to set up the season 1 trip limit in the area south of the Flagler/Volusia line to be 75 fish with no step-down, and a different trip limit for season 2.

Preferred Alternative 3 would set the commercial trip limits for the Atlantic Southern Zone for season 1, as designated in Action 4. The trip limit north of the Flagler/Volusia line would be 3,500 lbs. For the area south of the Flagler/Volusia line, the trip limit would be 50 fish for the period of March 1 through March 31. On April 1, the trip limit would increase to 75 fish with a possible step-down in **Option 3a** and **Preferred Option 3b**. **Option 3a** would establish a step-down to 50 fish for the remainder of season 1 if by August 1, more than 75% of the season 1 quota has been landed. Under **Preferred Option 3b**, the step-down to 50 fish could occur anytime during season 1 when 75% of the season 1 quota has been landed.

Preferred Alternative 4 was developed based on recommendations from the South Atlantic AP and is similar to the trip limit system in the current Gulf Florida East Coast Subzone from November through March. Under this alternative, in season 2 (as designated in Action 4), the trip limit for the area north of the Flagler/Volusia line would be 3,500 lbs. For the area south of the Flagler/Volusia line, the trip limit for season 2 would be 50 fish; under **Preferred Option 4a**, if less than 70% of the quota has been landed by February 1, the trip limit would increase to 75 fish per vessel for the remainder of the fishing year. If 70% or more of the quota has been landed by February 1, the trip limit would stay 50 fish per vessel. Under **Option 4b**, the same system would be in place except that the trigger date would be January 1. Under **Option 4c**, if less than 80% of the quota has been landed by February 1, the trip limit would increase to 75 fish per vessel for the remainder of the fishing year. If 80% or more of the quota has been landed by February 1, the trip limit would remain at 50 fish per vessel. The step down to 50 fish per vessel in **Preferred Alternative 4** could help extend the fishing season; the step up to 75 fish per vessel at the end of the season would allow the king mackerel fishermen to try to land all of the quota before the end of the fishing year. The timing of the step up would minimize the negative effects on dealers and fish houses due to the increase in king mackerel by allowing the increased trip limit to apply only in the final month (**Preferred Option 4a** and **Option 4c**) or final two months (**Option 4b**) of the fishing year.

The South Atlantic AP recommended **Preferred Alternative 4** and **Preferred Option 4a** for the season 2 trip limit system.

Council Conclusions:

The primary function of the split season structure preferred by the Councils in Alternative 2 of Action 4 is to ensure the longest commercial fishing season possible for Atlantic migratory group king mackerel. The trip limits preferred by the Councils were established in response to the changes in management zones preferred by the Councils in Alternative 3 of Action 1. The measures preferred by the Councils in Option 3b of Alternative 3 and Option 4a of Alternative 4 in this action are intended to provide continued access to king mackerel by commercial fishermen within the split season structure.

2.6 Action 6 – Modify the ACL for Gulf Migratory Group King Mackerel

Alternative 1: No action – Do not modify the ACL for Gulf migratory group king mackerel. The ACL of 10.8 million pounds will remain.

Preferred Alternative 2: Set the Gulf migratory group king mackerel ACL equal to the ABC recommended by the Gulf Scientific and Statistical Committee (SSC) for 2015-2019. ABC values are in millions of pounds:

Year	ABC	Recreational ACL	Commercial ACL
2016	9.21	6.26	2.95
2017	8.88	6.04	2.84
2018	8.71	5.92	2.79
2019	8.55	5.81	2.74

Alternative 3: Establish a constant catch scenario for the Gulf migratory group king mackerel ACL for one of the following time periods. The ACL during the selected time period may not exceed the ABC recommended by the Gulf SSC for any year during the selected time period.

Option a: A three-year period (2015-2017)
Option b: A five-year period (2015-2019)

Note: Landings are reported in mixed whole and gutted weights. Therefore, ACLs and quotas will also be in mixed weights consistent with current regulations.

Discussion:

SEDAR 38 (2014) was completed in August 2014 and included assessments for Gulf and Atlantic migratory groups of king mackerel. The Gulf SSC reviewed the Gulf migratory group king mackerel stock assessment during its January 2015 meeting, and accepted the assessment as the best available science. The assessment used fishery-independent and fishery-dependent indices of abundance spanning from 1930 to 2012 and provided stock status benchmarks (Table 2.6.1). The Gulf SSC then recommended OFL and ABC values for the stock (Table 2.6.2).

Table 2.6.1. Stock benchmarks as proposed by the SEDAR 38 stock assessment of Gulf migratory group king mackerel.

Criteria	Deterministic
Overfished evaluation	No, SSB/SSB30%SPR= 2.10
Overfishing evaluation	No, F/F30%SPR = 0.507
F_{2012}	0.08
MFMT ($F_{30\%SPR}$)	0.157
SSB_{2012}	2353 metric tons
SSB_{MSY} ($SSB_{30\%SPR}$)	1120 metric tons
P-Star	0.5 (OFL); 0.43 (ABC)

Table 2.6.2. Gulf SSC recommendations for OFL and ABC for Gulf migratory group king mackerel, using data resultant from SEDAR 38 (2014). Values are in millions of pounds.

Year	OFL: *P* = 0.50*	ABC: P* = 0.43
2015	10.11	9.62
2016	9.61	9.21
2017	9.27	8.88
2018	9.11	8.71
2019	8.95	8.55

The Councils may set the Gulf king mackerel ACL at the same level as the ABC recommended by the Gulf SSC in Table 2.6.2 above (**Preferred Alternative 2**). Such an approach was used in Amendment 18 to the CMP FMP (GMFMC and SAFMC 2011), when Gulf king mackerel was determined to be healthy (SEDAR 16 2008). The most current assessment (SEDAR 38 2014) determined the stock is still healthy.

Alternatively, the Councils set a constant catch scenario for the ACL (**Alternative 3**), whereby the ACL would be set to some level below the ABC for a predetermined time period (**Option a** or **b**). An important caveat is that the ACL cannot exceed the ABC recommendation from the Gulf SSC for any year in the time period selected. Constant catch scenarios require an allocation determination in order to be calculated. If constant catch scenarios are developed using the current allocation, and then the Councils select a different allocation in Action 8, the constant catch scenarios will no longer be accurate. Therefore, this alternative is not feasible unless allocation scenario is established. If the Councils select an allocation strategy which differs from the status quo in Action 8, then the Councils would need to request an update of the ABC projections for Gulf group king mackerel to include **Options a** and **b** of **Alternative 3**, taking into consideration recent landings not includes in previous yield estimates. The Gulf SSC would then need to approve the updated projections for consideration by the Councils.

The area attributed to Gulf king mackerel is now smaller (demarcated in the east by a line running south at 83° west from the Dry Tortugas to the shelf edge) than previously described in past stock assessments (Old mixing zone: lower panel of Figure 2.1.1; new mixing zone: Figure 2.1.4). Even though the Gulf OFL and ABC projections are lower than the current ACL, the amount of area for which the *new* OFL and ABC recommendations applies is smaller than the area for which the *old* ACL applies. The area currently known as the Florida East Coast Subzone would be formally recognized as part of the Atlantic migratory group if so preferred in

Action 1, removing it from the Gulf migratory group (this would be concurrent with the SEDAR 38 stock assessment). This rezoning designates additional fish to the Atlantic migratory group, but also a proportionally larger amount of fishing effort. Therefore, the proposed ACLs for the Gulf migratory group represent an increase in the allowable catch for the new Gulf migratory group area (see Table 2.7.3).

Council Conclusions:

According to the SEDAR 38 (2014) stock assessment of Gulf migratory group king mackerel, the stock is not overfished and is not experiencing overfishing. Given this information, the Councils chose to set the ACL equal to the ABC under Preferred Alternative 2, foreseeing little risk of overfishing in doing so. The Councils did not express any interest in pursuing a constant catch scenario at this time (Alternative 3 and options), and as such did not request the requisite analyses to fully consider Alternative 3 and its options. Without the requisite aforementioned projections, a thorough analysis of the effects of Alternative 3 and its options was not possible.

2.7 Action 7 – Revise the Commercial Zone Quotas for Gulf Migratory Group King Mackerel

Alternative 1: No action – Maintain the current commercial zone quotas for Gulf migratory group king mackerel (Western Zone: 31%; Northern Zone: 5.17%; Southern Zone Handline: 15.96%; Southern Zone Gillnet: 15.96%; Florida East Coast Zone: 31.91%).

Alternative 2: Revise the commercial zone quotas for Gulf migratory group king mackerel by dividing the Florida East Coast Zone's quota into four equal parts, to be added to each of the remaining Gulf commercial zones.

Alternative 3: Revise the commercial zone quotas for Gulf migratory group king mackerel by dividing each individual zone's quota percentage by the sum of the quota percentages for all Gulf commercial zones *except* the Florida East Coast Zone, with each resultant percentage becoming that respective zone's new commercial quota.

Preferred Alternative 4: Revise the commercial zone quotas for Gulf migratory group king mackerel as follows: 40% for the Western Zone; 18% for the Northern Zone; 21% for the Southern Zone Handline component; and 21% for the Southern Zone Gillnet component.

Discussion:

The current allocations, which include the Gulf Florida East Coast Subzone, are shown in Table 2.7.1. In keeping with the aforementioned changes in the stock boundaries identified in SEDAR 38 (2014) and the proposed changes to the Council jurisdictional boundary in Action 1, the Councils would need to reallocate the commercial ACL amongst the three remaining fishing zones in the Gulf (Western Zone, Northern Zone, and Southern Zone).

Table 2.7.1. Current commercial fishing zone allocations for Gulf migratory group king mackerel.

Gulf King Mackerel: Commercial Zone Allocations	
Zone	Percent of Commercial Allocation
Western	31%
Northern	5.17%
Southern: Handline	15.96%
Southern: Gillnet	15.96%
FL East Coast	31.91%

The Florida East Coast Subzone would be integrated into the Atlantic Southern Zone if the change to the stock boundary in Action 1 is adopted by the Councils. The result would be an imbalance in the distribution of quota for the Gulf commercial sector of king mackerel (i.e., the remaining commercial zone allocations would not sum to 100%), and thus necessitates

reallocation. Options for reallocation might include equal (**Alternative 2**), proportional (**Alternative 3**), or some other distribution (**Preferred Alternative 4**) of the available 31.91% (from the no longer existing Florida East Coast Subzone), as demonstrated in Tables 2.7.2 and 2.7.3. Each of the presented reallocation options would result in additional fish for each of the Gulf commercial zones.

Table 2.7.2. Options for redistribution of commercial zone allocation for Gulf migratory group king mackerel by percentage.

Zone	Alternative 1 No Change	Alternative 2 "Equal"	Alternative 3 "Proportional"	Alternative 4 (AP recommended)
Western	31%	38.98%	45.53%	40%
Northern	5.17%	13.15%	7.61%	18%
Southern: H/L	15.96%	23.93%	23.43%	21%
Southern: Gillnet	15.96%	23.93%	23.43%	21%
FL East Coast	31.91%			

Table 2.7.3. Options for redistribution of commercial zone allocation for Gulf migratory group king mackerel in pounds of fish. Pounds for Alternatives 2-4 are based on the ACL = ABC in Preferred Alternative 2 of Action 6, and the sector allocations in Preferred Alternative 1 in Action 8.

Zone	Alternative 1 No Change	Alternative 2 "Equal"	Alternative 3 "Proportional"	Alternative 4 (AP recommended)
Western	1,071,360	1,199,883	1,401,596	1,231,360
Northern	178,675	404,733	234,266	554,112
Southern: H/L	551,578	736,892	721,269	646,464
Southern: Gillnet	551,578	736,892	721,269	646,464
FL East Coast	1,102,810			

Table 2.7.4. Commercial zone allocations (in pounds) for Gulf migratory group king mackerel with Preferred Alternative 4.

Year	Western	Northern	Southern H&L	Southern Gillnet
2016	1,180,000	531,000	619,500	619,500
2017	1,136,000	511,200	596,400	596,400
2018	1,116,000	502,200	585,900	585,900
2019	1,096,000	493,200	575,400	575,400

Note: The commercial ACL is divided into handline and gillnet ACLs. The sum of the Western, Northern, and Southern H/L quotas equals the handline ACL. The Southern Gillnet quota equals the gillnet ACL.

Preferred Alternative 4 was proposed by the Gulf and South Atlantic AP. The Gulf AP noted the low current commercial allocation for the Northern Zone (5.17%, **Alternative 1**, Table 2.7.2), and the new season opening date for that zone (October 1, Amendment 20A). The Gulf AP determined that increasing the quota for the Northern Zone would allow permit holders in that region who have not had landings in several years the opportunity to fish commercially for king mackerel. Permit holders in the Northern Zone include both dually permitted for-hire and

commercial participants. These permit holders have historically remarked that the Northern Zone quota has been landed before the charter fleet concludes the tourist season (usually by October 1) and/or before king mackerel migrate far enough east and south along the western Florida coastline to make fishing profitable.

Council Conclusions:

The Councils heard testimony in support of Alternatives 2, 3, and 4; however, they ultimately chose to prefer Alternative 4, which was crafted and recommended by the Gulf AP to address an historic under-allocation to the Gulf Northern Zone. This choice was made in part to address increasing effort in an area that was previously allocated a relatively small portion of the commercial king mackerel quota. The Councils anticipate that Alternative 4, combined with the ACL increase preferred in Alternative 2 of Action 6, will lead to longer commercial fishing seasons in all three Gulf zones, but especially in the Gulf Northern Zone.

2.8 Action 8 – Revise the Recreational and Commercial Allocations for the Gulf Migratory Group King Mackerel

Preferred Alternative 1: No action – Maintain the current recreational and commercial allocations for Gulf migratory group king mackerel (68% recreational, 32% commercial).

Alternative 2: Revise the recreational and commercial allocations for Gulf migratory group king mackerel by dividing the stock ACL using one of the options below.

Option a: 63% to the recreational sector, and 37% to the commercial sector.
Option b: 58% to the recreational sector, and 42% to the commercial sector.
Option c: 48% to the recreational sector, and 52% to the commercial sector.

Alternative 3: Revise the recreational and commercial allocations for Gulf migratory group king mackerel by transferring a percentage of the stock ACL to the commercial allocation annually until such a time that the recreational sector lands 80% of its allocation, after which no additional allocation will be transferred from the stock ACL to the commercial allocation.

Option a: Transfer 2% of the stock ACL annually to the commercial allocation.
Option b: Transfer 5% of the stock ACL annually to the commercial allocation.

Alternative 4: Conditionally transfer a certain percentage (*Options a-d*) of the stock ACL to the commercial sector until such a time that recreational landings reach a predetermined threshold (*Options e-g*). If this threshold is met, the recreational and commercial allocations will revert to 68% for the recreational sector and 32% for the commercial sector.

Conditional Quota Transfer (MUST CHOOSE ONE):
Option a: Transfer 5% of the stock ACL to the commercial sector.
Option b: Transfer 10% of the stock ACL to the commercial sector.
Option c: Transfer 15% of the stock ACL to the commercial sector.
Option d: Transfer 20% of the stock ACL to the commercial sector.

Recreational ACL Threshold (MUST CHOOSE ONE):
Option e: Revert to the status quo sector allocations if 80% of the adjusted recreational sector ACL is landed.
Option f: Revert to the status quo sector allocations if 90% of the adjusted recreational sector ACL is landed.
Option g: Revert to the status quo sector allocations if 100% of the adjusted recreational sector ACL is landed.

Alternative 5: Establish a sunset provision for any change in the sector allocations for Gulf migratory group king mackerel. After the predetermined time period, any change in sector allocations would revert back to the allocations specified in the original CMP FMP (68% for the recreational sector and 32% for the commercial sector).

Option a: Sunset any change in sector allocations after a five year period (2017-2021).
Option b: Sunset any change in sector allocations after a ten year period (2017-2026).
Option c: Sunset any change in sector allocations after a fifteen year period (2017-2031).

Discussion:

Over the past ten years, the commercial sector of the Gulf king mackerel fishery has consistently landed near the commercial ACL while the recreational sector has landed low proportions of the recreational ACL. Recent landings of Gulf king mackerel are shown in Table 2.8.1 and Figure 2.8.1. The fishing year for the time series presented is July1 – June 30.

Table 2.8.1. Proportion of sector ACLs landed and proportion of total ACL landed for Gulf king mackerel, including those landings attributed to the Florida East Coast Zone (FLEC). The FLEC landings are included here since there is not a recreational allocation specifically for the FLEC Zone.

Fishing Year	Total TAC/ACL	Comm Sector ACL	Comm Landings	Rec Sector ACL	Rec Landings	% of Sector ACL Landed		% of Total ACL Landed
						Comm[1]	Rec[2]	
2001/02	10.2 mp	3.264 mp	2.902 mp	6.936 mp	3.669 mp	88.9%	52.9%	64.7%
2002/03	10.2 mp	3.264 mp	3.186 mp	6.936 mp	2.816 mp	97.6%	40.6%	59.3%
2003/04	10.2 mp	3.264 mp	3.094 mp	6.936 mp	3.211 mp	94.8%	46.3%	62.7%
2004/05	10.2 mp	3.264 mp	3.215 mp	6.936 mp	2.532 mp	98.5%	36.5%	56.4%
2005/06	10.2 mp	3.264 mp	2.983 mp	6.936 mp	2.996 mp	91.4%	43.2%	58.9%
2006/07	10.8 mp	3.456 mp	3.231 mp	7.344 mp	3.305 mp	93.5%	45.0%	60.5%
2007/08	10.8 mp	3.456 mp	3.459 mp	7.344 mp	2.629 mp	100.1%	35.8%	56.3%
2008/09	10.8 mp	3.456 mp	3.833 mp	7.344 mp	2.350 mp	110.9%	32.0%	57.6%
2009/10	10.8 mp	3.456 mp	3.674 mp	7.344 mp	3.525 mp	106.3%	48.0%	68.0%
2010/11	10.8 mp	3.456 mp	3.522 mp	7.344 mp	2.181 mp	101.9%	29.7%	53.0%
2011/12	10.8 mp	3.456 mp	3.428 mp	7.344 mp	2.438 mp	99.2%	33.2%	54.3%
2012/13	10.8 mp	3.456 mp	3.539 mp	7.344 mp	2.710 mp	102.4%	36.9%	57.9%
2013/14	10.8 mp	3.456 mp	3.055 mp	7.344 mp	2.916 mp	88.4%	39.7%	55.3%
2014/15[3]	10.8 mp	3.456 mp	3.591 mp[3]	7.344 mp	4.576 mp	103.9%	62.3%	75.6%

[1]Commercial allocation = 32% [2]Recreational allocation = 68%
[3] Commercial landings are preliminary for 2014/15
Source: SERO

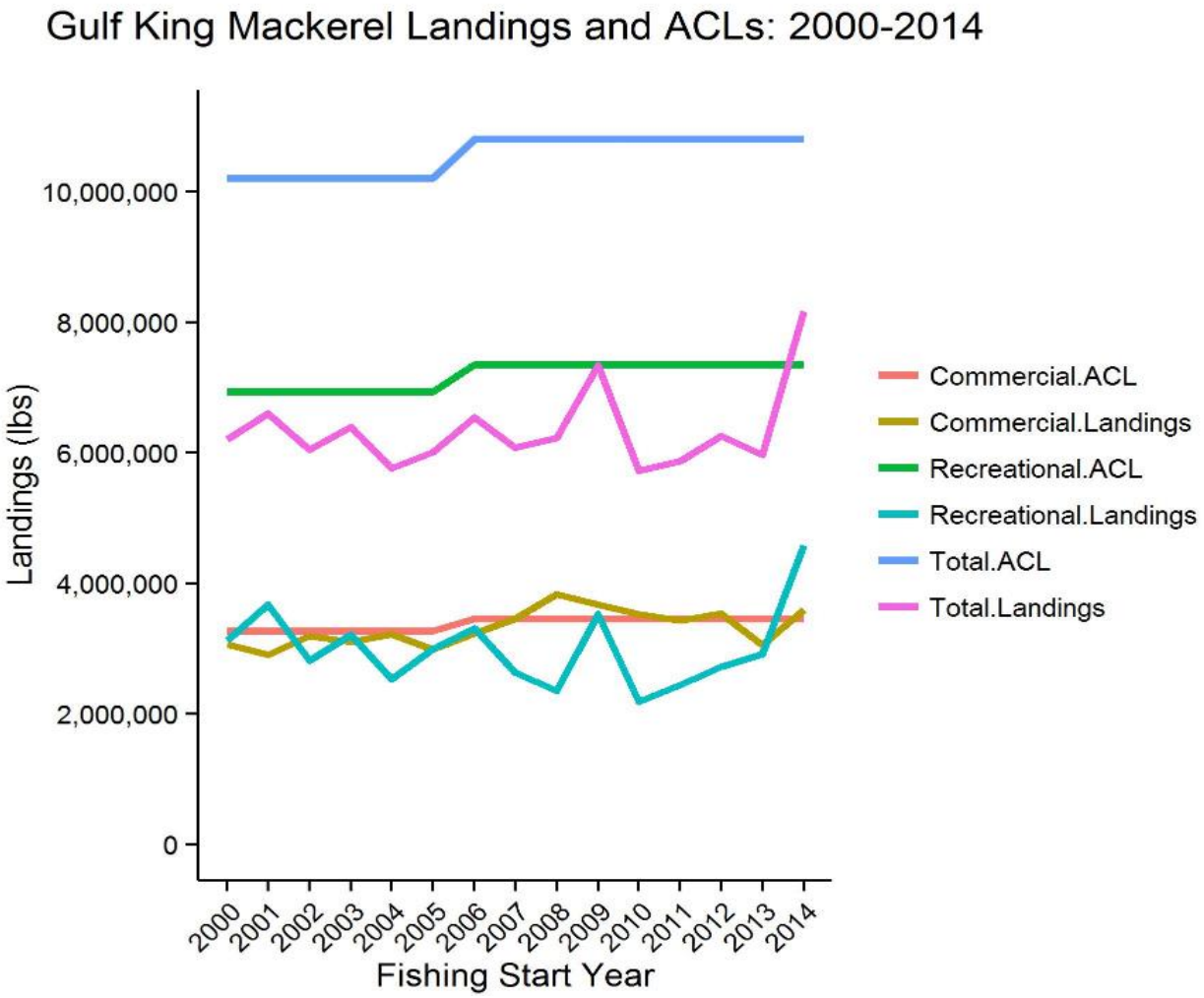

Figure 2.8.1. Trends in Gulf king mackerel landings by sector for the 2000-01 to the 2014-15 fishing seasons. Landings are in pounds.

Preferred Alternative 1 would maintain the current recreational and commercial allocations of 68% and 32% respectively, which were established in the original CMP FMP in February 1983. Over the last decade, the recreational sector has not landed its allocation, while the commercial sector has typically met or exceeded its allocation. Closures for the commercial sector are facilitated by the National Marine Fisheries Service (NMFS), which provides notice to fishermen prior to closing each commercial zone to fishing when that zone's quota is projected to be reached. This trend would be expected to continue, at least in the short term under **Preferred Alternative 1**.

Alternative 2 would revise the recreational and commercial allocations for Gulf migratory group king mackerel by transferring some percentage of the stock ACL to the commercial sector. Options for such a transfer in allocation include 5% (**Option a**), 10% (**Option b**), and 20% (**Option c**). Transferring allocation to the commercial sector could increase the likelihood of an overage in the recreational sector if effort increases in the future. Likewise, increasing the commercial sector's allocation would likely result in those additional fish allocated to the commercial sector being landed, in addition to those fish landed by the recreational sector,

thereby increasing the overall combined amount of Gulf migratory group king mackerel landed annually. Increased landings should not have an adverse effect on the health of Gulf migratory group king mackerel, so long as the ABC is not exceeded. Table 2.8.2 shows the resultant allocations based on the options presented in this action.

Table 2.8.2. Resultant allocations based on alternatives and options presented in Action 8. Alternative 3 would be dependent upon the landings reported in the year during which the recreational sector landed 80% of its allocation.

Option	Commercial Allocation	Recreational Allocation
Alternative 1	32%	68%
Alternative 2, Option a	37%	63%
Alternative 2, Option b	42%	58%
Alternative 2, Option c	52%	48%
Alternative 3		
Alternative 4, Option a	37%	63%
Alternative 4, Option b	42%	58%
Alternative 4, Option c	47%	53%
Alternative 4, Option d	52%	48%

Alternative 3 would revise the recreational and commercial allocations for Gulf migratory group king mackerel by transferring a percentage of the stock ACL to the commercial allocation annually until such a time that the recreational sector lands 80% of its allocation, after which no additional allocation would be transferred to the commercial allocation. These annual percentage transfers could amount to 2% of the stock ACL (**Option a**) or 5% (**Option b**). The actual resultant sector allocations would depend on the landings reported in the year during which the recreational sector landed 80% of its allocation.

Alternative 4 would conditionally transfer a certain percentage of the stock ACL to the commercial sector until such a time that the recreational ACL reaches a predetermined threshold. If the recreational ACL threshold is met, then the recreational and commercial allocations would revert to the status quo allocation of 68% for the recreational sector and 32% for the commercial sector. The Councils proposed four options for transferring quota to the commercial sector: 5% (**Option a**), 10% (**Option b**), 15% (**Option c**), and 20% (**Option d**). The resultant allocations for each sector under each option are shown in Table 2.8.2. The proposed recreational ACL thresholds are to revert to the status quo sector allocations if 80% (**Option e**), 90% (**Option f**), of 100% (**Option g**) of the adjusted recreational sector ACL is landed.

Alternative 5 would establish a sunset provision for any change in the sector allocations for Gulf king mackerel. After the predetermined time period, any change in sector allocations would revert back to 68% for the recreational sector and 32% for the commercial sector. Options for time periods after which any sector allocation change would end include five years (**Option a**), ten years (**Option b**), and fifteen years (**Option c**). If the Councils prefer one of the options in **Alternative 5**, the prescribed sunset period would begin in the fishing year following the

implementation of the regulations. The change in sector allocations would revert after the conclusion of the last fishing season in the time period chosen from the options in **Alternative 5**.

Council Conclusions:

The Councils selected Alternative 1 as the preferred based on the Gulf AP recommendation, and the increase in recreational landings of Gulf king mackerel in the 2014-2015 fishing season. The potential increase in the bag limit in Action 9 could increase recreational landings, resulting in an in-season closure if the recreational ACL is reduced due to changes in the allocation. The Gulf Council did, however, direct staff to develop another amendment to examine alternatives to share allocation between the commercial and recreational sectors.

2.9 Action 9 – Modify the Recreational Bag Limit for Gulf Migratory Group King Mackerel

Alternative 1: No action - Maintain the current recreational bag limit of two fish per person per day.

Preferred Alternative 2: Increase the bag limit to three fish per person per day.

Alternative 3: Increase the bag limit to four fish per person per day.

Discussion:

At the March 2015 Gulf AP meeting, members discussed reallocating from the recreational ACL to the commercial ACL (Action 8). Recreational landings decreased starting in the mid-1990s, and the recreational sector landed less than half of the recreational ACL from the 2002/2003 fishing season through the 2013/2014 fishing season (Table 2.9.1). However, in the 2014/2015 season, landings increased substantially. The Gulf AP recommended that the Gulf Council abstain from reallocating any king mackerel from the recreational sector to the commercial sector until after additional options for utilizing excess recreational quota are explored for the recreational sector.

Some Gulf AP members thought the initial decrease of the bag limit to two fish per person per day in the mid-1990s may have been partly to blame for the decrease in recreational effort in the Gulf. Additionally, recent short recreational seasons for popular reef fish species may result in more effort shifting to king mackerel. Decreased fuel prices and a general improvement in the economy may also encourage greater recreational effort for king mackerel. The Gulf AP recommended an increase to three fish per person per day for the Gulf recreational bag limit as a way to potentially increase utilization of the recreational ACL. A bag limit increase is not currently being considered for the recreational sector in the South Atlantic; however, recreational landings in the South Atlantic Council's jurisdiction have been below the recreational annual catch target in recent years (Table 3.1.1.2).

Alternative 1 would maintain a two-fish bag limit. During 2011-2013, only 7% of anglers landed two or more fish and only 11% of anglers landed one fish (Figure 2.9.1, Appendix C). Most trips (82%) reported less than one fish per angler[2]. From this, one could infer that the majority of anglers would not catch more fish if allowed. However, anglers may currently stop fishing after landing one or two fish, but would continue if they were allowed to catch more fish.

Estimations of how landings might increase if bag limits were higher are difficult because they involve speculation about how many anglers would, in fact, catch more fish if allowed. Two methods were used for this action: Method 1 assumed all anglers currently catching two fish would catch the maximum allowed and Method 2 assumed all anglers currently catching two fish would have retained any discards if the bag limit was higher. Method 1 produces the high end of

[2] Landings are reported by vessel, and the number of fish landed is divided by the number of anglers. If not all anglers land a fish, the number of fish per angler will be less than one.

the range; probably not all anglers that currently catch two fish would keep more. Method 2 produces the low end of the range, although some discards may be due to not meeting the minimum size limit rather than exceeding the bag limit. Details of the analysis are in Appendix C. In either case, angler behavior cannot be predicted. Uncertainty also exists in the projections due to economic conditions, weather events, changes in catch-per-unit effort, and a variety of other factors.

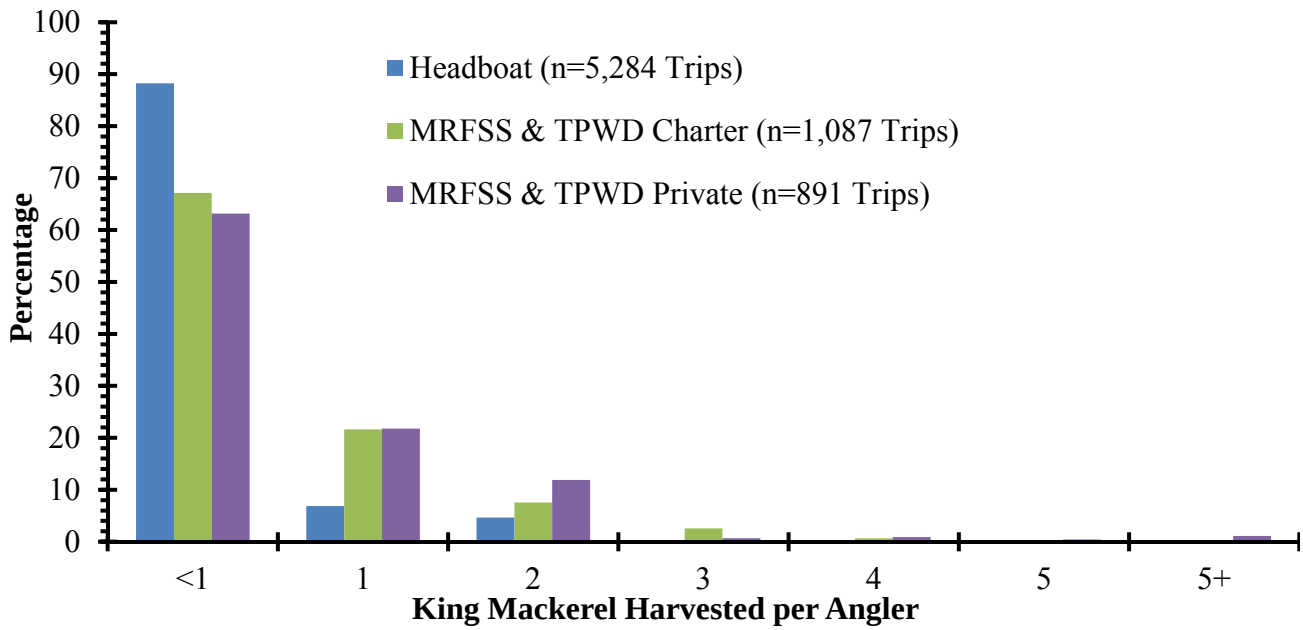

Figure 2.9.1. Distribution of Gulf migratory group king mackerel harvested per angler by mode from 2011 through 2013.
Source: NMFS SERO LAPP/DM Branch.

Based on the two methods described above, a three-fish bag limit (**Preferred Alternative 2**) would increase landings by an estimated 1-10% (weighted by mode) and a four-fish bag limit (**Alternative 3**) would increase landings by an estimated 3-21% (weighted by mode) (Table 2.9.1).

Table 2.9.1. Estimated percent increase in Gulf migratory group king mackerel recreational landings with an increase in the bag limit (based on 2011-2013 data). Estimates were weighted based on the percentage of landings each fishing mode contributed to the overall landings during 2011-2013. See Appendix C for more details.

Bag Limit	Method 1	Method 2
3 fish per person per day	10.1%	0.9%
4 fish per person per day	21.1%	3.1%

Source: NMFS SERO LAPP/DM Branch

<u>Council Conclusions</u>:

The Councils selected Alternative 2 based on the Gulf AP recommendation. Public input was supportive of all three alternatives, but largely favored some amount of increase in the

recreational bag limit. The Councils thought that increasing the bag limit to three fish instead of four, it would afford the Councils with the opportunity to see the effect of raising the bag limit in a more controlled manner, especially given the 53% increase in recreational landings under the current bag limit of two fish per person between the 2013-2014 and 2014-2015 fishing seasons.

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 Description of the Fishery and Status of the Stock

3.1.1 Description of the Fishery

A detailed description of the coastal migratory pelagic (CMP) fishery was included in Amendment 18 to the Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region (FMP) (GMFMC and SAFMC 2011) and is incorporated here by reference, as well as further summarized below. Amendment 18 can be found at http://www.gulfcouncil.org/docs/amendments/Final%20CMP%20Amendment%2018%20092311%20w-o%20appendices.pdf.

King Mackerel

A federal king mackerel commercial vessel permit is required to retain king mackerel in excess of the bag limit in federal waters of the Gulf of Mexico (Gulf) and Atlantic and to sell king mackerel from federal waters. These permits are limited access. In addition, a limited-access gillnet permit is required to use gillnets in the Gulf Southern Zone. As of January 13, 2016, there were 1,448 valid or renewable commercial king mackerel permits and 17 valid or renewable gillnet permits. For-hire vessels must have either a Gulf or South Atlantic charter/headboat CMP vessel permit, depending on where they fish. The Gulf for-hire permit is limited access, but the South Atlantic for-hire permit is open access. The commercial king mackerel permits do not have an income requirement (Amendment 20A: GMFMC and SAFMC 2013a). As of January 13, 2016, there were 1,288 valid (non-expired) or renewable Gulf charter/headboat pelagic fish permits, 34 historical captain charter/headboat pelagic fish permits, and 1,419 South Atlantic charter/headboat pelagic fish permits.

For the commercial sector, the area occupied by Gulf migratory group king mackerel is divided into zones. The Western Zone extends from the southern border of Texas to the Alabama/Florida state line. The fishing year for this zone is July 1 through June 30 (Figure 3.1.1.1). The Northern Zone extends from the Alabama/Florida state line in the west to the Lee/Collier county line in the South, with a fishing year of October 1 through September 30. The Southern Zone extends south of the Lee/Collier county line, with a fishing year from July 1 through June 30. In the Southern Zone, the gillnet season opens on the day after the Martin Luther King, Jr. holiday. Gillnet fishing is allowed during the first weekend thereafter, but not on subsequent weekends.

The waters off Florida are divided at the Monroe/Dade county line, which corresponds to the easternmost border between the Gulf and Atlantic king mackerel migratory groups. The Florida East Coast Subzone is currently from the Flagler/Volusia county line south to the Dade/Monroe county line and only exists from November 1 through March 31. King mackerel in this subzone are considered part of the Atlantic migratory group during summer (Figure 3.1.1.1B).

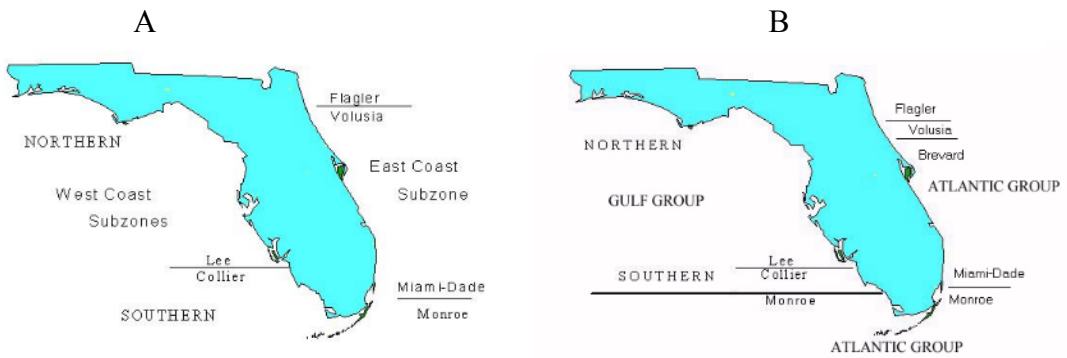

Figure 3.1.1.1. Gulf migratory group king mackerel zones adjacent to Florida for A) November 1 – March 31, and B) April 1 – October 31.

Management measures for the South Atlantic apply to king mackerel from New York to the east coast of Florida. The Atlantic migratory group king mackerel fishing year is March 1 through end of February. This migratory group is divided into Northern and Southern Zones by a line at the North Carolina/South Carolina border.

Commercial landings of Gulf migratory group king mackerel increased as the total commercial quota for the Gulf increased until 1997/1998 when the quota was set at 3.39 million pounds (mp). After that, landings have been relatively steady near the annual catch limit (ACL). Commercial landings of Atlantic king mackerel have decreased in recent years (Table 3.1.1.1).

Table 3.1.1.1. Commercial landings of king mackerel by fishing year.

Fishing Year	Landings (lbs)	
	Gulf	Atlantic
2000/2001	3,056,222	1,932,162
2001/2002	2,902,632	1,686,844
2002/2003	3,184,478	1,856,717
2003/2004	3,095,673	2,774,442
2004/2005	3,215,676	2,243,000
2005/2006	2,984,694	2,991,346
2006/2007	3,231,734	2,656,832
2007/2008	3,459,064	3,105,433
2008/2009	3,834,026	3,560,880
2009/2010	3,672,628	3,402,329
2010/2011	3,521,125	2,051,938
2011/2012	3,427,891	1,346,376
2012/2013	3,538,228	1,346,459
2013/2014	3,055,018	1,116,833
2014/2015	3,591,000	1,324,957

Source: SEFSC, ALS database; NEFSC, CFDBS database.

King mackerel have long been a popular target for recreational fishermen. The recreational sector is allocated 68% of the Gulf ACL and 62.9% of the Atlantic ACL. Gulf recreational landings averaged about 2.8 mp per year over the last five years. The Atlantic migratory group recreational landings in recent years have been lower than previous years (Table 3.1.1.2).

Table 3.1.1.2. Recreational landings of king mackerel by fishing year.

Fishing Year	Landings (lbs)	
	Gulf	Atlantic
2000/2001	3,121,584	6,184,541
2001/2002	3,668,540	5,035,061
2002/2003	2,817,537	4,574,235
2003/2004	3,211,497	4,979,506
2004/2005	2,528,457	5,321,449
2005/2006	2,995,716	4,457,679
2006/2007	3,305,567	5,127,178
2007/2008	2,626,527	7,128,545
2008/2009	2,352,510	4,228,245
2009/2010	3,523,777	4,394,015
2010/2011	2,182,980	2,692,771
2011/2012	2,436,026	1,562,905
2012/2013	2,711,213	1,719,199
2013/2014	2,914,241	1,004,441
2014/2015	4,576,000	1,305,500

Source: SEFSC, MRFSS, SRHS, and TPWD databases.

3.1.2 Status of the Stock

Both the Gulf and Atlantic migratory groups of king mackerel were assessed by the Southeast Data, Assessment, and Review (SEDAR) process in SEDAR 38 (2014). The SEDAR 38 assessment determined the Gulf and Atlantic migratory groups of king mackerel were not overfished and were not experiencing overfishing. Recruitment has been lower in recent years for the Atlantic migratory group, which could be due to physical and/or biological oceanographic variables (e.g., changes in water temperature, timing of upwelling events, changes in current patterns [eddies, gyres, current proximity to shore]), anthropogenic influences, or some combination thereof. The Gulf of Mexico and South Atlantic Fishery Management Councils (Councils) will examine alternatives for the acceptable biological catch for the Atlantic migratory group in Action 2-1 of this document that quantitatively consider this recent potential decline in Atlantic migratory group recruitment. There is no evidence of a similar decline in recruitment for the Gulf migratory group.

3.2 Description of the Physical Environment

3.2.1 Gulf of Mexico

The Gulf has a total area of approximately 600,000 square miles (1.5 million km^2), including state waters (Gore 1992). It is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel. Oceanographic conditions are affected by the Loop Current, discharge of freshwater into the northern Gulf, and a semi-permanent, anti-cyclonic gyre in the western Gulf. The Gulf includes both temperate and tropical waters (McEachran and Fechhelm 2005). Mean annual sea surface temperatures ranged from 73 through 83º F (23-28º C) including bays and bayous (Figure 3.2.1.1) between 1982 and 2009, according to satellite-derived measurements (NODC 2012: http://accession.nodc.noaa.gov/0072888). In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

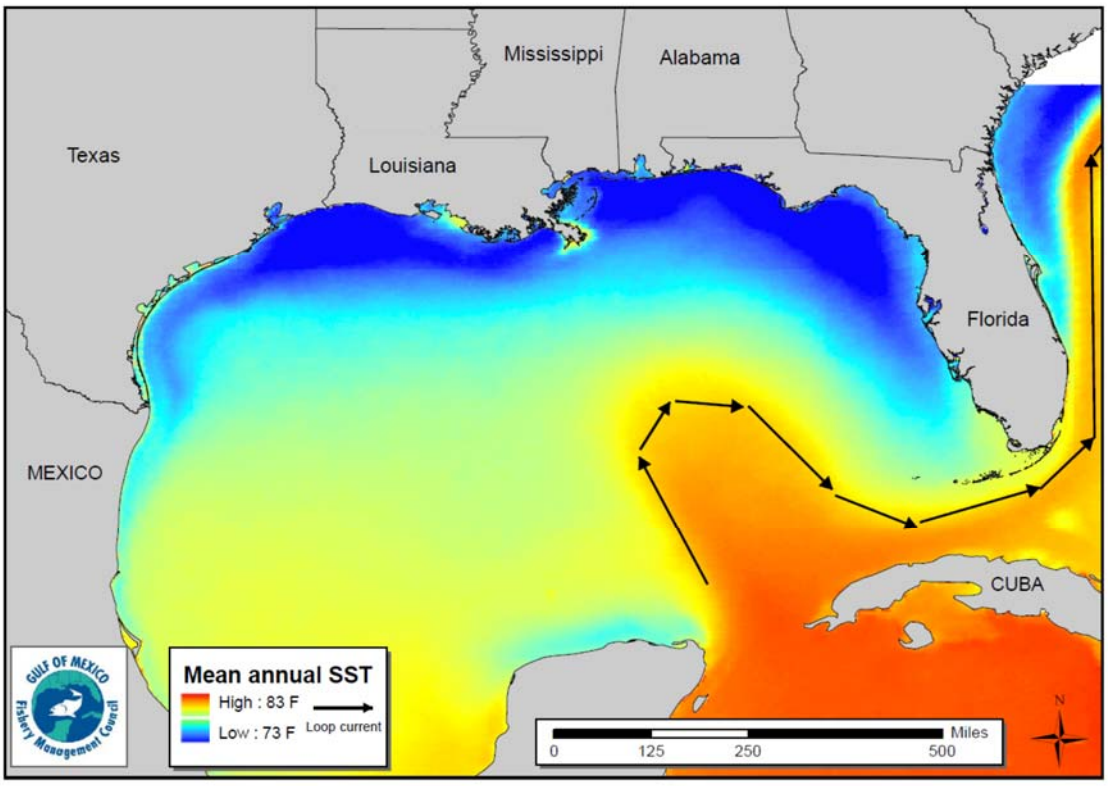

Figure 3.2.1.1. Mean annual sea surface temperature derived from the Advanced Very High Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (http://pathfinder.nodc.noaa.gov).

The physical environment is detailed in the Environmental Impact Statement for the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2005) and the Generic ACLs/

Accountability Measures (AMs) Amendment[3] (GMFMC and SAFMC 2011), which are hereby incorporated by reference and updated below.

In the 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. Historical research indicates that over 2,000 ships sank on the federal outer continental shelf between 1625 and 1951; thousands more sank 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

Habitat Areas of Particular Concern (HAPC)

Generic Amendment 3 (GMFMC 2005) for addressing EFH, HAPC, and adverse effects of fishing in the fishery management plans for Gulf Reef Fish, Red Drum, and CMP is hereby incorporated by reference.

Environmental Sites of Special Interest Relevant to Coastal Migratory Pelagic Species (Figure 3.2.2)

Tortugas North and South Marine Reserves – No-take marine reserves (185 nm^2) cooperatively implemented by Florida, the National Ocean Service, the Gulf of Mexico Fishery Management Council and the National Park Service in Generic Amendment 2 Establishing the Tortugas Marine Reserves (GMFMC 2001). Only a small portion (13 nm^2) of the Tortugas North Marine Reserve is in federal waters while the entire Tortugas South Marine Reserve (54.5 nm^2) is in federal waters.

Reef and bank areas designated as Habitat Areas of Particular Concern (HAPCs) in the northwestern Gulf include – East and West Flower Garden Banks, Stetson Bank, and McGrail Bank - Pristine coral areas protected by preventing the use of some fishing gear that interacts with the bottom and prohibited use of anchors (totaling 80.4 nm^2). Subsequently, three of these areas were established as marine sanctuaries (i.e., East and West Flower Garden Banks and Stetson Bank). Bottom anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots on coral reefs are prohibited in the East and West Flower Garden Banks, McGrail Bank, and on significant coral resources on Stetson Bank (GMFMC 2005). Sonnier Bank, MacNeil Bank, 29 Fathom, Rankin Bright Bank, Geyer Bank, Bouma Bank, Rezak Sidner Bank, Alderice Bank, and Jakkula Bank (totaling 183 nm^2) are other areas that have been designated as HAPCs but currently have no regulations associated with them. A weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf exclusive economic zone (EEZ) is required. A weak link is defined as a length or section of the tickler chain that has a breaking strength less than the chain itself and is easily seen as such when visually inspected. An education program

[3] Final Generic Annual Catch Limits/Accountability Measures Amendment for the Gulf of Mexico Fishery Management Council's Red Drum, Reef Fish, Shrimp, Coral and Coral Reefs Fishery Management Plans.

for the protection of coral reefs when using various fishing gears in coral reef areas for recreational and commercial fishermen was also developed.

Pulley Ridge HAPC – A portion (101 nm^2) of the HAPC (2,300 nm^2 or 4,259 km^2) where deepwater hermatypic coral reefs are found is closed to anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots (GMFMC 2005).

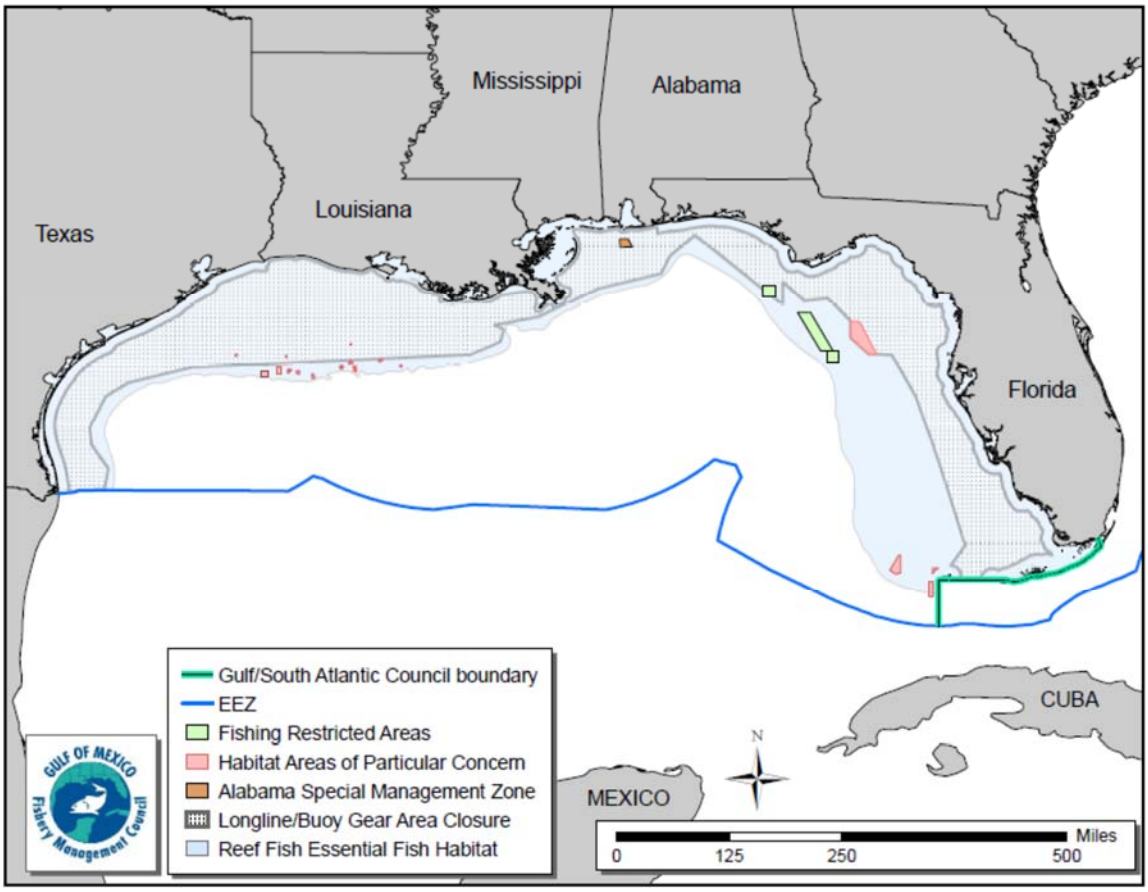

Figure 3.2.2. Map of most fishery management closed areas in the Gulf.

Deepwater Horizon MC252 Oil Spill Incident

Overview

On April 20, 2010, an explosion occurred on the *Deepwater Horizon* semi-submersible oil rig approximately 36 nautical miles (41 statute miles) off the Louisiana coast. Two days later the rig sank. An uncontrolled oil leak from the damaged well continued for 87 days until the well was successfully capped by British Petroleum on July 15, 2010. The *Deepwater Horizon* MC252 oil spill affected at least one-third of the Gulf area from western Louisiana east to the Florida Panhandle and south to the Campeche Bank in Mexico (Figure 3.3.1).

As reported by the National Oceanic and Atmospheric Administration Office of Response and Restoration (NOAA 2010), the oil from the *Deepwater Horizon* MC252 oil spill is relatively high in alkanes which can readily be used by microorganisms as a food source. As a result, the

oil from this spill is likely to biodegrade more readily than crude oil in general. The *Deepwater Horizon* MC252 oil is also relatively much lower in polycyclic aromatic hydrocarbons. Polycyclic aromatic hydrocarbons are highly toxic chemicals that tend to persist in the environment for long periods of time, especially if the spilled oil penetrates into the substrate on beaches or shorelines. Like all crude oils, *Deepwater Horizon* MC252 oil contains volatile organic compounds (VOCs) such as benzene, toluene, and xylene. Some VOCs are acutely toxic, but because they evaporate readily, they are generally a concern only when oil is fresh (http://sero.nmfs.noaa.gov/sf/deepwater_horizon/OilCharacteristics.pdf).

In addition to the crude oil, over one million gallons of the dispersant, Corexit 9500A®, was applied to the ocean surface and an additional hundreds of thousands of gallons of dispersant was pumped to the mile-deep well head (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted prior to the *Deepwater Horizon* MC252 oil spill.

Oil could exacerbate the development of the hypoxic "dead" zone in the Gulf, similar in effect as higher than normal input of water laden with fertilizer runoff from the Mississippi River basin. For example, oil on the surface of the water could restrict the normal process of atmospheric oxygen mixing into and replenishing oxygen concentrations in the water column. In addition, microbes in the water that break down oil and dispersant consume oxygen; this metabolic process further depletes oxygen in the adjacent waters.

General Impacts on Fishery Resources

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

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

The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern. Marine fish species typically concentrate PAHs in the digestive tract, making stomach bile an appropriate testing medium. A study by Synder et al. (2015)

assessed bile samples from golden tilefish (*Lopholatilus chamaeleonticeps*), king snake eel (*Ophichthus rex*), and red snapper for PAH accumulation over time, and reported concentrations were highest in golden tilefish during the same time period when compared to king snake eel and red snapper. These results suggest that the more highly associated an organism is with the sediment in an oil spill area, the higher the likelihood of toxic PAH accumulation. Twenty-first century dispersant applications are thought to be less harmful than their predecessors. However, the combination of oil and dispersants has proven to be more toxic to marine fishes than either dispersants or crude oil alone. Marine fish which are more active (e.g., a pelagic species versus a demersal species) appear to be more susceptible to negative effects from interactions with weathered oil/dispersant emulsions. These effects can include mobility impairment and inhibited respiration (Swedmark et al. 1973). Another study found that while Corexit 9500A® and oil are similar in their toxicity, when Corexit 9500A® and oil were mixed in lab tests, toxicity to microscopic rotifers increased up to 52-fold (Rico-Martínez et al. 2013). These studies suggest that the toxicity of the oil and dispersant combined may be greater than anticipated.

3.2.2 South Atlantic

The South Atlantic Council has management jurisdiction of the federal waters (3-200 nm) offshore of North Carolina, South Carolina, Georgia, and Florida. Management of CMP species extends through the Mid-Atlantic region, which is discussed below. Data on the physical environment for the South Atlantic in this section encompasses the area from the Dry Tortugas, Florida, to Cape Hatteras, North Carolina.

South Atlantic Region

The continental shelf from the Dry Tortugas, Florida, to Miami, Florida, is approximately 25 kilometers (km) wide and narrows to approximately 5 km off Palm Beach, Florida. The shelf then broadens to approximately 120 km off Georgia and South Carolina before narrowing to 30 km off Cape Hatteras, North Carolina. The Florida Current/Gulf Stream flows along the shelf edge throughout the region. In the southern region, this boundary current dominates the physics of the entire shelf (Lee et al. 1994).

North of Cape Canaveral, Florida, to Cape Hatteras, North Carolina, additional physical processes are important and the shelf environment can be subdivided into three oceanographic zones (Atkinson et al. 1985; Menzel 1993), the outer shelf, mid-shelf, and inner shelf. The outer shelf (40-75 m) is influenced primarily by the Gulf Stream and secondarily by winds and tides. On the mid-shelf (20-40 m), the water column is almost equally affected by the Gulf Stream, winds, and tides. Inner shelf waters (0-20 m) are influenced by freshwater runoff, winds, tides, and bottom friction. Water masses present from the Dry Tortugas, Florida, to Cape Canaveral, Florida, include Florida Current water, waters originating in Florida Bay, and shelf water. From Cape Canaveral, Florida, to Cape Hatteras, North Carolina four water masses are found: Gulf Stream water; Carolina Capes water; Georgia water; and Virginia coastal water.

Spatial and temporal variation in the position of the western boundary current has dramatic effects on water column habitats. Variation in the path of the Florida Current near the Dry Tortugas induces formation of the Tortugas Gyre (Lee et al. 1994). This cyclonic eddy has horizontal dimensions of approximately 100 km and may persist near the Florida Keys for several months. The Pourtales Gyre, which has been found to the east, is formed when the Tortugas Gyres moves eastward along the shelf. Upwelling occurs in the center of these gyres,

thereby adding nutrients to the near surface (<100 m) water column. Wind and input of Florida Bay water also influence the water column structure on the shelf off the Florida Keys (Smith 1994; Wang et al. 1994). Further, downstream, the Gulf Stream encounters the "Charleston Bump", a topographic rise on the upper Blake Ridge where the current is often deflected offshore resulting in the formation of a cold, quasi-permanent cyclonic gyre and associated upwelling (Brooks and Bane 1978). On the continental shelf, offshore projecting shoals at Cape Fear, North Carolina, Cape Lookout, North Carolina, and Cape Hatteras, North Carolina affect longshore coastal currents and interact with Gulf Stream intrusions to produce local upwelling (Blanton et al. 1981; Janowitz and Pietrafesa 1982). Shoreward of the Gulf Stream, seasonal horizontal temperature and salinity gradients define the mid-shelf and inner-shelf fronts. In coastal waters, river discharge and estuarine tidal plumes contribute to the water column structure.

The water column from Dry Tortugas, Florida, to Cape Hatteras, North Carolina, serves as habitat for many marine fish and shellfish. Most marine fish and shellfish release pelagic eggs when spawning and thus, most species utilize the water column during some portion of their early life history (Leis 1991; Yeung and McGowan 1991). Many fish inhabit the water column as adults. Pelagic fishes include numerous clupeoids, flying fish, jacks, cobia, bluefish, dolphin, barracuda, and the mackerels (Schwartz 1989). Some pelagic species are associated with particular benthic habitats, while other species are truly pelagic.

In the South Atlantic, areas of unique habitat exist such as the Oculina Bank and large expanses of deepwater coral; however, regulations are currently in place to protect these areas. Additionally, there are several notable shipwrecks along the South Atlantic coast in state and federal waters including Lofthus (eastern Florida), SS Copenhagen (southeast Florida), Half Moon (southeast Florida), Hebe (Myrtle Beach, South Carolina), Georgiana (Charleston, South Carolina), Monitor (Cape Hatteras, North Carolina), Huron (Nags Head, North Carolina), and Metropolis (Corolla, North Carolina). The South Atlantic coastline is also home to numerous marshes and wetland ecosystems; however, these sensitive ecological environments do not extend into federal waters of the South Atlantic. The proposed actions are not expected to alter fishing practices in any manner that would affect any of the above listed habitats or historic resources, nor would it alter any regulations intended to protect them.

Mid-Atlantic Region

Information about the physical environment of the Mid-Atlantic region was provided by the Mid-Atlantic Fishery Management Council and adapted from the 2016 Mackerel, Squid, and Butterfish Specifications Environmental Assessment, available at: http://www.greateratlantic.fisheries.noaa.gov/regs/2016/January/16msb2016specspr.html.

Climate, physiographic, and hydrographic differences separate the Atlantic Ocean from Maine to Florida into the New England-Middle Atlantic Area and the South Atlantic Area (division/mixing at Cape Hatteras, NC). The inshore New England-Middle Atlantic area is fairly uniform physically and is influenced by many large coastal rivers and estuarine areas. The continental shelf (characterized by water less than 650 ft. in depth) extends seaward approximately 120 miles off Cape Cod, narrows gradually to 70 miles off New Jersey, and is 20 miles wide at Cape Hatteras. Surface circulation is generally southwesterly on the continental shelf during all seasons of the year, although this may be interrupted by coastal indrafting and some reversal of flow at the northern and southern extremities of the area. Water temperatures

range from less than 33 ºF from the New York Bight north in the winter to over 80 ºF off Cape Hatteras in summer.

Within the New England-Middle Atlantic Area, the Northeast U.S. Continental Shelf Large Marine Ecosystem includes the area from the Gulf of Maine to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream. The Northeast U.S. Continental Shelf Large Marine Ecosystem is a dynamic, highly productive, and intensively studied system providing a broad spectrum of ecosystem goods and services. This region, encompassing the continental shelf area between Cape Hatteras and the Gulf of Maine, spans approximately 250,000 km^2 and supports some of the highest revenue fisheries in the U.S. The system historically underwent profound changes due to very heavy exploitation by distant-water and domestic fishing fleets. Further, the region is experiencing changes in climate and physical forcing that have contributed to large-scale alteration in ecosystem structure and function. Projections indicate continued future climate change related to both short and medium terms cyclic trends as well as non-cyclic climate change.

A number of distinct subsystems comprise the region. The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and fast-moving currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. Detailed information on the affected physical and biological environments inhabited by the managed resources is available in Stevenson et al. (2006).

3.3 Description of the Biological Environment

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

3.3.1 King Mackerel

King mackerel is a marine pelagic species that is found throughout the western Atlantic from the Gulf of Maine to Brazil, including the Gulf and Caribbean Sea, and from the shore to 200 m (656 ft) depths. The habitat of adults is the coastal waters out to the edge of the continental shelf. Within the area, the occurrence of king mackerel is governed by temperature and salinity. They are seldom found in water temperatures less than 20°C; salinity preference varies, but they generally prefer high salinity, less than 36 parts per thousand.

Adults are migratory, and the CMP FMP recognizes two migratory groups (Gulf and Atlantic). Typically, adult king mackerel are found in the southern climates (south Florida and extreme south Texas/Mexico) in the winter and farther north in the summer; however, some king mackerel overwinter in deeper waters off the mouth of the Mississippi River, and off the coast of North Carolina. Food availability and water temperature are likely causes of these migratory

patterns. King mackerel have longevities of 24 to 26 years for females and 23 years for males (GMFMC and SAFMC 1985; MSAP 1996; Brooks and Ortiz 2004).

Adults are known to spawn in areas of low turbidity, with salinity and temperatures of approximately 30 ppt and 27°C, respectively. There are major spawning areas off Louisiana and Texas in the Gulf (McEachran and Finucane 1979); and off the Carolinas, Cape Canaveral, and Miami in the western Atlantic (Wollam 1970; Schekter 1971; Mayo 1973). Spawning occurs generally from May through October with peak spawning in September (McEachran and Finucane 1979). Eggs are believed to be released and fertilized continuously during these months. Fifty percent of females are sexually mature between 450 to 499 mm (17.7 to 19.6 inches) in length and most are mature by the time they are 800 mm (35.4 inches) in length, or by about age 4. Fifty percent of males are sexually mature at age 3, at a length of 718 mm (28.3 inches). Females in U.S. waters, between the sizes of 446-1,489 mm (17.6 to 58.6 inches) release 69,000-12,200,000 eggs.

Larvae of king mackerel have been found in waters with temperatures between 26-31° C (79-88° F). This larval developmental stage has a short duration. King mackerel can grow up to 0.54-1.33 mm (0.02 to 0.05 inches) per day. This shortened larval stage decreases the vulnerability of the larvae, and is related to the increased metabolism of this fast-swimming species. Juveniles are generally found closer to shore than adults and occasionally in estuaries.

3.3.2 Bycatch Species

Species taken incidentally during king mackerel fishing are discussed in the Bycatch Practicability Analysis in Appendix F.

3.3.3 Protected Species

Species in the Gulf and South Atlantic protected under the Endangered Species Act (ESA) include: seven marine mammal species (blue, sei, fin, humpback, sperm, North Atlantic right whales and manatees); five sea turtle species (Kemp's ridley, loggerhead, green, leatherback, and hawksbill); four fish species (Gulf sturgeon, smalltooth sawfish, shortnose sturgeon, and Atlantic sturgeon); and seven coral species (elkhorn, staghorn, lobed star, knobby star, mountainous star, pillar, and rough cactus).

In a 2015 biological opinion, the National Marine Fisheries Service (NMFS) determined CMP fishing in the Southeastern United States was not likely to jeopardize the continued existence of endangered sea turtles, Atlantic sturgeon, or smalltooth sawfish (NMFS 2015). Other listed species are not likely to be adversely affected, including ESA-listed whales, Gulf sturgeon, and Acropora corals. In addition, the CMP fishery is not likely to adversely affect designated critical habitats for elkhorn and staghorn corals or loggerhead sea turtles, and will have no effect on designated critical habitat for North Atlantic right whale.

The Gulf and South Atlantic CMP hook-and-line fishery is classified in the 2015 Marine Mammal Protection Act List of Fisheries as a Category III fishery (79 FR 77919), meaning the annual mortality and serious injury of a marine mammal resulting from the fishery is less than or equal to 1% of the maximum number of animals, not including natural moralities, that may be

removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The Gulf and South Atlantic CMP gillnet fishery is classified as Category II fishery in the 2015 Marine Mammal Protection Act List of Fisheries. This classification indicates an occasional incidental mortality or serious injury of a marine mammal stock resulting from the fishery (1-50% annually of the potential biological removal). The fishery has no documented interaction with marine mammals; NMFS classifies this fishery as Category II based on analogy (i.e., similar risk to marine mammals) with other gillnet fisheries.

3.4 Description of the Economic Environment

3.4 Description of the Economic Environment

3.4.1 Economic Description of the Commercial Sector

An economic description of the commercial sector for the CMP species is contained in Vondruska (2010) and is incorporated herein by reference. Updated select summary statistics are contained in Amendment 20B (GMFMC and SAFMC 2014) for king mackerel and Framework Amendment 3 (GMFMC and SAFMC 2015) for the king mackerel gillnet segment of the CMP fishery, and are incorporated herein by reference.

Permits
Any fishing vessel that harvests and sells Gulf or Atlantic migratory group king mackerel must have a valid commercial king mackerel permit. The commercial king mackerel permit is a limited access permit that can be transferred or sold, subject to certain conditions. There is only one permitting system for the commercial harvest of Gulf or Atlantic migratory groups of king mackerel. In addition, a king mackerel gillnet permit, which is an endorsement attached to a Gulf commercial king mackerel permit, is required to harvest king mackerel using gillnets in the Gulf Southern Zone. The gillnet permit is also a limited access permit and is subject to more restrictive transferability conditions than the commercial king mackerel permit. After any permit expires, it can be renewed and transferred up to one year after it expires. Beginning in 2014, a federal dealer permit has been required to purchase Gulf or Atlantic king mackerel (among other species) from vessels harvesting the species.

From 2008 through 2014, the number of commercial king mackerel permits decreased from 1,619 to 1,478, with an average of 1,534 during this period (NMFS SERO Permits Data, retrieved April, 2015). As of January 13, 2016, there were 1,448 valid or renewable commercial king mackerel permits. From 2008 through 2014, there were an average of 23 king mackerel gillnet permits (NMFS SERO Permits Data, retrieved April, 2015); at present, there are 17 valid or renewable king mackerel gillnet permits. As of January 13, 2016, there were 410 dealer permits.

King Mackerel Annual Landings and Revenues
The commercial king mackerel fishing fleet in the Gulf, South Atlantic and Mid-Atlantic is composed of vessels using primarily hook and line gear. Gillnets have also been used, but are now limited in the Gulf to the Southern Zone. Gillnets are not considered an allowable gear for harvesting South Atlantic group king mackerel except north of Cape Lookout, North Carolina. Other gear types, such as gigs and spears, traps/pots, have accounted for a very small portion of the total king mackerel landings in the Gulf, South Atlantic, and Mid-Atlantic. Table 3.4.1.1 shows landings and dockside revenues for the Gulf and Atlantic migratory groups of king mackerel. The long-term (2000/01-2013/14) average landings and dockside revenues were approximately 3.35 mp and $5.65 million for the Gulf group and 2.35 mp and $4.97 million for the Atlantic group king mackerel. Their short-term (2009/2010-2013/2014) counterparts are 3.54 mp valued at $6.31 million for the Gulf group and 2.30 mp valued at $4.91 million for the Atlantic group. Price per pound is relatively higher in the Atlantic region.

Table 3.4.1.1. King mackerel landings, dockside revenues, and price per pound by migratory group, 2000/01-2013/14. Revenues and price per pound are in 2014 dollars.

Fishing Year	Gulf Migratory Group			Atlantic Migratory Group		
	Pounds	Revenues	Price/lb	Pounds	Revenues	Price/lb
2000/01	3,070,473	$5,376,506	$1.75	2,148,262	$5,092,006	$2.37
2001/02	2,927,704	$4,828,499	$1.65	1,933,172	$4,459,597	$2.31
2002/03	3,221,656	$4,938,643	$1.53	1,687,709	$3,696,381	$2.19
2003/04	3,178,121	$5,207,577	$1.64	1,860,064	$3,471,749	$1.87
2004/05	3,225,765	$5,190,696	$1.61	2,776,748	$5,487,732	$1.98
2005/06	3,008,585	$4,929,633	$1.64	2,249,711	$4,861,494	$2.16
2006/07	3,231,883	$5,305,649	$1.64	2,992,672	$6,041,002	$2.02
2007/08	3,489,904	$5,930,478	$1.70	2,664,751	$5,734,915	$2.15
2008/09	3,860,618	$5,852,968	$1.52	3,105,889	$6,114,044	$1.97
2009/10	3,804,028	$6,059,164	$1.59	3,561,139	$6,506,967	$1.83
2010/11	3,530,905	$6,277,473	$1.78	3,402,677	$6,118,822	$1.80
2011/12	3,457,114	$5,979,250	$1.73	2,052,139	$5,048,520	$2.46
2012/13	3,627,429	$6,917,871	$1.91	1,346,459	$3,612,517	$2.68
2013/14	3,259,687	$6,340,204	$1.95	1,141,601	$3,274,106	$2.87
Avg (2000-14)	3,349,562	$5,652,472	$1.69	2,351,642	$4,965,704	$2.11
Avg (2009-14)	3,535,833	$6,314,792	$1.79	2,300,803	$4,912,186	$2.13

Fishing year for the Gulf migratory group is July 1- June 30; fishing year for the Atlantic group is March 1-February 28. Note that some sub-zones have different open and closure dates than the general fishing year.
Source: SEFSC ACL_FILES_08262015.

King Mackerel Trip Level Landings and Dockside Revenues

Information in the tables below is based on logbook data, supplemented with Accumulated Landings System (ALS) price data, and so would not exactly match with landings and revenues shown in the earlier table. The information is also presented in calendar rather than fishing year; moreover, landings are in gutted weight for all species. Using logbook data provides additional information regarding the number of vessels landing king mackerel, the number of trips they took with or without catching king mackerel, and other species they landed. Logbook data also provides more detailed revenue information of vessels landing king mackerel.

From 2010 through 2014, an annual average of 274 vessels took 2,019 commercial trips that combined landed an average of 1.97 mp of king mackerel in the Gulf annually with a dockside value (2014 dollars) of $3.99 million (Tables 3.4.1.2-3.4.1.3). The corresponding numbers for the South Atlantic are 736 vessels, 10,293 trips, and 2.49 mp of king mackerel valued at $5.84 million (Tables 3.4.1.4-3.4.1.5). Including revenues from all sources, the average revenue per vessel is $66,952 in the Gulf and $27,817 in the South Atlantic. Revenues from king mackerel accounted for approximately 22% in the Gulf and 29% in the South Atlantic of all vessel revenues from all species, including king mackerel, landed by these vessels. Gulf vessels received an average price of $1.69 ($1.79 for 2009-2014) per pound whereas South Atlantic vessels received $2.11 ($2.13 for 2009-2014) per pound.

Table 3.4.1.2. Vessels and trips with king mackerel landings by weight (lb gw), Gulf, 2010–2014.

Year	# of vessels landing king mackerel	# of trips landing king mackerel	Total king mackerel landings	Landings of other species jointly caught w/ king mackerel	# of trips only catching other species	Landings of other species on trips w/o king mackerel
2010	277	1,710	1,859,629	692,630	1,868	3,414,763
2011	290	2,006	2,194,213	589,794	2,248	4,827,227
2012	287	2,162	1,932,385	597,163	2,074	4,289,260
2013	267	2,161	1,932,985	661,216	1,731	3,882,970
2014	251	2,055	1,923,477	615,797	1,659	3,679,388
Average	274	2,019	1,968,538	631,320	1,916	4,018,722

Source: SEFSC SSRG Socioeconomic Panel Data.

Table 3.4.1.3. Dockside revenues (2014 $) from all sources for vessels that landed king mackerel, Gulf, 2010–2014.

Year	# vessels landing king mackerel	King mackerel dockside revenue	Dockside revenue from 'other species' jointly landed w/ king mackerel	Dockside revenue from 'other species' landed on trips w/o king mackerel	Total dockside revenue	Average total dockside revenue per vessel
2010	277	$3,406,889	$1,932,394	$10,199,121	$15,538,403	$56,095
2011	290	$4,179,067	$1,621,765	$13,405,114	$19,205,945	$66,227
2012	287	$3,835,865	$1,767,242	$12,756,897	$18,360,004	$63,972
2013	267	$4,523,592	$2,390,622	$13,520,400	$20,434,614	$76,534
2014	251	$3,992,941	$1,964,070	$12,097,171	$18,054,182	$71,929
Average	274	$3,987,671	$1,935,219	$12,395,741	$18,318,630	$66,952

Source: SEFSC SSRG Socioeconomic Panel Data.

Table 3.4.1.4. Vessels and trips with king mackerel landings by weight (lb gw), South Atlantic, 2010–2014.

Year	# of vessels landing king mackerel	# of trips landing king mackerel	King mackerel landings	Landings of other species jointly caught w/ king mackerel	# of trips only catching other species	Landings of other species on trips w/o king mackerel
2010	809	13,318	3,660,905	1,100,091	9,857	6,450,140
2011	782	11,495	2,873,480	1,043,514	10,496	6,727,411
2012	752	9,743	2,321,424	894,894	10,221	6,016,318
2013	688	8,058	1,701,836	906,839	10,305	5,638,630
2014	648	8,849	1,878,948	840,880	9,823	5,455,512
Average	736	10,293	2,487,319	957,244	10,140	6,057,602

Source: SEFSC SSRG Socioeconomic Panel Data.

Table 3.4.1.5. Dockside revenues (2014 $) from all sources for vessels that landed king mackerel, South Atlantic, 2010–2014.

Year	# vessels landing king mackerel	King mackerel dockside revenue	Dockside revenue from 'other species' jointly landed w/ king mackerel	Dockside revenue from 'other species' landed on trips w/o king mackerel	Total dockside revenue	Average total dockside revenue per vessel
2010	809	$7,301,155	$2,116,406	$12,134,546	$21,552,108	$26,640
2011	782	$6,572,753	$1,844,602	$12,733,174	$21,150,529	$27,047
2012	752	$5,503,796	$1,695,435	$13,011,220	$20,210,451	$26,876
2013	688	$4,808,125	$2,111,889	$13,303,731	$20,223,744	$29,395
2014	648	$5,027,826	$1,675,816	$12,171,537	$18,875,179	$29,128
Average	736	$5,842,731	$1,888,830	$12,670,841	$20,402,402	$27,817

Source: SEFSC SSRG Socioeconomic Panel Data.

A similar tabulation of trip level information for the Mid-Atlantic states is not available. It is noted that king mackerel landings in this particular area have been relatively low, and information at the trip/vessel level would be confidential.

Dealers

As noted, a federal dealer permit was not required to purchase Gulf or Atlantic king mackerel from commercial vessels until 2014, and as of January 13, 2016, 410 such dealer permits were issued. However, information about dealer purchases has been routinely collected by SEFSC. In 2013 (latest available), 219 dealers purchased approximately 4.30 mp king mackerel from fishermen valued at $10.09 million (2014 dollars). The distribution of these dealers and their respective king mackerel purchases is: 6 dealers in Alabama--$496 thousand; 145 dealers in Florida--$8.37 million; 3 dealers in Louisiana--$250 thousand; 52 dealers in North Carolina--$905 thousand; 9 dealers in South Carolina--$16 thousand; 4 combined dealers in Georgia, Mississippi, Texas and other states--$51 thousand.

Commercial Sector Business Activity
Estimates of the business activity (economic impacts) in the U.S. associated with the Gulf and Atlantic king mackerel harvests were derived using the model developed for and applied in NMFS (2011). Business activity for the commercial sector is characterized in the form of jobs, income impacts (wages, salaries, and self-employed income), and output (sales) impacts (gross business sales). Income impacts should not be added to output (sales) impacts because this would result in double counting. The estimates of economic activity include the direct effects (effects in the sector where an expenditure is actually made), indirect effects (effects in sectors providing goods and services to directly affected sectors), and induced effects (effects induced by the personal consumption expenditures of employees in the direct and indirectly affected sectors).

Vessels that harvested king mackerel also harvested other species on trips where king mackerel were harvested. These vessels also took trips during the year where only species other than king mackerel were caught. All revenues from all species on all these trips contributed towards making these vessels economically viable and contribute to the economic activity associated with these vessels. The average annual total ex-vessel revenues from king mackerel and from all species (including king mackerel) and their associated economic activities are presented in Table 3.4.1.6.

Table 3.4.1.6. Average annual business activity associated with vessels that harvest Gulf or Atlantic king mackerel, 2010-2014. Dollar values are in 2014 dollars.

Species	Average Annual Dockside Revenue (millions)	Total Jobs	Harvester Jobs	Output (Sales) Impacts (millions)	Income Impacts (millions)
Gulf king mackerel	$6.31	1,138	149	$83.14	$35.43
Gulf, All species[1]	$18.32	3,304	431	$241.19	$102.79
Atlantic king mackerel	$4.91	886	115	$64.68	$27.57
South Atlantic, All species[1,2]	$20.40	3,680	480	$268.63	$114.49

[1]Includes dockside revenues and economic activity associated with the average annual harvests of all species, including king mackerel, landed by vessels that harvested king mackerel.
[2]Does not include species other than king mackerel for vessels in the Mid-Atlantic as data at this level of resolution is not available.
Source: Economic impact results calculated by NMFS SERO using the model developed for NMFS (2011).

Imports
Information on the imports of all mackerel species (fresh, frozen, or other product forms) are available at: http://www.st.nmfs.noaa.gov/st1/trade/cumulative_data/TradeDataProduct.html. Information on the imports of individual mackerel species is not available. In 2012, imports of mackerel species (fresh, frozen, salted, smoked) were approximately 44.18 mp valued at

approximately $64.97 million (2014 dollars). These amounts are contrasted with the domestic harvest of all mackerel species in the U.S. in 2012 of approximately 138.03 mp (includes all mackerel) valued at approximately $37.97 million (2014 dollars; data available at: http://www.st.nmfs.noaa.gov/commercial-fisheries/publications/index). Although the levels of domestic production and imports are not totally comparable for several reasons, including considerations of different product form such as fresh versus frozen, and possible product mislabeling, the difference in the magnitude of imports relative to amount of domestic harvest is indicative of the dominance of imports in the domestic market in terms of poundage but not in terms of dollar values. Final comparable data for more recent years is not currently available.

3.4.2 Economic Description of the Recreational Sector

The following focuses on recreational landings and effort (angler trips) for king mackerel. The major sources of data summarized in this description are the Recreational ACL Dataset (SEFSC MRIPACLspec_rec81_14wv4_30Oct14) for landings and the NOAA fisheries website for accessing recreational data (http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index) for effort. Additional information on the recreational sector of the CMP fishery contained in previous amendments is incorporated herein by reference [see Amendment 20A, Amendment 20B, Framework Amendments 1, 2, and 3, South Atlantic Framework 2013].

The recreational sector is comprised of a private component and a for-hire component. The private component includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire component is composed of charter boats and headboats (also called partyboats).

Permits

Although charter boats tend to be smaller, on average, than headboats, the key distinction between the two types of operations is how the fee is determined. On a charter boat trip, the fee charged is for the entire vessel, regardless of how many passengers are carried, whereas the fee charged for a headboat trip is paid per individual angler.

A federal charter/headboat (for-hire) vessel permit has been required for harvesting CMP species, including king mackerel, when fishing on for-hire vessels. The Gulf for-hire permit is a limited access system whereas the South Atlantic for-hire permit is an open access system. As of January 13, 2016, there were 1,288 valid (non-expired) or renewable Gulf charter/headboat pelagic fish permits, 34 historical captain charter/headboat pelagic fish permits, and 1,419 South Atlantic charter/headboat pelagic fish permits. A renewable permit is an expired permit that may not be actively fished, but is renewable for up to one year after expiration. Although the for-hire permit application collects information on the primary method of operation, the resultant permit itself does not identify the permitted vessel as either a headboat or a charter boat, operation as either a headboat or charter boat is not restricted by the permitting regulations, and vessels may operate in both capacities. However, only selected headboats are required to submit harvest and effort information to the NMFS Southeast Region Headboat Survey (SRHS). Participation in the SRHS is based on determination by the SEFSC that the vessel primarily operates as a headboat. There were 69 Gulf vessels and 77 South Atlantic vessels registered in the SRHS as of April 24, 2015 (K. Fitzpatrick, NMFS SEFSC, pers. Comm.).

Information on charter boat and headboat operating characteristics, including average fees and net operating revenues, is included in Savolainen et al. (2012) for Gulf vessels and Holland et al. (2012) for South Atlantic vessels, and is incorporated herein by reference.

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

Harvest

Recreational landings of king mackerel for both Gulf and South Atlantic migratory groups are presented in Table 3.4.2.1. On average, the recreational sector landed 3.589 mp (2.661 mp for 2009-2014) of Gulf king mackerel and 4.138 mp (2.179 mp for 2009-2014) of South Atlantic king mackerel.

Table 3.4.2.1. Annual recreational landings (mp ww) of Gulf and Atlantic migratory groups of king mackerel, 2000/01- 2013/14.

Fishing Year	Gulf Landings	Atlantic Landings
2000/01	5.061	6.185
2001/02	5.163	5.035
2002/03	4.764	4.574
2003/04	4.296	4.980
2004/05	3.260	5.321
2005/06	3.317	4.458
2006/07	4.459	5.127
2007/08	3.471	7.129
2008/09	3.146	4.228
2009/10	2.391	4.394
2010/11	2.183	2.693
2011/12	2.547	1.449
2012/13	3.593	1.239
2013/14	2.592	1.121
Average (2000/01-2013/14)	3.589	4.138
Average (2009/10-2013/14)	2.661	2.179

Source: SEDAR 38 for fishing years 2000/01-2010/11; SEFSC MRIPACLspec_rec81_13wv4_30Oct14 for fishing years 2011/12-2013/14.

Effort

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

Target effort – The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or second primary target for the trip. The species did not have to be caught.

Catch effort – The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.

Total recreational trips – The total estimated number of recreational trips in the Gulf, regardless of target intent or catch success.

Other measures of effort are possible, such as the number of harvest trips (the number of individual angler trips that harvest a particular species regardless of target intent), and directed trips (the number of individual angler trips that either targeted or caught a particular species), among other measures, but the three measures of effort listed above are used in this assessment.

Estimates of the average annual king mackerel effort (in terms of individual angler trips) for 2010-2014 are provided in Table 3.4.2.2 for the Gulf states and Table 3.4.2.3 for the South Atlantic states. It is noted that the MRFSS/MRIP data collection system does not include Texas, so no comparable target or catch effort are presented for this state. Target and catch trips are shown by fishing mode (charter, private/rental, shore) for each state. Estimates of king mackerel target and catch trips for additional years, and other measures of directed effort, are available at http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.

Table 3.4.2.2. Average (2010-2014) king mackerel target and catch effort, Gulf states*.

Fishing Mode	Target Trips				
	Alabama	W. Florida	Louisiana	Mississippi	Total
Charter	4,421	25,894	0	327	30,642
Private	35,422	143,945	177	681	180,225
Shore	107,003	153,426	0	0	260,429
Total	146,847	323,264	177	1,008	471,296
	Catch Trips				
	Alabama	W. Florida	Louisiana	Mississippi	Total
Charter	20,697	99,357	1,188	1,610	122,853
Private	32,289	113,316	2,734	4,926	153,266
Shore	16,849	32,069	0	0	48,918
Total	69,835	244,743	3,922	6,537	325,037

*No similar effort data are presented for Texas, because MRFSS/MRIP does not collect effort data from Texas
Source: http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.

Table 3.4.2.3. Average (2010-2014) king mackerel target and catch effort, South Atlantic states.

Fishing Mode	Target Trips				
	E. Florida	Georgia	N. Carolina	S. Carolina	Total
Charter	5,545	34	510	917	7,007
Private	175,860	6,433	60,785	13,538	256,616

Shore	27,420	0	43,273	41,865	112,559
Total	208,826	6,468	104,568	56,320	376,182
	Catch Trips				
	E. Florida	Georgia	N. Carolina	S. Carolina	Total
Charter	26,533	58	3,676	545	30,812
Private	101,974	2,021	16,352	4,026	124,372
Shore	5,290	0	2,071	1,481	8,842
Total	133,797	2,079	22,099	6,052	164,027

Source: http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.

Reported target and catch trips for king mackerel in the Mid-Atlantic states have been relatively low. For the period 2010-2014, the average target trips for king mackerel in the Mid-Atlantic were 13 for the charter mode, 1,351 for the private/rental mode, and 2,339 for the shore mode. Catch trips were even much lower at 7 for the charter mode, 9 for the private/rental mode, and none for the shore mode. Noting that in the Mid-Atlantic states headboat trips for king mackerel have been very low, they are combined with charter trips for reporting purposes in this section.

Because of the *Deepwater Horizon* MC252 oil spill, 2010 was not a typical year for recreational fishing in the Gulf due to the extensive closures and associated decline in fishing in much of the Gulf. For information on the *Deepwater Horizon* MC252 oil spill and associated closures, see: http://sero.nmfs.noaa.gov/deepwater_horizon_oil_spill.htm.

Headboat data for the Southeast do not support the estimation of target or catch effort because target intent is not collected and the harvest data (the data reflect only harvest information and not total catch) are collected on a vessel basis and not by individual angler. Table 3.4.2.4 contains estimates of the number of headboat angler days for all Gulf and South Atlantic states for 2010-2014.

Table 3.4.2.4. Average (2010-2014) Gulf and South Atlantic headboat angler days, by state.

Gulf Angler Days				
West FL/AL	LA	MS	TX	TOTAL
159,236	1,431	1,765	50,638	213,070
South Atlantic Angler Days				
Southeast FL	Northeast FL/GA	SC	NC	TOTAL
94,160	55,619	42,717	20,706	213,203

Source: NMFS Southeast Region Headboat Survey (SRHS).

Economic Value

Economic value can be measured in the form of consumer surplus (CS) per additional king mackerel kept on a trip for anglers (the amount of money that an angler would be willing to pay for a fish in excess of the cost to harvest the fish). The estimated values of the CS per fish for a second, third, fourth, fifth, and sixth king mackerel kept on a trip are approximately $100, $67, $49, $39, and $32, respectively (Carter and Liese 2012; values updated to 2014 dollars).

With regards to for-hire businesses, economic value can be measured by producer surplus (PS) per passenger trip (the amount of money that a vessel owner earns in excess of the cost of providing the trip). Estimates of the PS per for-hire passenger trip are not available. Instead, net operating revenue (NOR), which is the return used to pay all labor wages, returns to capital, and owner profits, is used as a proxy for PS. The estimated NOR value is $153.45 (2014 dollars) per charter angler trip (Liese and Carter 2011). The estimated NOR value per headboat angler trip is $52.97 (2014 dollars) (C. Liese, NMFS SEFSC, pers. Comm.). Estimates of NOR per king mackerel target trip are not available.

Recreational Sector Business Activity

Estimates of the business activity (economic impacts) associated with recreational angling for king mackerel were derived using average impact coefficients for recreational angling for all species, as derived from an add-on survey to the MRFSS to collect economic expenditure information, as described and utilized in NMFS (2011). Estimates of these coefficients for target or catch behavior for individual species are not available. Estimates of the average expenditures by recreational anglers are also provided in NMFS (2011) and are incorporated herein by reference.

Business activity for the recreational sector is characterized in the form of FTE jobs, output (sales) impacts (gross business sales), and value-added impacts (difference between the value of goods and the cost of materials or supplies). Job and output (sales) impacts are equivalent metrics across both the commercial and recreational sectors. Income impacts (commercial sector) and value-added impacts (recreational sector) are not equivalent, though similarity in the magnitude of multipliers generated and used for the two metrics may result in roughly equivalent values. Similar to income impacts, value-added impacts should not be added to output (sales) impacts because this would result in double counting.

Estimates of the average king mackerel effort (2010-2014) and associated business activity (2014 dollars) are provided in Table 3.4.2.5 for Gulf states and Table 3.4.2.6 for South Atlantic states. King mackerel target effort (trips) was selected as the measure of king mackerel effort. More individual angler trips catch king mackerel than target king mackerel, however, as shown in Tables 3.4.2.2 and 3.4.2.3. Estimates of the business activity associated with king mackerel catch trips can be calculated using the ratio of catch trips to target trips because the available estimates of the average impacts per trip are not differentiated by trip intent or catch success. For example, if the estimated number of catch trips is three times the number of target trips for a particular state and mode, the estimate of the business activity associated with these catch trips would equal three times the estimated impacts of target trips.

The estimates of the business activity associated with king mackerel recreational trips are only available at the state level. Addition of the state-level estimates to produce a regional or national total will underestimate the actual amount of total business activity because summing the state estimates will not capture business activity that leaks outside the individual states. A state estimate only reflects activities that occur within that state and not related activity that occurs in another state. For example, if a good is produced in Alabama but sold in Florida, the measure of business activity in Florida associated with the its sale in Florida does not include the production process in Alabama. Assessment of business activity at the national (or regional) level would capture activity in both states and include all activity except that which leaks into other nations.

It is noted that these estimates do not, and should not be expected to, represent the total business activity associated with a specific recreational harvest sector in a given state or in total. For example, these results do not state, or should be interpreted to imply, that there are only 28 jobs associated with the charter sector in Alabama. Instead, as previously stated, these results relate only to the business activity associated with target trips for king mackerel. Few, if any businesses or jobs, would be expected to be devoted solely to king mackerel fishing. The existence of these businesses and jobs, in total, is supported by the fishing for, and expenditures on, the variety of marine species available to anglers throughout the year.

Table 3.4.2.5. Summary of king mackerel target trips (2010-2014 average) and associated business activity (2014 dollars), Gulf states. Output and value added impacts are not additive.

	Alabama	West Florida	Louisiana	Mississippi	Texas
	Shore Mode				
Target Trips	107,003	153,426	0	0	*
Output (Sales) Impact	$7,764,034	$7,473,083	$0	$0	*
Value Added Impact	$4,314,401	$4,164,943	$0	$0	*
Jobs	89	68	0	0	*
	Private/Rental Mode				
Target Trips	35,422	143,945	177	681	*
Output (Sales) Impact	$1,945,363	$7,910,294	$13,595	$24,357	*
Value Added Impact	$1,052,767	$4,479,241	$6,533	$12,389	*
Jobs	21	67	0	0	*
	Charter Mode				
Target Trips	4,421	25,894	0	327	*
Output (Sales) Impact	$2,871,059	$19,296,818	$0	$134,585	*
Value Added Impact	$1,964,800	$12,900,959	$0	$94,806	*
Jobs	28	167	0	1	*
	All Modes				
Target Trips	146,846	323,265	177	1,008	*
Output (Sales) Impact	$12,580,455	$34,680,195	$13,595	$158,942	*
Value Added Impact	$7,331,968	$21,545,143	$6,533	$107,194	*
Jobs	137	303	0	2	*

*Because target information is unavailable, associated business activity cannot be calculated.
Source: Effort data from the MRIP, economic impact results calculated by NMFS SERO using the model developed for NMFS (2011).

Table 3.4.2.6. Summary of king mackerel target trips (2010-2014 average) and associated business activity (2014 dollars), South Atlantic states. Output and value added impacts are not additive.

	East Florida	Georgia	North Carolina	South Carolina
	Shore Mode			
Target Trips	27,420	0	43,273	41,865
Output Impact	$1,191,686	$0	$5,585,725	$4,728,704
Value Added Impact	$660,273	$0	$3,131,264	$2,690,009
Jobs	11	0	55	48
	Private/Rental Mode			
Target Trips	175,860	6,433	60,785	13,538
Output Impact	$9,145,146	$332,056	$5,131,014	$651,349
Value Added Impact	$5,148,548	$194,800	$2,908,700	$362,968
Jobs	78	3	45	7
	Charter Mode			
Target Trips	5,545	34	510	917
Output Impact	$4,421,954	$16,100	$271,760	$607,308
Value Added Impact	$2,910,372	$11,306	$186,133	$417,608
Jobs	37	0	3	7
	All Modes			
Target Trips	208,825	6,467	104,568	56,320
Output Impact	$14,758,786	$348,157	$10,988,499	$5,987,362
Value Added Impact	$8,719,193	$206,106	$6,226,097	$3,470,585
Jobs	126	3	103	62

Source: Effort data from the MRIP, economic impact results calculated by NMFS SERO using the model developed for NMFS (2011).

Table 3.4.2.7. Summary of king mackerel target trips (2010-2014 average) and associated business activity (2014 thousand dollars), Mid-Atlantic states combined. Output and value added impacts are not additive.	Mid-Atlantic States Combined*
	Shore Mode
Target Trips	2,339
Output Impact	$106
Value Added Impact	$67
Jobs	1
	Private/Rental Mode
Target Trips	1,351
Output Impact	$83
Value Added Impact	$52
Jobs	1

	Charter Mode
Target Trips	13
Output Impact	$3
Value Added Impact	$2
Jobs	0
	All Modes
Target Trips	3,703
Output Impact	$191
Value Added Impact	$120
Jobs	2

*Uses Virginia multipliers.
Source: Effort data from the MRIP, economic impact results calculated by NMFS SERO using the model developed for NMFS (2011).

Estimates of the business activity (impacts) associated with headboat king mackerel effort are not available. The headboat sector in the Southeast is not covered in the MRFSS/MRIP, so estimation of the appropriate impact coefficients for the headboat sector has not been conducted. While appropriate impact coefficients are available for the charter sector, potential differences in certain factors, such as the for-hire fee, rates of tourist versus local participation, and expenditure patterns, may result in significant differences in the business impacts of the headboat sector relative to the charter sector.

3.5 Description of the Social Environment

Commercial and recreational king mackerel landings and permits are included by state to provide information on the geographic distribution of fishing involvement. Descriptions of fishing communities including the top communities involved in king mackerel fishing in the Gulf, South Atlantic, and Mid-Atlantic are included here. These community level data are presented in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). National Standard 8 requires the consideration of the importance of fishery resources to human communities when considering changes to fishing regulations. Background information on allocation is provided for context. And lastly, social vulnerability data are presented to assess the potential for environmental justice concerns.

3.5.1 Landings and Permits by State

Commercial Landings

King mackerel is harvested commercially throughout the Gulf, South Atlantic, and Mid-Atlantic. The majority of Gulf migratory group king mackerel is landed in Florida (approximately 70% of Gulf migratory group king mackerel commercial landings, Table 3.5.1.1). A sizable portion of Gulf migratory king mackerel is also landed in Louisiana. Gulf migratory king mackerel is also landed in the other Gulf states, but these states represent a smaller percentage of the total commercial landings.

Table 3.5.1.1. Percentage of total commercial Gulf migratory group king mackerel landings by state for 2013.

State	Landings
AL	5.64%
FL (East Coast)[1]	27.36%
FL (West Coast)[2]	42.46%
LA	23.50%
MS	1.00%
TX	0.05%

Source: SERO ACL Files (July 2014)

[1] Gulf king mackerel landings on the Atlantic side of the council jurisdiction boundary in the Florida Keys (north/east of US-1).

[2] Gulf king mackerel landings on the Gulf side of the council jurisdiction boundary in the Florida Keys.

The majority of Atlantic migratory group king mackerel is also landed in Florida (approximately 68% of Atlantic migratory group king mackerel commercial landings, Table 3.5.1.2). Nearly one-third of commercial landings of Atlantic migratory king mackerel are landed in North Carolina. Atlantic migratory group king mackerel is also landed in the other states in the South and Mid-Atlantic, but these states represent a smaller percentage of the total commercial landings (Delaware, Georgia, Maryland, New Jersey, New York, South Carolina, and Virginia make-up less than 0.6% of Atlantic migratory king mackerel commercial landings, Table 3.5.1.2).

Table 3.5.1.2. Percentage of total commercial Atlantic migratory group king mackerel landings by state for 2013.

State	Landings
DE	confidential
FL (East Coast)[1]	62.15%
FL (West Coast)[2]	6.33%
GA	confidential
MD	confidential
NJ	confidential
NY	confidential
NC	30.93%
SC	0.56%
VA	confidential

Source: SERO ACL Files (July 2014)

[1] Gulf king mackerel landings on the Atlantic side of the council jurisdiction boundary in the Florida Keys (north/east of US-1).

[2] Gulf king mackerel landings on the Gulf side of the council jurisdiction boundary in the Florida Keys.

Commercial Permits

Commercial king mackerel permits are issued to individuals residing in the Gulf, South Atlantic, Mid-Atlantic, New England, and in other states (Table 3.5.1.3).

Table 3.5.1.3. Number of commercial king mackerel permits and gillnet for king mackerel permits by state and region.

State	King Mackerel Permits	Gillnet for King Mackerel Permits
NC	210	1
SC	27	0
GA	11	0
FL (East Coast)	549	3
FL (Keys)	145	12
South Atlantic Total (including FL Keys)	942	16
FL (West Coast, no FL Keys)	242	4
AL	36	0
MS	10	0
LA	42	0
TX	38	0
Gulf Total (no FL Keys)	368	4
Mid-Atlantic	28	0
New England	2	0
Other States	3	0
Total	**1343**	**20**

Source: SERO permit office, November 20, 2015.

The total number of permits reported in Table 3.5.1.3 may vary from numbers reported elsewhere, such as Section 3.4.1 because of the date these data were assembled. The largest number of commercial king mackerel permits are issued to individuals residing in South Atlantic states (over 70% of commercial king mackerel permits, Table 3.5.1.3) and individuals residing in Florida (approximately 70% of king mackerel permits). Individuals in Gulf States hold approximately 28% of king mackerel permits. Individuals in North Carolina also hold a sizable percentage of king mackerel permits (about 16%). Residents of other states in the South Atlantic, Gulf, Mid-Atlantic, New England, and in a few other states also hold commercial king mackerel permits, but these states represent a smaller percentage of the total number of issued permits. Gillnet for king mackerel permits, which is an endorsement to a Gulf king mackerel permit, are issued to individuals residing in Florida (95% of gillnet for king mackerel permits, Table 3.5.1.3) and North Carolina.

Recreational Landings

The majority of the recreational Gulf group king mackerel catch is landed along the west coast of Florida (approximately 72%, Table 3.5.1.4). Alabama, Texas, and the east coast of Florida also include sizable amounts of the recreational Gulf group king mackerel catch. Other Gulf States are also involved in recreational Gulf group king mackerel fishing, but these states represent a much smaller percentage of the total recreational landings.

Table 3.5.1.4. Percentage of total recreational Gulf group king mackerel landings by state for 2014.

State	Landings
AL	12.63%
FL (East Coast)[1]	7.62%
FL (West Coast)[2]	71.71%
LA/MS	0.82%
TX	7.22%

Source: SERO (July 2015)

[1] Gulf king mackerel landings on the Atlantic side of the council jurisdiction boundary in the Florida Keys (north/east of US-1).

[2] Gulf king mackerel landings on the Gulf side of the council jurisdiction boundary in the Florida Keys.

Most of the recreational Atlantic group king mackerel catch is landed along the east coast of Florida and in North Carolina (Table 3.5.1.5). Other South Atlantic states are involved in recreational Atlantic group king mackerel fishing, but represent a smaller percentage of the total recreational landings. Georgia represents a very small percentage of the total recreational landings, but is combined with the east coast of Florida in order to maintain confidentiality.

Table 3.5.1.5. Percentage of total recreational Atlantic group king mackerel landings by state for 2014.

State	Landings
FL (East Coast)[1]/GA	61.53%
FL (West Coast)[2]	2.66%

NC	31.66%
SC	4.15%

Source: SERO (July 2015)
[1] Atlantic king mackerel landings on the Atlantic side of the council jurisdiction boundary in the Florida Keys (north/east of US-1).
[2] Atlantic king mackerel landings on the Gulf side of the council jurisdiction boundary in the Florida Keys.

Recreational Permits

Charter/headboat for pelagic fish permits, which include king mackerel, are issued to individuals residing in the Gulf, South Atlantic, Mid-Atlantic, New England, and in other states. The largest number of charter/headboat for pelagic fish permits is issued to individuals in Florida (approximately 57% of Atlantic, 56% of Gulf, and 48% of historical captain Gulf charter/headboat permits for pelagic fish, Table 3.5.1.6). Other states with a sizable amount of Atlantic charter/headboat for pelagic fish permits include North Carolina (approximately 18% of South Atlantic permits) and South Carolina (approximately 10%). Other states with a sizable amount of Gulf charter/headboat for pelagic fish permits include Texas (approximately 18% of Gulf permits), Alabama (approximately 10%), and Louisiana (approximately 8%). And other states with a sizable amount of historical captain Gulf charter/headboat for pelagic fish permits include Louisiana and Texas (each with approximately 17% of historical captain Gulf charter/headboat for pelagic fish permits) and Alabama (approximately 10%). Residents of other states in the South Atlantic, Gulf, Mid-Atlantic, New England, and in a few other states also hold charter/headboat for pelagic fish permits, but these states represent a smaller percentage of the total number of issued permits.

Table 3.5.1.6. Number of pelagic fish charter/headboat permits by state and region.

State	Atlantic Charter/Headboat for CMP Permits	Gulf Charter/Headboat for CMP Permits	Historical Captain Gulf Charter/Headboat for CMP Permits
NC	268	14	0
SC	149	1	0
GA	37	16	0
FL (East Coast)	332	18	0
FL (Keys)	275	75	0
South Atlantic Total (including FL Keys)	1061	124	0
FL (West Coast)	220	593	14
AL	27	117	3
MS	2	34	2
LA	7	103	5
TX	28	225	5

Gulf Total (no FL Keys)	284	1072	29
Mid-Atlantic	99	7	0
New England	10	5	0
Other States	8	12	0
Total	**1462**	**1220**	**29**

Source: SERO permit office, November 20, 2015.

3.5.2 Fishing Communities

Demographic profiles of coastal communities can be found in Amendment 18 (GMFMC and SAFMC 2011) and Amendment 20B (GMFMC and SAFMC 2014). The referenced description focuses on available geographic and demographic data to identify communities having a strong relationship with king mackerel fishing using 2008 and 2011 Accumulated Landings System (ALS) data. A strong relationship is defined as having significant landings and revenue for these species. Thus, positive or negative impacts from regulatory change are expected to occur in places with greater landings. This section has been updated using 2012 ALS data, the most recent year available.

The descriptions of Gulf, South Atlantic, and Mid-Atlantic communities include information about the top communities based upon a "regional quotient" of commercial landings and value for king mackerel. The regional quotient is the proportion of landings and value out of the total landings and value of that species for that region, and is a relative measure. The Florida Keys communities are included in both Gulf and South Atlantic communities to allow for comparison within each region. Although almost all communities in the South Atlantic, Mid-Atlantic, and Gulf regions have commercial landings of multiple species in addition to king mackerel, these top communities are referred to in this document as king mackerel communities. These communities would be most likely to experience the effects of the proposed actions that could change the king mackerel fishery and impact the participants and associated businesses and communities within the region. If a community is identified as a king mackerel community based on the regional quotient, this does not necessarily mean that the community would experience significant impacts due to changes in the king mackerel fishery if a different species or number of species were also important to the local community and economy. More detailed information about communities with the highest regional quotients are found in Amendment 18 (GMFMC and SAFMC 2011) and Amendment 20B (GMFMC and SAFMC 2014).

In addition to examining the regional quotients to understand how South Atlantic, Gulf, and Mid-Atlantic communities are engaged and reliant on fishing, indices were created using secondary data from permit and landings information for the commercial sector and permit information for the recreational sector (Jepson and Colburn 2013, Jacob et al. 2013). Fishing engagement is primarily the absolute numbers of permits, landings, and value. For commercial fishing, the analysis used the number of vessels designated commercial by homeport and owner address, value of landings, and total number of commercial permits for each community. Recreational fishing engagement is represented by the number of recreational permits and vessels designated as recreational by homeport and owners address. Fishing reliance includes the same variables as fishing engagement divided by population to give an indication of the per capita influence of this activity.

Using a principal component and single solution factor analysis each community receives a factor score for each index to compare to other communities. Taking the communities with the highest regional quotients, factor scores of both engagement and reliance for both commercial and recreational fishing were plotted. Two thresholds of one and ½ standard deviation above the mean are plotted onto the graphs to help determine a threshold for significance. The factor scores are standardized therefore a score above 1 is also above one standard deviation. A score above ½ standard deviation is considered engaged or reliant with anything above 1 standard deviation to be very engaged or reliant.

The reliance index uses factor scores that are normalized. The factor score is similar to a z-score in that the mean is always zero and positive scores are above the mean and negative scores are below the mean. Comparisons between scores are relative but one should bear in mind that like a z-score, the factor score puts the community on a spot in the distribution. Objectively they have a score related to the percent of communities with those similar attributes. For example, a score of 2.0 means the community is two standard deviations above the mean and is among the 2.27% most vulnerable places in the study (normal distribution curve). Reliance score comparisons between communities are relative. However, if the community scores greater than two standard deviations above the mean, this indicates that the community is dependent on fishing. Examining the component variables on the reliance index and how they are weighted by factor score provides a measurement of commercial reliance. The reliance index provides a way to gauge change over time in these communities and also provides a comparison of one community with another.

Gulf King Mackerel Fishing Communities

Commercial Communities

About 46% of all Gulf king mackerel is landed in Destin, Florida, representing about 53% of the Gulf-wide value (Figure 3.5.2.1). Two Florida Keys communities (Key West and Marathon) are included in the top communities and collectively these communities represent a substantial portion of the landings and value of commercial king mackerel. Naples, Florida, also represents a substantial portion of landings. In addition, the top 15 communities include two other Florida communities, five Louisiana communities, and three communities in Alabama.

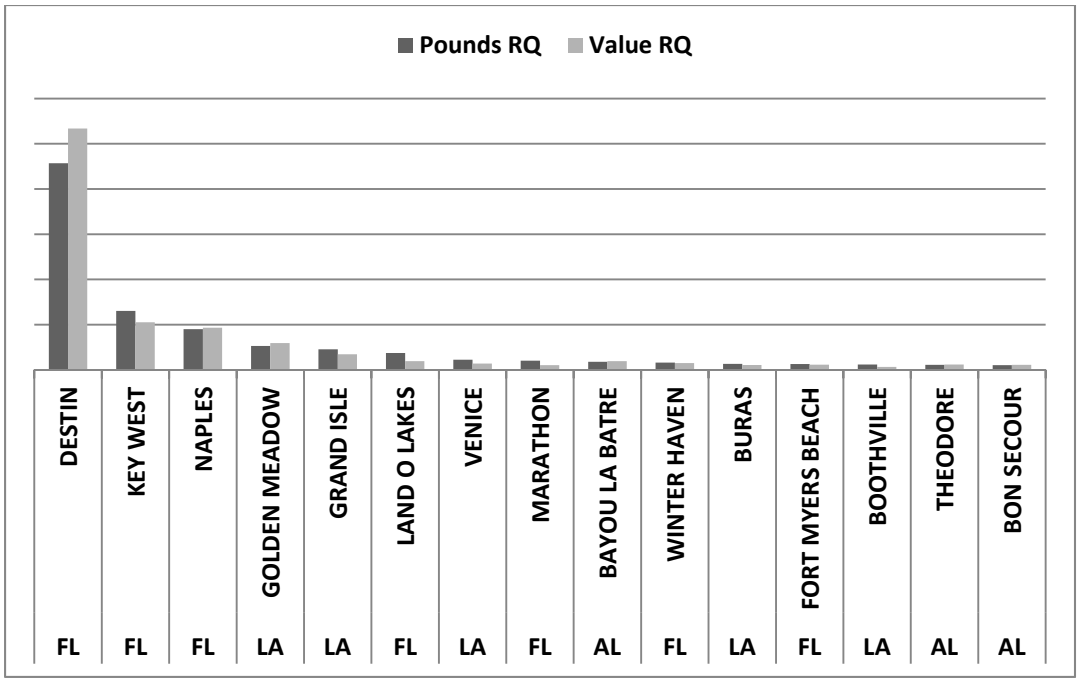

Figure 3.5.2.1. Top fifteen Gulf communities ranked by pounds and value regional quotient (RQ) of king mackerel. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2012.

Reliance on and Engagement with Commercial and Recreational Fishing
The details of how these indices are generated are explained in the beginning of Section 3.5.2. For king mackerel (Figure 3.5.2.2), the primary communities that demonstrate high levels of commercial fishing engagement and reliance include Bayou La Batre, Alabama; Key West, Destin and Marathon, Florida; and Grand Isle, and Boothville-Venice, Louisiana. Communities with substantial recreational engagement and reliance include Destin, Key West, and Marathon, Florida and Grand Isle, Louisiana.

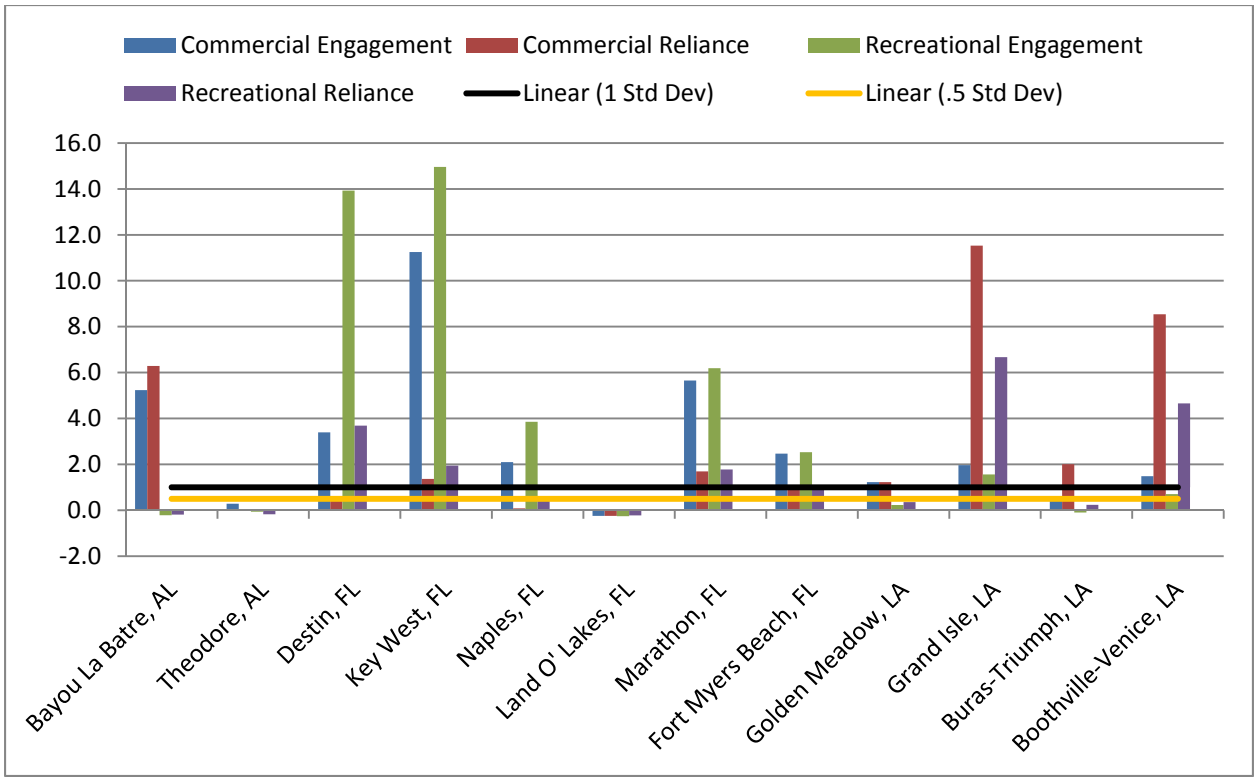

Figure 3.5.2.2. Commercial and recreational reliance and engagement for Gulf communities with the top regional quotients for king mackerel.
Source: SERO Social Indicator Database 2012.

South Atlantic King Mackerel Fishing Communities

Commercial Communities
Cocoa, Florida, lands about 29% of all king mackerel among South Atlantic fishing communities and those landings represent approximately 30% of the value (Figure 3.5.2.3). Only four North Carolina communities rank in the top fifteen, and no South Carolina or Georgia communities are included in the top 15 communities.

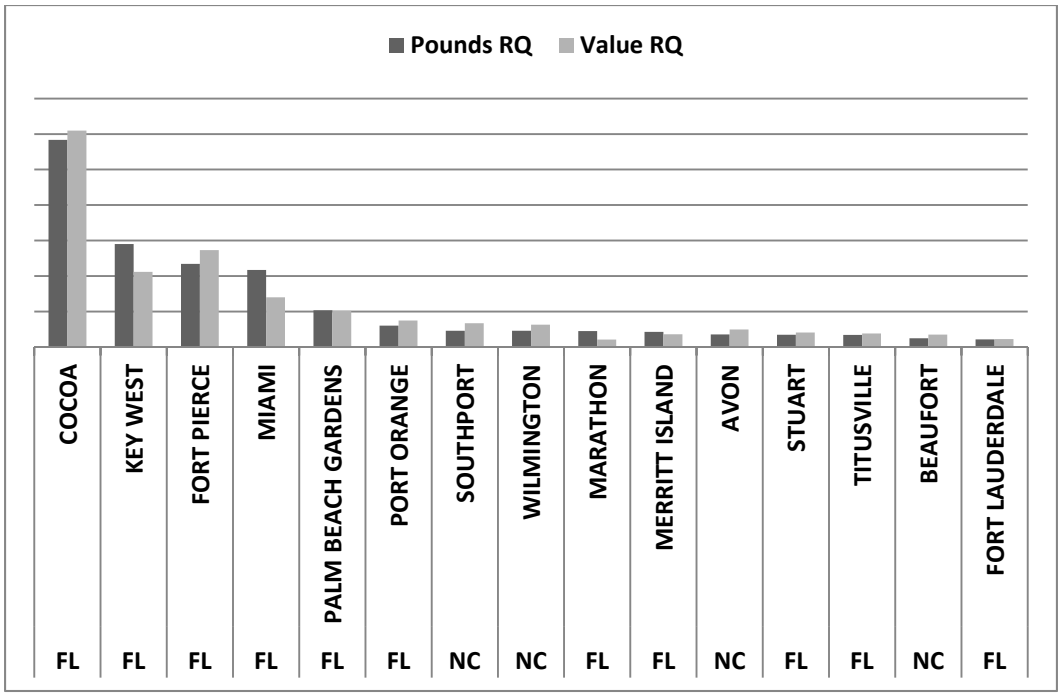

Figure 3.5.2.3. Top fifteen South Atlantic communities ranked by pounds and value regional quotient (RQ) of king mackerel. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2012.

Reliance on and Engagement with Commercial and Recreational Fishing
For king mackerel (Figure 3.5.2.4), the primary communities that demonstrate high levels of commercial fishing engagement and reliance are Key West and Marathon, Florida; and Southport and Beaufort, North Carolina. Communities with substantial recreational engagement and reliance include Key West and Marathon, Florida.

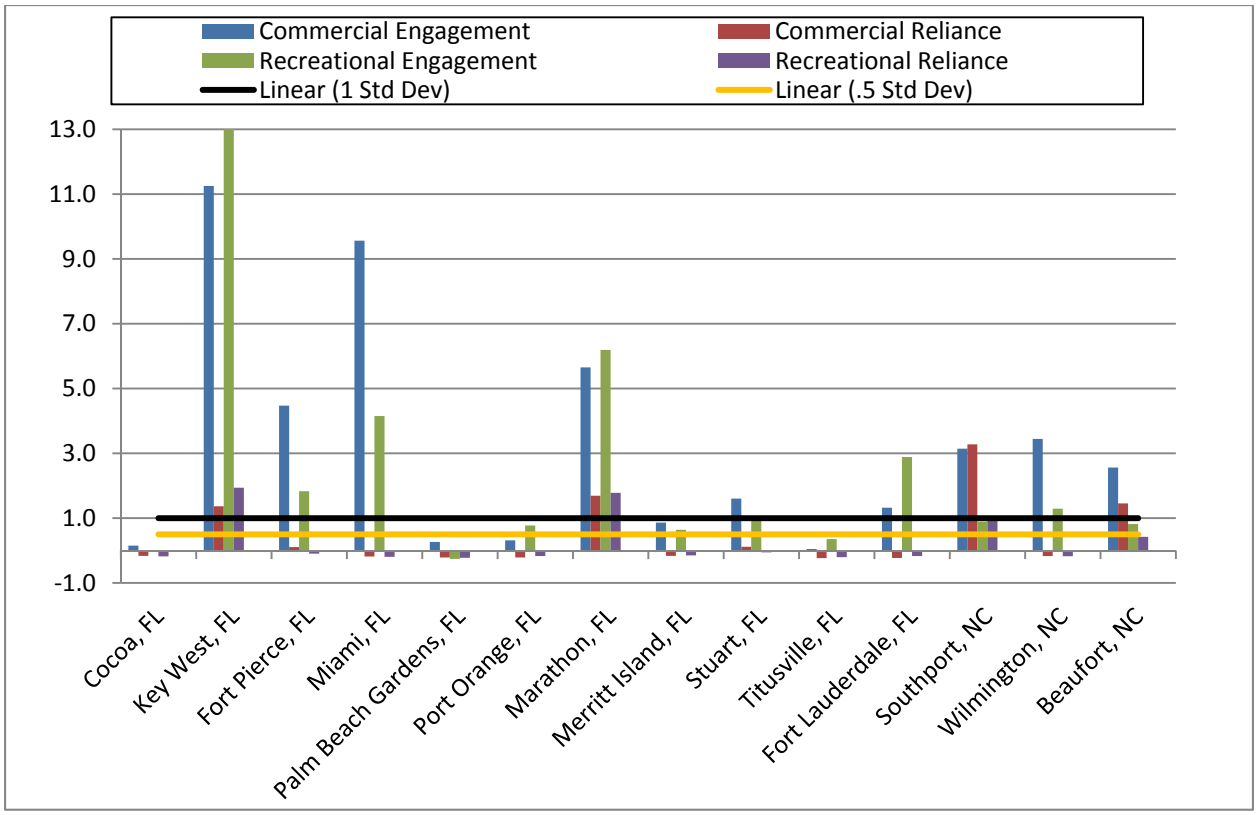

Figure 3.5.2.4. Commercial and recreational reliance and engagement for South Atlantic communities with the top regional quotients for king mackerel.
Source: SERO Social Indicator Database 2012.

Mid-Atlantic King Mackerel Fishing Communities

The South Atlantic Council manages Atlantic migratory groups of king mackerel through the Mid-Atlantic region as well as in the South Atlantic region. Overall, landings of these species in the Mid-Atlantic region are very low, and management actions by the South Atlantic Council likely have minimal impacts on Mid-Atlantic communities.

Commercial Communities
For king mackerel in the Mid-Atlantic (Figure 3.5.2.5), the most landings at the regional level occur in Montauk, New York. Other Mid-Atlantic communities with commercial king mackerel landings include Newport News, Virginia; Accomac, Virginia; Ocean City, Maryland; and Newport, Rhode Island.

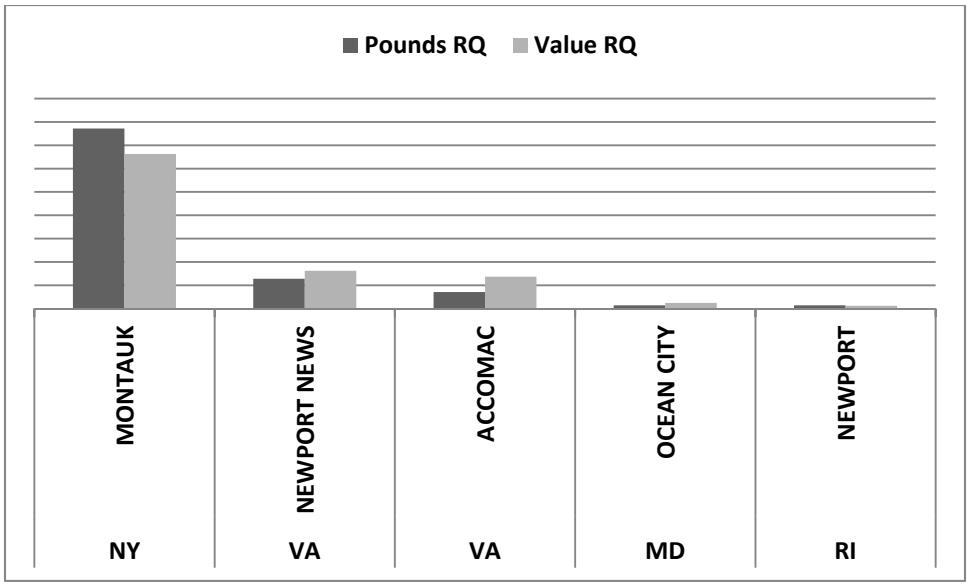

Figure 3.5.2.5. Top Mid-Atlantic communities ranked by pounds and value regional quotient (RQ) of king mackerel. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: NEFSC 2012.

Reliance on and Engagement with Commercial and Recreational Fishing
For king mackerel (Figure 3.5.2.6), the Mid-Atlantic community that demonstrates relatively high levels of commercial fishing engagement and reliance is Montauk, New York. Communities with substantial recreational engagement and reliance include Montauk, New York; Newport News, Virginia; Newport, Rhode Island; and Ocean City, Maryland.

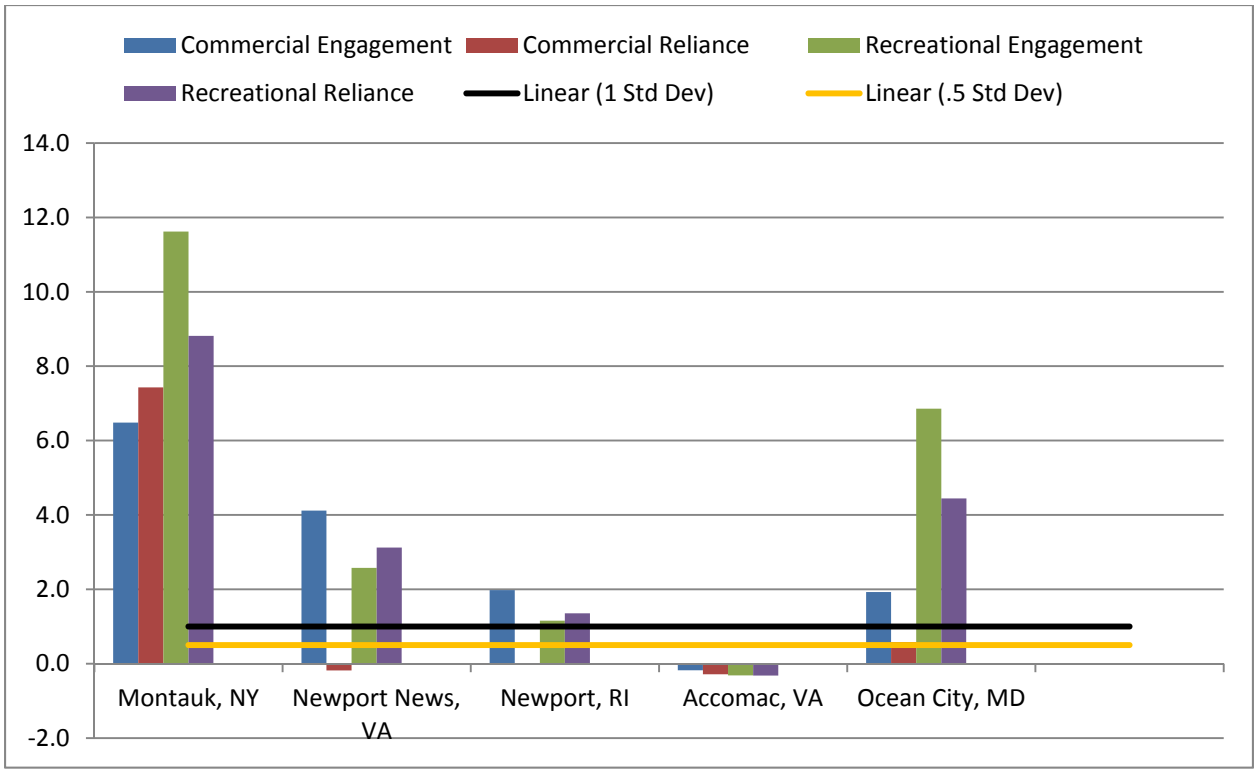

Figure 3.5.2.6. Commercial and recreational reliance and engagement for Mid-Atlantic communities with the top regional quotients for king mackerel.
Source: SERO/NEFSC Social Indicator Database 2012.

3.5.3 Environmental Justice Considerations

Executive Order 12898 requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. This executive order is generally referred to as environmental justice (EJ).

To evaluate EJ considerations for the proposed actions, analysis was completed utilizing a suite of indices created to examine the social vulnerability of coastal communities and is depicted in Figures 3.5.3.1, 3.5.3.2, and 3.5.3.3. The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups; more single female-headed households; more households with children under the age of 5; and disruptions like higher separation rates, higher crime rates, and unemployment all are signs of populations having vulnerabilities. The data used to create these indices are from the 2005-2009 American Community Survey estimates at the U.S. Census Bureau. The thresholds of 1 and ½ standard deviation are the same for these standardized indices. Again, for those communities that exceed the threshold for all indices it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Similar to the reliance index discussed at the beginning of Section 3.5.2, the vulnerability indices also use normalized factor scores. Comparison of vulnerability scores is relative, but the score is related to the percent of communities with similar attributes. The social vulnerability indices provide a way to gauge change over time with these communities but also provides a comparison of one community with another.

With regard to social vulnerabilities, the following South Atlantic and Gulf communities exceed the threshold of 0.5 standard deviation for at least one of the social vulnerability indices (Figures 3.5.3.1 and 3.5.3.2): Bayou La Batre and Theodore, Alabama; Cocoa, Fort Pierce, Miami, Stuart, and Fort Lauderdale in Florida; Golden Meadow, Grand Isle, and Boothville-Venice in Louisiana; and Wilmington and Beaufort, North Carolina. The communities of Bayou La Batre, Alabama, and the Florida communities of Cocoa, Fort Pierce and Miami exceed the thresholds on all three social vulnerability indices. These communities have vulnerabilities and may be susceptible to effects from regulatory change depending upon the direction and extent of that change.

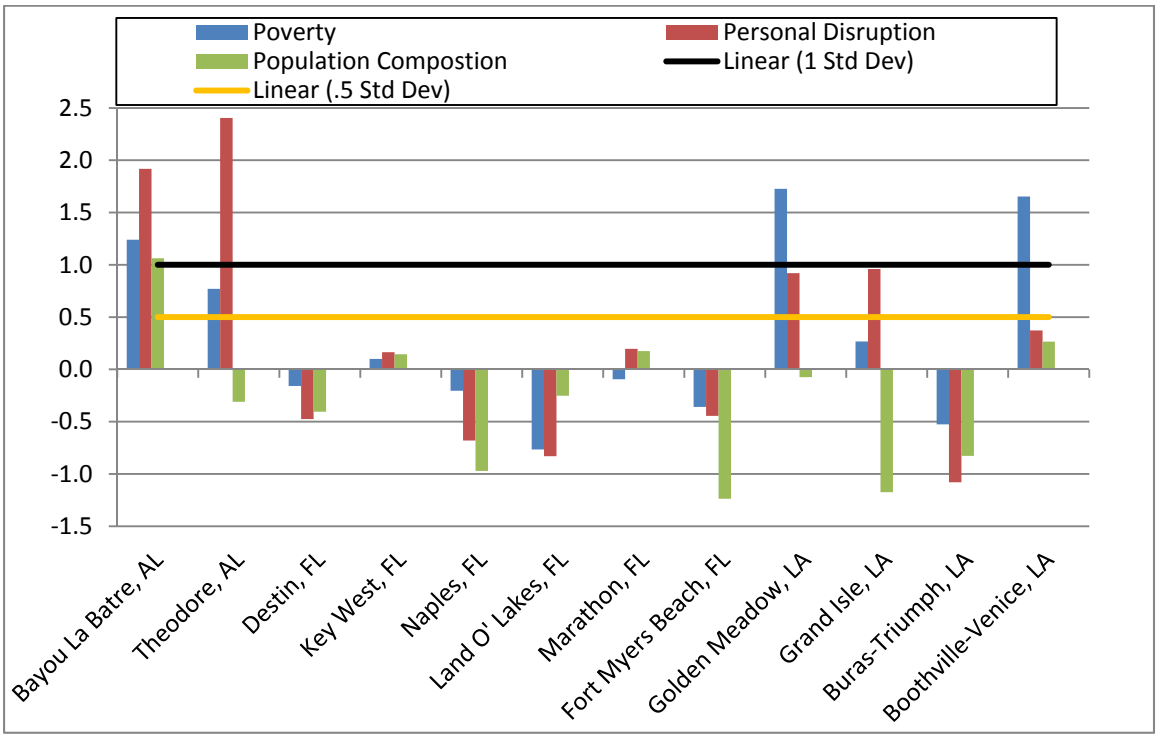

Figure 3.5.3.1. Social vulnerability indices for fifteen Gulf communities with the top regional quotients for king mackerel.
Source: SERO, Social Indicator Database 2012.

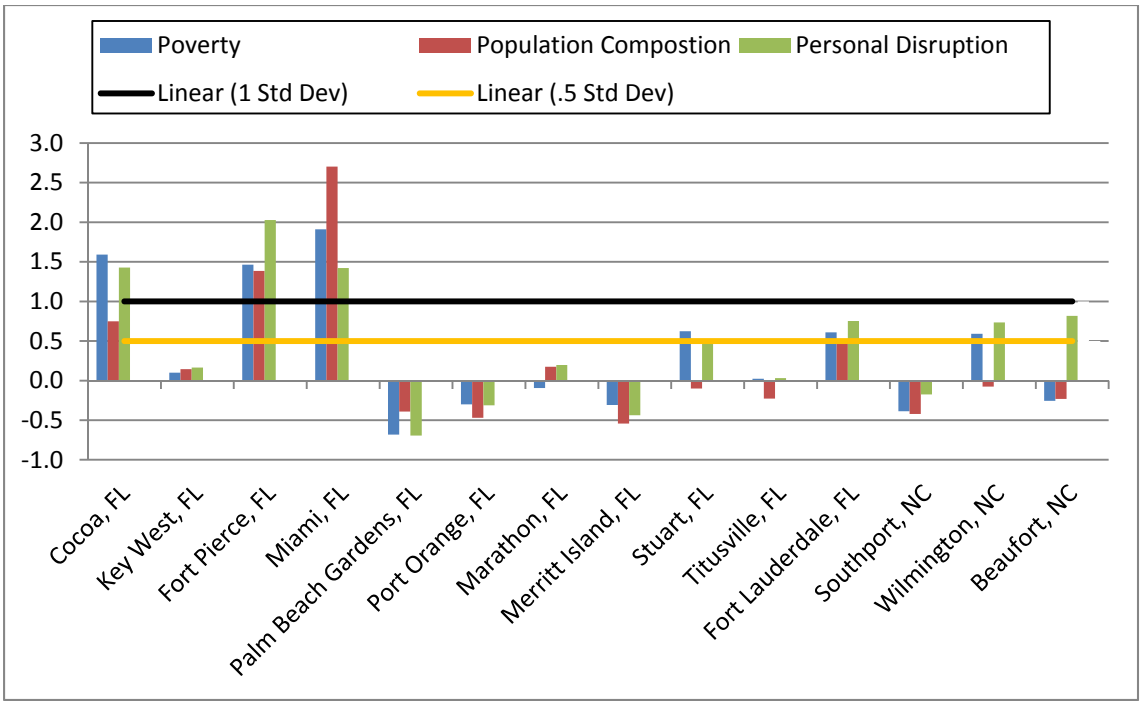

Figure 3.5.3.2. Social vulnerability indices for fifteen South Atlantic communities with the top regional quotients for king mackerel.
Source: SERO, Social Indicator Database 2012.

With regard to social vulnerabilities for the Mid-Atlantic Region, the following communities exceed the threshold of 0.5 standard deviation above the mean for one of the social vulnerability indices (Figure 3.5.3.3): Newport News, Virginia and Ocean City, Maryland. These communities may be vulnerable to regulatory change. No other communities exceed the thresholds of any of the three indices.

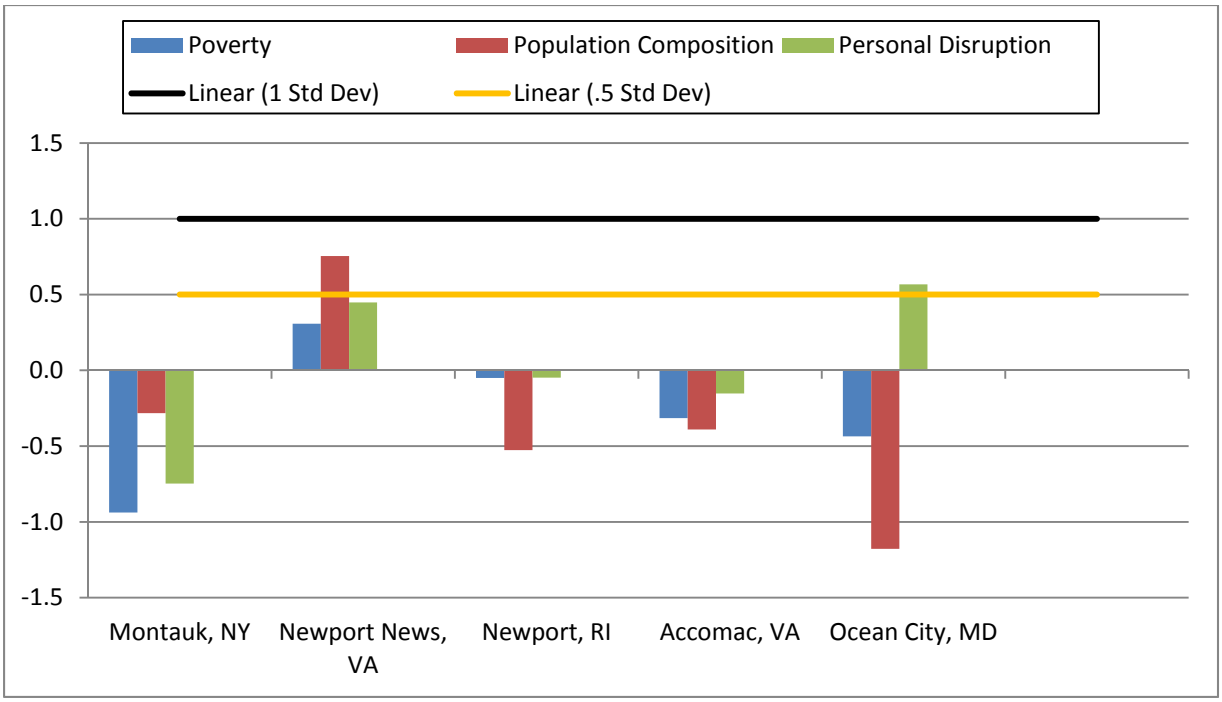

Figure 3.5.3.3. Social vulnerability indices for fifteen Mid-Atlantic communities with the top regional quotients for king mackerel.
Source: SERO, Social Indicator Database 2012.

While some communities expected to be affected by this proposed amendment may have minority or economic profiles that exceed the EJ thresholds and, therefore, may constitute areas of concern, significant EJ issues are not expected to arise as a result of this proposed amendment. No adverse human health or environmental effects are expected to accrue from this proposed amendment, nor are these measures expected to result in an increased risk of exposure of affected individuals to adverse health hazards. The proposed management measures would apply to all participants in the affected area, regardless of minority status or income level, and information is not available to suggest that minorities or lower income persons are, on average, more dependent on the affected species than non-minority or higher income persons.

Finally, the general participatory process used in the development of fishery management measures (e.g., scoping meetings, public hearings, and open South Atlantic and Gulf Council meetings) is expected to provide sufficient opportunity for meaningful involvement by potentially affected individuals to participate in the development process of this amendment and have their concerns factored into the decision process. Public input from individuals who participate in the fishery has been considered and incorporated into management decisions throughout development of the amendment.

3.6 Description of the Administrative Environment

3.6.1 Federal Fishery Management

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

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

The Gulf Council is responsible for fishery resources in federal waters of the Gulf of Mexico. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the Florida and Texas, and the three-mile seaward boundary of the Alabama, Mississippi, and Louisiana; however, a bill signed by the U.S. President in December 2016 extended the seaward boundary of state waters for Alabama, Mississippi, and Louisiana to nine miles until October 2016. The Council consists of 17 voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NOAA Fisheries.

The South Atlantic Council is responsible for conservation and management of fishery resources in federal waters of the U.S. South Atlantic. These waters extend from 3 to 200 miles offshore from the seaward boundary of the states of North Carolina, South Carolina, Georgia, and east Florida to Key West. The Council has thirteen voting members: one from NOAA Fisheries Service; one each from the state fishery agencies of North Carolina, South Carolina, Georgia, and Florida; and eight public members appointed by the Secretary. Non-voting members include representatives of the U.S. Fish and Wildlife Service, USCG, and Atlantic States Marine Fisheries Commission (ASMFC).

The Mid-Atlantic Council has two voting seats on the South Atlantic Council's Mackerel Committee but does not vote during Council sessions. The Mid-Atlantic Council is responsible for fishery resources in federal waters off New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina, but has delegated management of CMP species to the South Atlantic Council.

The Councils use Scientific and Statistical Committees to review the data and science being used in assessments and fishery management plans/amendments. Regulations contained within FMPs are enforced through actions of the NOAA's Office for Law Enforcement, the USCG, and various state authorities.

The public is involved in the fishery management process through participation at public meetings, on advisory panels and through council meetings that, with few exceptions for discussing personnel matters, are open to the public. The regulatory process is in accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

3.6.2 State Fishery Management

The purpose of state representation at the Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments have the authority to manage their respective state fisheries including enforcement of fishing regulations. Each of the eight states exercises legislative and regulatory authority over their states' natural resources through discrete administrative units. Although each agency listed below is the primary administrative body with respect to the states natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources.

The states are also involved through the Gulf of Mexico Marine Fisheries Commission (GSMFC) and the ASMFC in management of marine fisheries. These commissions were created to coordinate state regulations and develop management plans for interstate fisheries.

NOAA Fisheries Service' State-Federal Fisheries Division is responsible for building cooperative partnerships to strengthen marine fisheries management and conservation at the state, inter-regional, and national levels. This division implements and oversees the distribution of grants for two national (Inter-jurisdictional Fisheries Act and Anadromous Fish Conservation Act) and two regional (Atlantic Coastal Fisheries Cooperative Management Act and Atlantic Striped Bass Conservation Act) programs. Additionally, it works with the commissions to develop and implement cooperative State-Federal fisheries regulations.

More information about these agencies can be found from the following web pages:
Texas Parks & Wildlife Department – http://www.tpwd.state.tx.us
Louisiana Department of Wildlife and Fisheries http://www.wlf.state.la.us/
Mississippi Department of Marine Resources http://www.dmr.state.ms.us/
Alabama Department of Conservation and Natural Resources http://www.dcnr.state.al.us/
Florida Fish and Wildlife Conservation Commission http://www.myfwc.com
Georgia Department of Natural Resources, Coastal Resources Division http://crd.dnr.state.ga.us/
South Carolina Department of Natural Resources http://www.dnr.sc.gov/
North Carolina Department of Environmental Quality http://deq.nc.gov/

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action 1 – Adjust the Management Boundary for Gulf of Mexico (Gulf) and Atlantic Migratory Groups of King Mackerel

Alternative 1: No action – Maintain the current shifting management boundary between the Gulf and Atlantic migratory groups of king mackerel.

Alternative 2: Establish a single year-round boundary for separating management of the Gulf and Atlantic migratory groups of king mackerel at the regulatory boundary between the Gulf and South Atlantic Fishery Management Councils (Councils). The South Atlantic Council would be responsible for management measures in the mixing zone.

Preferred Alternative 3: Establish a single year-round boundary for separating the Gulf and Atlantic migratory groups of king mackerel at the Miami-Dade/Monroe county line. The Gulf Council would be responsible for management measures in the mixing zone.

4.1.1 Direct and Indirect Effects on the Physical and Biological Environments

King mackerel are typically caught at the ocean surface and, therefore, neither hook-and-line nor run-around gillnet gear typically come in contact with bottom habitat. However, these gear types have the potential to snag and entangle bottom structures and cause tear-offs or abrasions (Barnette 2001). If gear is lost or improperly disposed of, it can entangle marine life. Entangled gear often becomes fouled with algal growth. If fouled gear becomes entangled on corals, the algae may eventually overgrow and kill the coral. Any increase in effort would increase these impacts to the physical environment.

Management actions that affect the biological environment mostly relate to the impacts of fishing on a species' population size, life history, and the role of the species within its habitat. Removal of fish from the population through fishing can reduce the overall population size if harvest is not maintained at sustainable levels. The same would be true of non-targeted species incidentally caught during king mackerel fishing. Impacts of these alternatives on the biological environment would depend on the resulting reduction or increase in the level of fishing as a result of each alternative.

Changes to the management boundary would not be expected to result in any major differences in the effects on the physical or biological environment compared to **Alternative 1**. The same methods of fishing with the same gear would be expected to occur with **Alternative 2** and **Preferred Alternative 3** as with **Alternative 1**. The only potential change would be that on the east coast of Florida during winter, the current 50-fish trip limit could be eliminated. Having no trip limit for part of the year could allow a more rapid harvest of king mackerel and a greater probability of exceeding the annual catch limit (ACL). However, Action 5 in this amendment could establish a separate Atlantic migratory group subzone for the east coast of Florida with new trip limits. In that case, any change to the effects on the biological and physical

environments would be dependent on the size of the trip limit for the new subzone. The amount of bycatch should not differ among the alternatives because the same level of fishing would be expected with **Alternative 2** and **Preferred Alternative 3** as with **Alternative 1**.

4.1.2 Direct and Indirect Effects on the Economic Environment

Alternative 1 would maintain the seasonal boundaries between the Gulf and South Atlantic migratory groups for king mackerel and continue summer and winter boundaries between the migratory groups. **Alternative 1** would not be expected to affect the methods of fishing for, harvest, and customary uses of king mackerel. Therefore, **Alternative 1** would not be expected to result in economic effects.

Alternative 2 and **Preferred Alternative 3** would establish year-round boundaries between the Gulf of Mexico (Gulf) and South Atlantic migratory groups of king mackerel. The establishment of boundaries that remain unchanged during the year would be expected to be beneficial to fishermen because year-round boundaries would reduce confusion and possibly streamline enforcement. **Alternative 2** and **Preferred Alternative 3** are thus expected to result in positive economic effects. However, **Alternative 2** and **Preferred Alternative 3** would eliminate the 50-fish trip limit currently in effect on the east coast of Florida during winter. The elimination of the trip limit could result in increased harvest rates and potentially increase the likelihood of overages. However, Action 5 in this amendment could establish trip limits for the Atlantic Southern Zone that would apply to the Florida east coast. In that case, expected economic effects may be dependent on the size of the trip limit for the Atlantic Southern Zone.

Alternative 2 and **Preferred Alternative 3** would be expected to result in adverse economic effects if overages occur as a result of boundary adjustments. Although unknown at this time, the magnitude of these potential adverse economic effects would be expected to be determined by the increased probability of recording overages, the size of the overages and by the severity of corrective measures that would be implemented as a result. Compared to **Preferred Alternative 3**, **Alternative 2** would be expected to result in additional adverse economic effects for fishermen in the Florida Keys, since **Alternative 2** would split management of the king mackerel gillnet component between the Gulf and South Atlantic Fishery Management Councils (Councils). The additional complications due to split management would be expected to be detrimental to gillnet fishermen because this gear is not allowed to be used for harvesting king mackerel in the South Atlantic Council's jurisdiction.

4.1.3 Direct and Indirect Effects on the Social Environment

The recent stock assessment determined that the stock mixing zone is smaller than the area currently defined as the mixing zone. Although additional effects would not usually be expected from retaining the current management boundary between the Gulf and Atlantic migratory groups under **Alternative 1** (No Action), this boundary would be inconsistent with the stock assessment.

Modifying the management boundary would not be expected to result in direct social effects, as moving the boundary would not affect fishing activity or behavior. Some indirect social benefits

would be expected under **Alternative 2** and **Preferred Alternative 3**, as the management boundary would become consistent with the stock assessment, which in turn, allows for the increase in the total allowable harvest to be distributed according to other actions in this amendment. Further, under **Alternative 2** and **Preferred Alternative 3**, the management boundary would no longer shift during the year, but remain fixed year-round.

Any indirect effects from **Alternative 2** and **Preferred Alternative 3** would be similar for all commercial fishermen except the small gillnet fleet in southwestern Florida and the Florida Keys. Under **Alternative 2**, management of the gillnet fleet would be split between the Councils' jurisdictions. This would pose problems for the gillnet fishermen, as some vessels would be managed by each Council. Further, gillnets are currently prohibited in the South Atlantic region. In contrast, under **Preferred Alternative 3**, the gillnet fleet would be managed exclusively by the Gulf of Mexico Fishery Management Council (Gulf Council), which allows gillnets to be used for the commercial harvest of king mackerel. Thus, some additional indirect benefits would be expected from **Preferred Alternative 3**, compared to **Alternative 2**.

4.1.4 Direct and Indirect Effects on the Administrative Environment

The most impactful change with **Alternative 2** or **Preferred Alternative 3** versus **Alternative 1** would be the removal of the Gulf Florida East Coast Subzone. This would ease the administrative burden because National Marine Fisheries Service (NMFS) would have less area with a quota to monitor and accountability measures (AMs) to implement. Regardless of the management measures established, NMFS would still monitor landings relative to the quota, and implement closures and other AMs.

The burden on enforcement would be higher with **Alternative 2** than with **Preferred Alternative 3** because the boundary between management areas would be in the middle of the Florida Keys. The burden on enforcement would be even higher with **Alternative 1** because the boundary would move during the year. Enforcement under **Preferred Alternative 3** would also be easier because the boundary for king mackerel would be the same as for Spanish mackerel and cobia.

4.2 Action 2 – Update Reference Points and Revise the Annual Catch Limit (ACL) and Recreational Annual Catch Target (ACT) for Atlantic Migratory Group King Mackerel

4.2.1 Action 2-1 – Revise the Acceptable Biological Catch (ABC) for Atlantic Migratory Group King Mackerel

Alternative 1: No action – Retain the current ABC for Atlantic Migratory Group King Mackerel (10.46 million pounds).

Preferred Alternative 2: Revise the ABC for Atlantic Migratory Group King Mackerel for 2016/17 through 2019/20 based on the ABC levels recommended by the South Atlantic Scientific and Statistical Committee (SSC) for ABC under a high recruitment scenario.

Alternative 3: Revise the ABC for Atlantic Migratory Group King Mackerel for 2016/17 through 2019/20 based on the ABC levels recommended by the South Atlantic SSC for ABC under a medium recruitment scenario.

Alternative 4: Revise the ABC for Atlantic Migratory Group King Mackerel for 2016/17 through 2019/20 based on the ABC levels recommended by the South Atlantic SSC for ABC under a low recruitment scenario.

4.2.1.1 Direct and Indirect Effects on the Physical and Biological Environments

Alternative 1 (No Action) would not update the ABC values for Atlantic king mackerel based on the outcomes of the recent stock assessment. **Alternatives 2 (Preferred) – 4** allow the Councils to consider information about recruitment when setting the ABC for Atlantic king mackerel, with the option to set the ABC values based on a high (**Preferred Alternative 2**), medium (**Alternative 3**), or low (**Alternative 4**) recruitment scenario.

Table 4.2.1 illustrates the South Atlantic Council's SSC (South Atlantic SSC) recommended ABCs for alternatives under Action 2-1. Indirect impacts of these alternatives on the physical and biological environments would depend on the resulting reduction or increase in the level of commercial king mackerel fishing effort in the Atlantic region. The alternatives under Action 2-1 would not functionally have any impact on harvest but decisions made in Action 2-2 are directly related to Action in 2-1 and may lead to an increase in the ACLs.

Table 4.2.1. Recommendations from the October 2014 SSC meeting for Atlantic Migratory Group King Mackerel. ABC recommendations are in million pounds.

P*[1]= 0.325	ABC HIGH	ABC MED	ABC LOW	Buffer between ABC and OFL		
Fishing year				HI	MED	LO

	Alt 2	Alt 3	Alt 4			
2016/17	17.4	16.5	15.4	12%	16%	22%
2017/18	15.8	14.3	12.9	14%	22%	29%
2018/19	14.1	12.9	11.9	15%	23%	28%
2019/20	12.7	12.1	11.6	17%	21%	24%

[1] P* refers to the probability for overfishing to occur at the harvest level. For example, when the SSC requests projections for P*=50%, the SEFSC provides projections for landings that are expected to result in only a 50% probability of causing overfishing of the stock.

Changes in the ABCs would result in changes to the ACLs for Atlantic king mackerel since the ACL is a function of the ABC. The amount of change depends on which alternatives are selected as preferred in Action 2-2. **Alternatives 2 (Preferred) – 4** would all result in an increase in the ABC in the 2016/17 fishing year, and although the ABCs decrease each fishing year, they will still remain higher than the ABC that is currently in place. Any increase in harvest can have a negative biological impact on a species. However, all of the alternatives under this action were recommended by the South Atlantic SSC who are charged with establishing ABCs that would not lead to overfishing or result in negative biological impacts. **Alternative 4** would achieve the most conservative values of ABC, and any biological impacts would be minimized. Although conservative ABCs may provide the greatest biological benefit to the species, higher ABCs would not be expected to substantially impact the stock as long as harvest is maintained at a sustainable level and overfishing does not occur. Revising the ABC would not, in and of itself, affect protected species or essential fish habitat since immediate harvest objectives are based off, and not set by, the ABC.

4.2.1.2 Direct and Indirect Effects on the Economic Environment

Alternatives 2 (Preferred) – 4 would increase the ABCs for king mackerel above **Alternative 1** (No Action). However, Action 2-1 by itself has no measurable economic effects except in terms of how it influences the selection of the ACL under Action 2-2.

The differences among the alternatives rely on future projected levels of recruitment. An optimistic assumption of high recruitment (**Preferred Alternative 2**) could have future direct long-term biological effects that result in a smaller biomass of king mackerel. A smaller biomass could have adverse economic effects making it more difficult to catch king mackerel, thus reducing economic efficiency. Conversely, an ABC that is set too low would keep fishermen from catching additional fish resulting in direct negative economic effects.

Assuming that none of the alternatives would result in detrimental long term biological effects, a higher ABC would be expected to result in greater positive, direct economic effects. From least to greatest, direct positive economic effects would result from **Alternative 1** (No Action), **Alternative 4**, **Alternative 3**, and then **Preferred Alternative 2**.

4.2.1.3 Direct and Indirect Effects on the Social Environment

Changes in the ABC for any stock can have direct effects on fishermen and fishing communities because the ABC will define the upper limit of the ACL. Once the ACL is met or exceeded, any accountability measures (AMs) that restrict or close harvest could negatively affect the commercial fleet, for-hire fleet, and private anglers. In general, a higher ABC level and associated potential higher ACL would result in greater short-term social and economic benefits. Additionally, using the most recent and accurate information to set ACLs would be the most beneficial to all resource users.

The variation under **Alternatives 2 (Preferred) – 4** for ABC recommendations from the South Atlantic SSC allows the Councils flexibility to consider and respond to changing conditions of a dynamic stock. The ABC levels under **Preferred Alternative 2** are most likely to result in the highest ACL levels in Action 2-2, and would be expected to have the most short-term benefits to fishermen, followed by **Alternative 3** and **Alternative 4**. Because **Alternative 1** (No Action) would not revise the ABC levels for Atlantic king mackerel using the most recent stock assessment, this may have negative effects on fishermen and fishing communities by not allowing optimal yield and maximized access to the resource.

4.2.1.4 Direct and Indirect Effects on the Administrative Environment

The administrative impacts of **Alternatives 2 (Preferred) – 4** would be minimal, and not differ much from **Alternative 1** (No Action). The administrative burden would be greater for Action 2-2 than for Action 2-1, because Action 2-2 considers revisions to ACLs, which include the need to monitor landings and implement AMs when ACLs are met or are projected to be met. Action 2-1 would revise the ABCs but may not necessarily result in changes to the ACLs.

4.2.2 Action 2-2 – Revise ACLs, Commercial Quotas, and Recreational ACT for Atlantic Migratory Group King Mackerel

Alternative 1: No action – Retain the ACL and ACT for Atlantic Migratory Group King Mackerel based on the previous ABC. ACL = OY = ABC.

Preferred Alternative 2: Revise the ACL based on the ABC levels selected under Action 2-1. ACL = OY = ABC.

Alternative 3: Establish ACL = OY = Deterministic equilibrium yield at $F_{30\%SPR}$ = 12.7 mp for fishing years 2016/17 through 2019/20.

Alternative 4: Establish ACL = OY = Deterministic equilibrium yield at 75% $F_{30\%SPR}$ = 11.6 mp for fishing years 2016/17 through 2019/20.

Alternative 5: Establish ACL = OY = 90% ABC based on the ABC levels selected under Action 2-1.

Note: 75% of F_{MSY} (which is the same as 75% $F_{30\%SPR}$ because 30% SPR is the proxy for MSY) is usually in the terms of reference (TORs) of all assessments. 75% F_{MSY} was the old OY, as yield at the long term F_{MSY} (MSY) was the old OFL. It is still part of the TORs in case the South Atlantic Council wants to choose that strategy to have stable catches rather than following the P recommendation and have changing catch levels each year.*

Note: Landings are reported in mixed whole and gutted weights. Therefore, ACLs and quotas will also be in mixed weights consistent with current regulations.

4.2.2.1 Direct and Indirect Effects on the Physical and Biological Environments

Management actions that affect the biological and physical environment relate to the impacts of fishing on a species' population size, life history, the role of the species within its habitat and the health of the habitat itself. Removal of fish from the population through fishing can reduce the overall population size if harvest is not maintained at sustainable levels. Impacts of these alternatives on the biological environment would depend on the resulting reduction or increases in the level of fishing as a result of each alternative. Harvesting fish species using techniques that may be destructive to the habitat could impact the physical environment. However, harvest of king mackerel is done primarily through hook and line and gillnet gear, neither of which has much of an impact on the physical environment.

Potential biological effects under the alternatives were analyzed by obtaining Atlantic group king mackerel landings and logbook data from the Southeast Fisheries Science Center (SEFSC). The landings and logbook data include all commercial king mackerel landings from Maine through Dade County on Florida's southeastern coast.

The monthly Atlantic group king mackerel commercial landings from 2009 through 2015 are variable. The highest landings occurred in the 2009 and 2010, and the lowest landings occurred in the recent years of 2013 and 2014 (Figure 4.2.2.1).

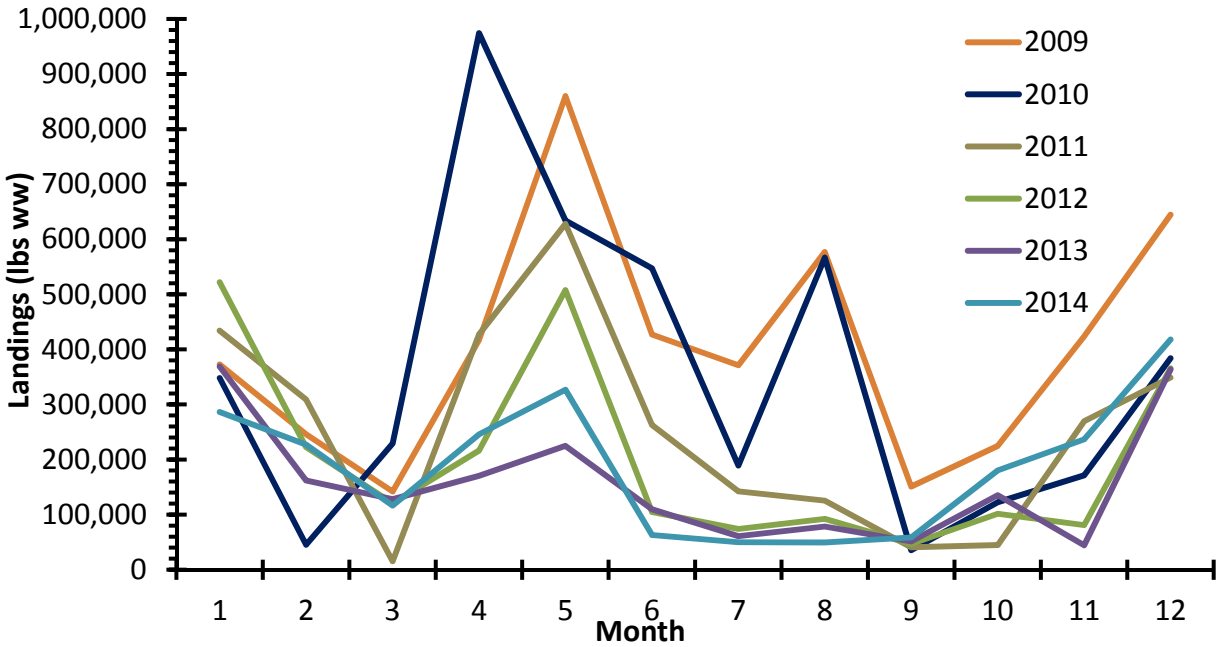

Figure 4.2.2.1. Atlantic migratory group king mackerel commercial landings by month from 2009 through 2015.
Source: SERO ALS

To fully understand the variability in annual landings, three different landings scenarios were compared to the proposed ACLs. The first scenario captured how the proposed ACLs would work during a period of maximum landings, and used 2009/2010 landings to compare to the potential ACLs. The next scenario compared the proposed ACLs to a period of minimum landings, and used 2013/2014 landings. The third scenario incorporated the average landings from 2009/2010 through 2013/2014 to represent the average landings over several years. These landings scenarios all followed the current fishing year of March 1st through the end of February.

The landings were also separated into the Atlantic Northern Zone (New York to North Carolina) and the Atlantic Southern Zone (South Carolina to the Dade/Monroe county line in Florida) to reflect the boundary being considered in Action 1 under Preferred Alternative 3. Figure 4.2.2.2 displays the three different landings scenarios for each zone.

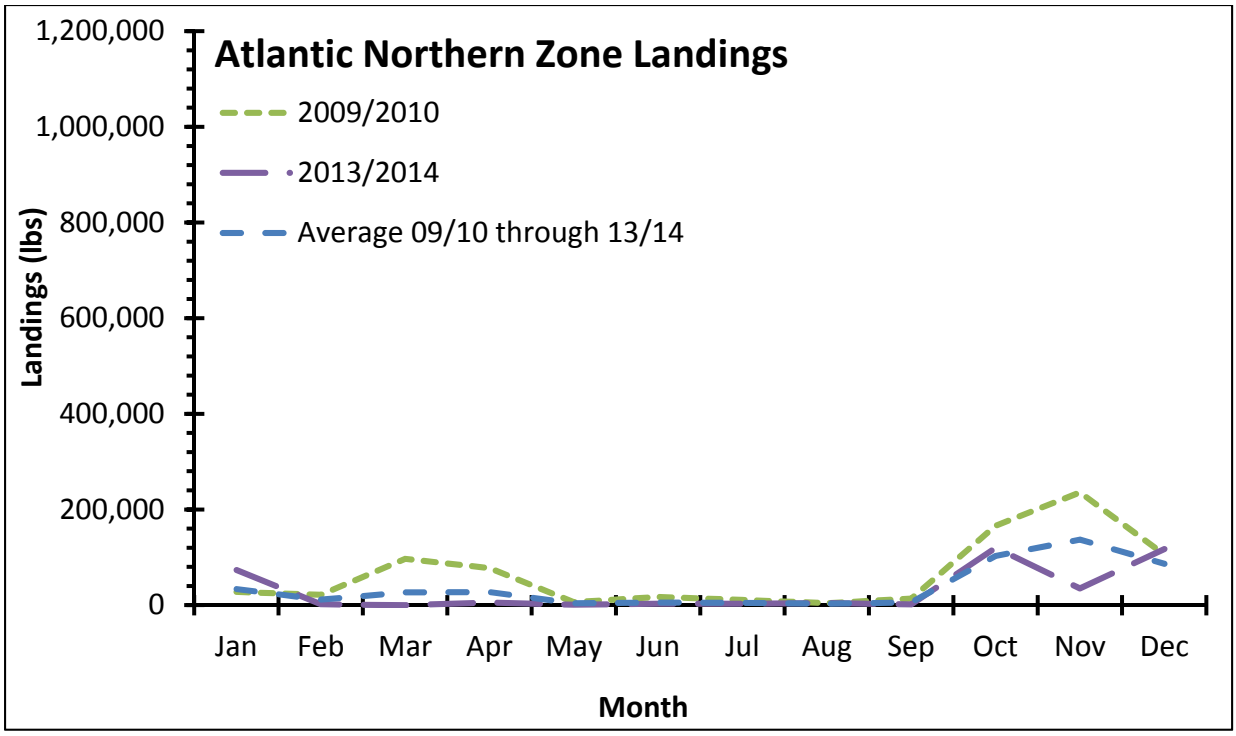

Figure 4.2.2.2. Atlantic migratory group king mackerel commercial landings by month from 2010 through 2015 following the current fishing season of March to February in the Atlantic Northern Zone, which is from New York to North Carolina. Three different landings scenarios were provided: 1) 2009/2010 landings; 2) 2013/2014 landings; and 3) average landings from 2009/2010 through 2013/2014.

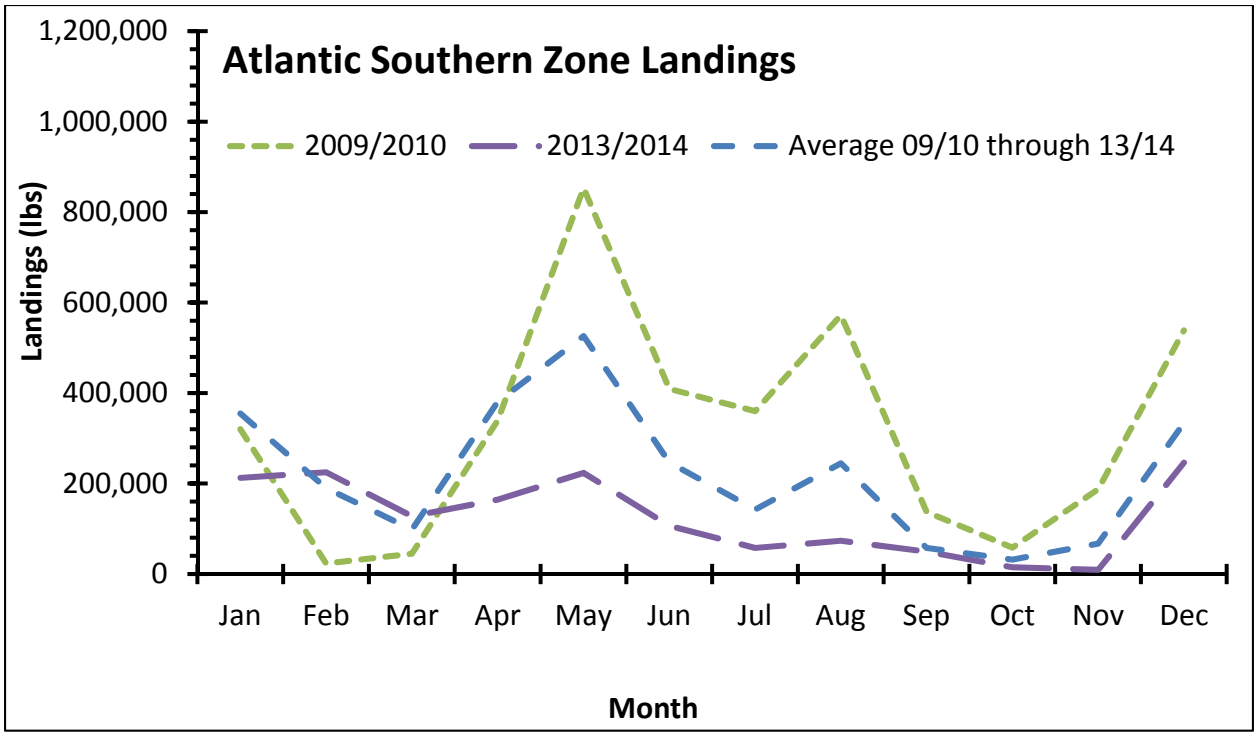

Figure 4.2.2.3. Atlantic migratory group king mackerel commercial landings by month from 2010 through 2015 following the current fishing season of March to February in the Atlantic Southern Zone, which is from South Carolina to the Dade/Monroe county line in Florida. Three different landings scenarios were provided: 1) 2009/2010 landings; 2) 2013/2014 landings; and 3) average landings from 2009/2010 through 2013/2014.

In general, higher ACLs correspond to higher levels of negative biological impact in that they allow for a higher removal of the target species from the population. However, the proposed changes to the commercial and recreational ACL, Atlantic Southern and Northern Zone quotas, and recreational ACT are based on the ABC recommendations from the South Atlantic SSC in Action 2-1. These recommendations are the best available science and ensure that harvest does not go over established ABC values in Action 2-1. Accountability measures have been established to ensure that overfishing does not occur.

Alternative 1 (No Action) would not change the current ACL based on the revised ABC in Action 2-1. The ACL would be set equal to the optimum yield (OY), which would be set equal to the ABC of 10.46 million pounds (mp) from the previous assessment. Under this alternative, ACL values would not change from the status quo regardless of whether the ABC values are revised in Action 2-1. This action would not be consistent with the most recent stock assessment (SEDAR 38 2014).

Preferred Alternative 2 would set the ACL equal to the ABC in Action 2-1, which would depend on the level of recruitment (high, medium or low) that the Councils determine to be appropriate for Atlantic king mackerel (Table 4.2.2.1). In Amendment 18, the Councils chose to set the ACL equal to the ABC (**Preferred Alternative 2**). Under this alternative, the highest ACL for the 2016/2017 fishing year would range from 15.4 mp – 17.4 mp (based on the

recruitment scenario chosen). Under all recruitment scenarios, the ACL would decrease each year with the lowest ACL ranging from 11.6 – 12.7 mp for the 2019/2020 fishing year.

Table 4.2.2.1.1. Possible outcomes under Alternative 2 based on the alternative selected in Action 2-1. The recreational allocation is 62.9% and the commercial allocation is 37.1%. Commercially, the Atlantic Northern Zone allocation is 23.04% and the Atlantic Southern Zone allocation is 76.96% (see Appendix E for details on how the Atlantic Northern and Southern Zone quota allocations were recalculated using the SEDAR 38 boundary).

ACL = ABC HIGH Recruitment Scenario **Action 2-1, Alt 2**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	17.4 mp	6.5 mp	1,497,600	5,002,400	10.9 mp	10.1 mp
2017/18	15.8 mp	5.9 mp	1,359,360	4,540,640	9.9 mp	9.2 mp
2018/19	14.1 mp	5.2 mp	1,198,080	4,001,920	8.9 mp	8.3 mp
2019/20	12.7 mp	4.7 mp	1,082,880	3,617,120	8.0 mp	7.4 mp
ACL = ABC MEDIUM Recruitment Scenario **Action 2-1, Alt 3**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	16.5 mp	6.1 mp	1,405,440	4,694,560	10.4 mp	9.7 mp
2017/18	14.3 mp	5.3 mp	1,221,120	4,078,880	9.0 mp	8.4 mp
2018/19	12.9 mp	4.8 mp	1,105,920	3,694,080	8.1 mp	7.5 mp
2019/20	12.1 mp	4.5 mp	1,036,800	3,463,200	7.6 mp	7.1 mp
ACL = ABC LOW Recruitment Scenario **Action 2-1, Alt 4**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	15.4 mp	5.7 mp	1,313,280	4,386,720	9.7 mp	9.0 mp
2017/18	12.9 mp	4.8 mp	1,105,920	3,694,080	8.1 mp	7.5 mp
2018/19	11.9 mp	4.4 mp	1,013,760	3,386,240	7.5 mp	7.0 mp
2019/20	11.6 mp	4.3 mp	990,720	3,309,280	7.3 mp	6.8 mp

*ACT values are calculated based on formula from CMP Amendment 18 using the average PSE from 2005-2009.

Alternative 3 is based on the South Atlantic Council SSC's recommendation to use the long-term equilibrium yield at $F_{30\%SPR}$, setting the ACL at 12.7 mp for fishing years 2016/2017 through 2019/2020. Table 4.2.2.2 identifies the ACLs, quotas, and recreational ACT under this alternative.

Table 4.2.2.1.2. ACLs, quotas and recreational ACT under Action 2-2, Alternative 3.

Alternative 3	
Atlantic King Mackerel ACL	12.7 mp
Commercial ACL	4.7 mp
Atlantic Northern Zone Quota	1,082,880 lbs
Atlantic Southern Zone Quota	3,617,120 lbs
Recreational ACL	8.0 mp
Recreational ACT*	7.4 mp

Alternative 4 includes an additional buffer by setting the ACL at 75% of the long-term equilibrium yield, equal to 11.6 mp for fishing years 2016/2017 through 2019/2020. Table 4.2.2.3 identifies the ACLs, quotas and recreational ACT under this alternative.

Table 4.2.2.1.3. ACLs, quotas, and recreational ACT under Action 2-2, Alternative 4.

Alternative 4	
Atlantic King Mackerel ACL	11.6 mp
Commercial ACL	4.3 mp
Atlantic Northern Zone Quota	990,720 lbs
Atlantic Southern Zone Quota	3,309,280 lbs
Recreational ACL	7.3 mp
Recreational ACT*	6.8 mp

*ACT value calculated based on formula from CMP Amendment 18, using the average PSE from 2005-2009.

Similar to **Preferred Alternative 2**, the ACL in **Alternative 5** would depend on the alternative selected by the Councils in Action 2-1. Table 4.2.2.4 lists the ACLs under **Alternative 5**. Under this alternative, the highest ACL for the 2016/2017 fishing year would range from 13.9 mp – 15.7 mp (based on the recruitment scenario chosen). Under all recruitment scenarios, the ACL would decrease each year with the lowest ACL ranging from 10.4 mp – 11.4 mp for the 2019/2020 fishing year.

Table 4.2.2.1.4. Possible outcomes under Alternative 5 based on alternatives in Action 2-1. The recreational allocation is 62.9% and the commercial allocation is 37.1%. Commercially, the Atlantic Northern Zone is 23.04% and the Atlantic Southern Zone allocation is 76.96% (see Appendix E for details on how the Atlantic Northern and Southern Zone quota allocations were recalculated using the SEDAR 38 boundary).

ACL = 90% ABC HIGH Recruitment Scenario **Action 2-1, Alt 2**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	15.7 mp	5.8 mp	1,336,320	4,463,680	9.9 mp	9.2 mp
2017/18	14.2 mp	5.3 mp	1,221,120	4,078,880	8.9 mp	8.3 mp
2018/19	12.7 mp	4.7 mp	1,082,880	3,617,120	8.0 mp	7.4 mp
2019/20	11.4 mp	4.2 mp	967,680	3,232,320	7.2 mp	6.7 mp
ACL = 90% ABC MEDIUM Recruitment Scenario **Action 2-1, Alt 3**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	14.9 mp	5.5 mp	1,267,200	4,232,800	9.4 mp	8.7 mp
2017/18	12.9 mp	4.8 mp	1,105,920	3,694,080	8.1 mp	7.5 mp
2018/19	11.6 mp	4.3 mp	990,720	3,309,280	7.3 mp	6.8 mp
2019/20	10.9 mp	4.0 mp	921,600	3,078,400	6.9 mp	6.4 mp
ACL = 90% ABC LOW Recruitment Scenario **Action 2-1, Alt 4**						
Fishing year	**Total Atl KM ACL**	**Commercial**			**Recreational**	
		Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	13.9 mp	5.2 mp	1,198,080	4,001,920	8.7 mp	8.1 mp
2017/18	11.6 mp	4.3 mp	990,720	3,309,280	7.3 mp	6.8 mp
2018/19	10.7 mp	4.0 mp	921,600	3,078,400	6.7 mp	6.2 mp
2019/20	10.4 mp	3.9 mp	898,560	3,001,440	6.5 mp	6.0 mp

*ACT values are calculated based on formula from CMP Amendment 18 using the average PSE from 2005-2009.

Alternative 5 may have a greater positive biological effect on the Atlantic king mackerel stock than **Preferred Alternative 2** because it would create a buffer between the ACL/OY and ABC. Creating such a buffer would provide greater assurance that overfishing would be prevented, and the long-term average biomass would more likely be near or above the spawning stock biomass

(SSB) level necessary to support harvest at maximum sustainable yield (SSB_{MSY}). The National Standard 1 guidelines indicate the ACL may be set equal to the ABC. Setting a buffer between the ACL and ABC would be appropriate in situations where there is uncertainty in whether management measures are constraining fishing mortality to target levels. All of the alternatives are based on recommendations for ABC (Action 2-1) from the South Atlantic SSC and take into account scientific uncertainty, which inherently provides some degree of protection from overfishing. However, the 2009/2010 fishing year was the highest in recent years and total landings did not come close to reaching any of the ACLs proposed for the king mackerel portion of the CMP fishery in **Alternatives 1 – 5**.

Commercial quotas for each zone are also being modified by this action based on the alternative selected in Action 2-1 and this action. Due to the large range of possible quotas proposed in Action 2-2 (based on Action 2-1), the analysis looked at a range of potential quotas (Low, Medium, and High) that encompasses the entire suite of possible alternatives. Potential closures for each quota are predicted based on a maximum landings scenario, using 2009/2010 landings (Table 4.2.2.5). The analysis using the low, medium and high quotas carries forward to the effects analyses for Actions 4 and 5 in this amendment.

For the Atlantic Northern Zone, there are no early closure dates predicted under any quotas based on the proposed ACLs in **Alternatives 2 (Preferred) – 5** and as such it is expected the fishery would continue year-round. Total season landings under the maximum landings scenario were 786,101 lbs ww in the Atlantic Northern Zone. The lowest quota being considered is 898,560 lbs (Action 2-1/**Alternative 4**; Action 2-2/**Alternative 5**).

The three potential Atlantic Southern Zone quotas analyzed were:

- *High Quota* of 5,002,400 pounds (lbs), associated with Action 2-1/Preferred Alternative 2, and Action 2-2/ **Preferred Alternative 2** for fishing year 2016/2017.
- *Medium Quota* of 3,694,080 lbs mostly closely associated with the Action 2-1/Preferred Alternative 2 and Action 2-2/ **Preferred Alternative 2** for fishing year 2016/2017, as well as Action 2-1/ Alternative 4; Action 2-2/**Preferred Alternative 2** for the fishing year of 2017/2018. The *Medium Quota* is slightly higher than the Atlantic Southern Zone quota proposed under **Alternative 3** (3,617,120 lbs).
- *Low Quota* of 3,001,440 lbs is associated with Action 2-1/**Alternative 4**; Action 2-2/ **Alternative 5** 2019/2020 fishing year.

In the Atlantic Southern Zone, a closure is predicted based on 2009/2010 landings (Table 4.2.2.5). Under the high quota scenario, there would not be a closure. Under the medium quota scenario, a closure would be expected around January 19. The quota specified under **Alternative 3** is slightly lower than that analyzed in the medium quota scenario so it would be expected that under **Alternative 3** the closure date would be before January 19. The quota under **Alternative 4** lies between that of the medium and low quota scenario and as such the fishery would be expected to close sometime between December 3 and January 19.

In summary, for periods of higher landings (such as the 2009/2010 fishing year), there may be an in-season closure for the Atlantic Southern Zone if the ACL or ACLs are in the middle or low range of potential ACLs in this action. However, under periods of low landings (such as the 2013/14 fishing year) or average landings, there would be no early closure expected for the

Atlantic Southern Zone. The possibility of negative biological impacts through excessive fishing pressure on the species should be mitigated by the closure of the Atlantic Southern Zone if the ACL is met or projected to be met.

Table 4.2.2.1.5. Predicted closure dates for the commercial season in the Atlantic Southern Zone for Action 2-2. The closure dates were predicted for the Atlantic migratory group in the Atlantic Southern Zone using the highest landings scenario (2009/2010 landings).

	Season: Mar-Feb
HIGH Quota	5,002,400
Closure Date	No Closure
Medium Quota	3,694,080
Closure Date	19-Jan
Low Quota	3,001,440
Closure Date	3-Dec

The recreational ACTs would also be modified under each alternative based on a formula from Amendment 18 to the CMP FMP using the average probabilistic standard error from 2005-2009. The recreational ACT is set below the ACLs to account for management uncertainty and provide greater assurance overfishing does not occur. Recreational ACTs under each alternative are listed in Tables 4.2.2.1- 4.2.2.4.

In a 2015 biological opinion, NMFS determined the gillnet gear used in the federal CMP fisheries of the Atlantic and GOM may have adversely affected sea turtles, smalltooth sawfish, and Atlantic sturgeon in the past via entanglement and, in the case of sea turtles, via forced submergence. Commercial and recreational hook-and-line gear and commercial cast net gear have not likely adversely affected these species. The biological opinion provides an incidental take statement for species which may interact with the CMP fisheries.

The impacts from **Alternatives 2 (Preferred) – 5** on sea turtles, smalltooth sawfish, and Atlantic sturgeon are unclear. If alternatives that increase ACLs lead to greater fishing effort in the CMP fishery as a whole, this could increase adverse effects to sea turtles, smalltooth sawfish and Atlantic sturgeon. However, the proposed ACLs are higher than current landing levels and unless there is a directed effort to increase harvest of Atlantic group king mackerel, the biological impacts are expected to remain minor. Further, take of these listed species is monitored under the terms and conditions of the biological opinion, and re-initiation of consultation is required if the amount or extent of the taking specified in the incidental take statement is exceeded.

4.2.2.2 Direct and Indirect Effects on the Economic Environment

The economic effects of Action 2-2 depend on the level of ABC selected in Action 2-1. **Alternative 1** (No Action) and **Preferred Alternative 2** both set ABC=ACL=OY. The ACL for **Alternative 1** (No Action) is 10.46 mp, whereas the ACL under **Preferred Alternative 2** is dependent on fishing year and recruitment scenario. In 2016/17, the ACL under **Preferred**

Alternative 2 would range from 15.4 to 17.4 mp and would decrease each fishing year until 2019/20 where the ACL would range between 11.6 and 12.7 mp.

Because fishing boundaries for king mackerel may change with Action 1, direct comparisons between past landings history and the proposed alternatives are difficult to make. Based on Table 3.4.1.1, the highest fishing year landings from the 2000/2001 through 2013/2014 fishing years in the South Atlantic region was 3,561,139 lbs for the commercial sector in 2009/2010. The average price per pound was $2.13 in 2014. All alternatives in Action 2-2 propose commercial sector ACLs that are above the historical landings from 2000/2001 through 2013/2014 seasons.

Only **Alternative 5** has recreational sector ACLs that are lower in some seasons than the highest-level landings from 2000/2001 through 2013/2014 (7.129 mp, 2007/2008; Table 3.4.2.1). Under the medium recruitment scenario, the recreational sector ACL would be 6.9 mp for 2019/2020. Under the low recruitment scenario, the recreational sector ACL would be 6.7 mp for 2018/2019 and 6.5 mp for 2019/2020. Recreationally, there is a two-fish bag limit for king mackerel in Florida and a three-fish bag limit in states north of Florida. According to Carter and Liese (2102), the consumer surplus to be able to catch a third king mackerel was $67 (in 2014 dollars). The average weight for a recreationally caught Atlantic group king mackerel, based on Stock Assessment and Fishery Evaluation (SAFE) reports from 2010 through 2014, was 10.883 lbs ww (Mike Errigo, SAFMC, personal communication).

What is unknown is whether in future years each sector would be able to land its entire ACL. The expected economic values for king mackerel for the commercial and recreational sectors are shown in Table 4.2.2.2.1 for **Preferred Alternative 2;** Table 4.2.2.2.2 for **Alternative 3** and **Alternative 4;** and Table 4.2.2.2.3 for **Alternative 5**.

Table 4.2.2.2.1. Expected value of commercial and recreational landings of South Atlantic migratory group king mackerel for Preferred Alternative 2 based on ACL calculations from Action 2-1.

ACL = ABC HIGH Recruitment Scenario **Action 2-1, Preferred Alternative 2**						
		Commercial			**Recreational**	
Fishing year	**Total Atl KM ACL**	Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	17,400,000	$13,845,000	$3,189,888	$10,655,112	$67,101,663	$62,176,771
2017/18	15,800,000	$12,567,000	$2,895,437	$9,671,563	$60,945,547	$56,636,266
2018/19	14,100,000	$11,076,000	$2,551,910	$8,524,090	$54,789,431	$51,095,762
2019/20	12,700,000	$10,011,000	$2,306,534	$7,704,466	$49,248,927	$45,555,258
ACL = ABC MEDIUM Recruitment Scenario **Action 2-1, Alt 3**						
		Commercial			**Recreational**	
Fishing year	**Total Atl KM ACL**	Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	16,500,000	$12,993,000	$2,993,587	$9,999,413	$64,023,605	$59,714,324
2017/18	14,300,000	$11,289,000	$2,600,986	$8,688,014	$55,405,043	$51,711,374
2018/19	12,900,000	$10,224,000	$2,355,610	$7,868,390	$49,864,539	$46,170,869
2019/20	12,100,000	$9,585,000	$2,208,384	$7,376,616	$46,786,481	$43,708,423
ACL = ABC LOW Recruitment Scenario **Action 2-1, Alt 4**						
		Commercial			**Recreational**	
Fishing year	**Total Atl KM ACL**	Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	15,400,000	$12,141,000	$2,797,286	$9,343,714	$59,714,324	$55,405,043
2017/18	12,900,000	$10,224,000	$2,355,610	$7,868,390	$49,864,539	$46,170,869
2018/19	11,900,000	$9,372,000	$2,159,309	$7,212,691	$46,170,869	$43,092,811
2019/20	11,600,000	$9,159,000	$2,110,234	$7,048,766	$44,939,646	$41,861,588

Table 4.2.2.2.2. Expected value of commercial and recreational landings of South Atlantic king mackerel for Alternative 3 and Alternative 4.

	Alternative 3		**Alternative 4**	
Atlantic King Mackerel ACL	12.7 mp	$59,259,927	11.6 mp	$54,098,646
Commercial ACL	4.7 mp	$10,011,000	4.3 mp	$9,159,000
Northern Zone Quota	1,082,880 lbs	$2,306,534	990,720 lbs	$2,110,234
Southern Zone Quota	3,617,120 lbs	$7,704,466	3,309,280 lbs	$7,048,766
Recreational ACL	8.0 mp	$49,248,927	7.3 mp	$44,939,646
Recreational ACT	7.4 mp	$45,555,258	6.8 mp	$41,861,588

Table 4.2.2.2.3. Expected value of commercial and recreational landings of South Atlantic king mackerel for Alternative 5 based on ACL calculations from Action 2-1.

ACL = 90% ABC HIGH Recruitment Scenario **Action 2-1, Preferred Alternative 2**						
		Commercial			**Recreational**	
Fishing year	**Total Atl KM ACL**	Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	15.7 mp	$12,354,000	$2,846,362	$9,507,638	$60,945,547	$56,636,266
2017/18	14.2 mp	$11,289,000	$2,600,986	$8,688,014	$54,789,431	$51,095,762
2018/19	12.7 mp	$10,011,000	$2,306,534	$7,704,466	$49,248,927	$45,555,258
2019/20	11.4 mp	$8,946,000	$2,061,158	$6,884,842	$44,324,034	$41,245,977
ACL = 90% ABC MEDIUM Recruitment Scenario **Action 2-1, Alternative 3**						
		Commercial			**Recreational**	
Fishing year	**Total Atl KM ACL**	Comm ACL	Northern Zone Quota (lbs)	Southern Zone Quota (lbs)	Rec ACL	Rec ACT
2016/17	14.9 mp	$11,715,000	$2,699,136	$9,015,864	$57,867,489	$53,558,208
2017/18	12.9 mp	$10,224,000	$2,355,610	$7,868,390	$49,864,539	$46,170,869
2018/19	11.6 mp	$9,159,000	$2,110,234	$7,048,766	$44,939,646	$41,861,588
2019/20	10.9 mp	$8,520,000	$1,963,008	$6,556,992	$42,477,200	$39,399,142

The alternatives can be ranked from lowest to highest positive direct economic effects. If the Councils choose the "low recruitment" ABC in Action 2-1 (Alternative 4) or the "medium recruitment" ABC (Alternative 3), the rankings for Action 2-2 would be **Alternative 4**, **Alternative 5**, **Alternative 3**, and then **Alternative 1** (No Action)**/Preferred Alternative 2**. If the Councils choose the "high recruitment" ABC in Action 2-1, the rankings for Action 2-2 would be **Alternative 4**, **Alternative 3**, **Alternative 5**, and then **Alternative 1** (No Action)**/Preferred Alternative 2**.

4.2.2.3 Direct and Indirect Effects on the Social Environment

As discussed for Action 2-1, higher catch limits are expected to be more beneficial to fishermen and fishing communities by increasing access to the Atlantic group king mackerel resource, as long as overharvest is not occurring to negatively affect the stock in the long term. Once the ACL is met or exceeded, any accountability measures (AMs) that restrict or close harvest could negatively affect the commercial fleet, for-hire fleet, and private anglers. In general, the higher the ACL, the greater the short-term social and economic benefits that would be expected to accrue, assuming landings and effort information are up-to-date and accurate to allow sustainable harvest. Additionally, adjustments to an ACL based on updated information from a stock assessment (**Alternatives 2 – 5**) would be the most beneficial in the long term to fishermen and communities, because ACLs would be based on current conditions (unlike under **Alternative 1** (No Action).

Preferred Alternative 2 would establish the highest ACL and associated quotas for Atlantic group king mackerel and is supported by public input and a South Atlantic AP recommendation. A more conservative approach with lower ACLs under **Alternative 3, Alternative 4,** and **Alternative 5** may be more beneficial to fishermen in the long term by reducing risk and incorporating uncertainty, particularly because of the decrease in landings and recruitment over the last few years (SEDAR 38 2014). However, Atlantic group king mackerel are not overfished and are not experiencing overfishing, and the OFL/ABC/ACL system already has buffers in place to minimize the risk of overfishing.

4.2.2.4 Direct and Indirect Effects on the Administrative Environment

Alternative 1, **Alternative 3** and **Alternative 4** would establish ACLs that remain constant from the 2016/2017 through 2019/2020 fishing years. **Preferred Alternative 2** and **Alternative 5** would establish an ACL that changes each fishing year between 2016/2017 and 2019/2020. **Alternative 2** and **Alternative 5** may be slightly more administratively burdensome than **Alternative 1**, **Alternative 3**, and **Alternative 4,** due to an increase in education and outreach related to the changing ACLs, quotas, and the recreational ACT each fishing year. However, these impacts are expected to be minor, as the infrastructure exists to make these tasks easier. Alternatives that result in higher ACLs for species could slightly reduce administrative burdens because the likelihood of triggering AMs could be reduced; **Alternatives 2 – 5** would result in an increase in the ACL over the status quo (**Alternative 1**).

4.3 Action 3 – Sale of Incidental Catch of Atlantic Migratory Group King Mackerel Caught in the Shark Drift Gillnet Fishery

Alternative 1: No action – Retention and sale of Atlantic king mackerel caught with gillnet as incidental catch in the gillnet portion of the commercial shark fishery remains prohibited.

Alternative 2: Allow retention and sale of Atlantic king mackerel caught with gillnet as incidental catch in the gillnet portion of the commercial shark fishery for any vessel with a valid shark directed commercial permit AND valid federal king mackerel commercial permit. The king mackerel must be sold to a dealer with the Gulf and South Atlantic federal dealer permit. For shark gillnet trips in the EEZ off Florida, no more than 2 king mackerel per crew member can be on board, and no more than 2 king mackerel per crew member can be sold from the trip. For shark gillnet trips in the EEZ north of the GA/FL line, no more than 3 king mackerel per crew member can be on board, and no more than 3 king mackerel per crew member can be sold from the trip.

Preferred Alternative 3: Allow retention and sale of Atlantic king mackerel caught with gillnet as incidental catch in the gillnet portion of the commercial shark fishery for any vessel with a valid shark directed commercial permit AND valid federal king mackerel commercial permit. The king mackerel must be sold to a dealer with the Gulf and South Atlantic federal dealer permit. For shark gillnet trips in the Southern Zone, no more than 2 king mackerel per crew member can be on board, and no more than 2 king mackerel per crew member can be sold from the trip. For shark gillnet trips in the Northern Zone, no more than 3 king mackerel per crew member can be on board, and no more than 3 king mackerel per crew member can be sold from the trip.

4.3.1 Direct and Indirect Effects on the Physical and Biological Environments

Under **Alternative 1** (No Action), incidentally harvested king mackerel are currently discarded. Prior to Amendment 20A to the CMP FMP (GMFMC and SAFMC 2014), fishermen with federal commercial shark permits and federal commercial king mackerel permits could sell the bag limit of king mackerel incidentally caught on shark gillnet trips. However, Amendment 20A prohibited bag limit sales of incidentally caught king mackerel in South Atlantic Council jurisdictional waters. Gillnet gear is not an authorized gear type for king mackerel in the South Atlantic, further precluding those incidentally harvested king mackerel from being sold.

Alternatives 2 and **3 (Preferred)** would establish an incidental catch allowance and would allow the retention and sale of Atlantic migratory group king mackerel caught with drift gillnets in the shark drift gillnet fishery for any vessel that holds both a valid shark directed commercial permit and a valid federal king mackerel commercial permit. Under **Alternatives 2** and **3 (Preferred)**, king mackerel could be sold to a dealer operating with a southeast federal seafood dealer permit. Landings data indicate that a small number of fishermen have landed king mackerel on gillnet trips targeting sharks.

Under **Alternative 2**, the incidental catch allowance would be limited to two king mackerel per crewmember to be retained and sold only for trips off Florida. For shark gillnet trips in the exclusive economic zone (EEZ) north of the Georgia/Florida state line, no more than three king mackerel per crewmember would be allowed to be retained or sold from a trip. This is consistent with current recreational king mackerel bag limits in those areas. Table 2.3.1 indicates the number of king mackerel harvested from shark gillnet trips off Florida in the past five years. There were no gillnet trips with shark and king mackerel in Georgia or South Carolina in the last five years.

Under **Preferred Alternative 3**, the incidental catch allowance would be limited to two king mackerel per crewmember to be retained and sold only for trips in the Atlantic Southern Zone. For shark gillnet trips in the Atlantic Northern Zone, no more than three king mackerel per crewmember would be allowed to be retained or sold from a trip. This would allow consistent commercial regulations within each zone.

King mackerel are incidentally caught in the shark gillnet fishery and, most of the time, fish caught in gillnets are dead when harvested. None of these alternatives are expected to have noticeable biological impacts on king mackerel because the proposed incidental catch allowance of king mackerel by the shark gillnet fishery is small enough to avoid a directed fishery and these fish incidentally caught in the gillnets will be dead.

4.3.2 Direct and Indirect Effects on the Economic Environment

Table 2.3.1 shows characteristics of trips where king mackerel was landed in shark gill nets from 2010 through 2014 in Florida. In those years there was an average of 27.4 trips where an average of 60.8 lbs of king mackerel were landed. This would result in an average of 1,666 lbs of king mackerel landed in shark gill nets for those years. With a 2014 average price per pound of $2.87, the average annual ex-vessel value was $4,781. Both **Alternative 2** and **Preferred Alternative 3** are expected to have greater positive direct economic effects for harvesters than **Alternative 1** (No Action) assuming neither **Alternative 2** nor **Preferred Alternative 3** would cause the commercial portion of the ACL to be caught significantly sooner because at least some of the king mackerel that otherwise would have been dead discards in shark drift gillnets could be sold. Should fishermen be allowed to sell king mackerel from shark gillnets, **Preferred Alternative 3** would be slightly more restrictive than **Alternative 2** for those fishing off of South Carolina and Georgia because under **Alternative 2** each crew member in South Carolina and Georgia would be allowed to keep three king mackerel (same as the recreational bag limit in those states) versus under **Preferred Alternative 3** where individual crew members off South Carolina and Georgia would be allowed to keep only two king mackerel each (same as the Florida recreational bag limit). However, there were no gillnet trips with shark and king mackerel in Georgia or South Carolina in the last five years.

4.3.3 Direct and Indirect Effects on the Social Environment

Because bag limit sales of king mackerel in the South Atlantic region were prohibited in Amendment 20A (GMFMC and SAFMC 2013a), the commercial shark fishermen who previously sold incidental catch of king mackerel are required to discard king mackerel on shark

gillnet trips. The number of participants and average pounds of king mackerel on these trips are small (Table 2.3.1). Under **Alternatives 2** and **3 (Preferred)**, the fishermen would be allowed to a limited amount of incidental catch and reduce discards of king mackerel, which would help reduce waste and to increase the profits from the trip. The small number of fish that may be sold is not expected to cause any directed effort for king mackerel on shark gillnet trips. Under **Alternative 1** (No Action), the fishermen would have to continue to discard incidental catch of king mackerel on shark gillnet trips and would not be able to maximize profits on these trips.

4.3.4 Direct and Indirect Effects on the Administrative Environment

The administrative impacts associated with the alternatives are expected to be minimal and would largely be associated with rulemaking, outreach, and enforcement. **Alternative 1** would have the least administrative impact as the retention and sale of Atlantic king mackerel caught as incidental catch in the gillnet portion of the commercial shark fishery would remain prohibited. Under **Alternative 2** and **Preferred Alternative 3**, landings of Atlantic king mackerel as incidental catch from the shark drift gillnet fishery would be sold to federally permitted seafood dealers, who report their landings to NMFS. As such, no additional administrative burden is expected with respect to monitoring the Atlantic king mackerel ACL.

4.4 Action 4 – Establish Commercial Split Seasons for Atlantic Migratory Group King Mackerel in the Southern Zone

Alternative 1: (No Action)**:** The commercial fishing year for Atlantic king mackerel is March 1 – February 28. The Southern Zone quota is allocated for the entire fishing year

Preferred Alternative 2: Allocate the Southern Zone quota for Atlantic king mackerel into two split season quotas: 60% to the period March 1 – September 30 (season 1) and 40% to the period October 1 – the end of February (season 2). Any remaining quota from season 1 would transfer to season 2. Any remaining quota from season 2 would not be carried forward. When the quota for the season is met or expected to be met, commercial harvest of king mackerel in the Southern Zone will be prohibited for the remainder of the season.

Alternative 3: Allocate the Southern Zone quota for Atlantic king mackerel into two split season quotas: 60% to the period March 1 – October 31 (season 1) and 40% to the period November 1 – the end of February (season 2). Any remaining quota from season 1 would transfer to season 2. Any remaining quota from season 2 would not be carried forward. When the quota for the season is met or expected to be met, commercial harvest of king mackerel in the Southern Zone will be prohibited for the remainder of the season.

Alternative 4: Allocate the Southern Zone quota for Atlantic king mackerel into two split season quotas: 50% to the period March 1 – October 31 (season 1) and 50% to the period November 1 – the end of February (season 2). Any remaining quota from season 1 would transfer to season 2. Any remaining quota from season 2 would not be carried forward. When the quota for the season is met or expected to be met, commercial harvest of king mackerel in the Southern Zone will be prohibited for the remainder of the season.

4.4.1 Direct and Indirect Effects on the Physical and Biological Environments

Alternative 1 (No action) would maintain the current fishing year for Atlantic king mackerel, which is March 1 – end of February. The entirety of the Atlantic Southern Zone quota would be allocated for the whole fishing year. This alternative would not result in any change to the current physical and biological environments but may have impacts on fishing behavior.

Under **Preferred Alternative 2**, the quota in the Atlantic Southern Zone would be divided into split season quotas with 60% to the period March 1 — September 30 (season 1) and 40% to the period October 1 – end of February (season 2). **Alternative 3** would also have a 60%/40% quota allocation but would change the time period from March 1 – October 31 (60%) and November 1 – end of February (40%). **Alternative 4** would allocate the Southern Zone quota into two split season quotas: 50% to the period March 1 – October 31 (season 1) and 50% to the period November 1 – the end of February (season 2).

Due to the large range of possible quotas proposed in Action 2-2 (based on Action 2-1), the analysis of potential closures looked at a range of quotas that encompass the entire suite of possible alternatives. The three Atlantic Southern zone quotas analyzed were the high quota of 5,002,040 lbs, medium quota of 3,694,080 lbs, and a low quota of 3,001,440 lbs. These quotas

encompass the range of potential ACLs and quotas. For a detailed explanation of how the quotas for analysis were selected, please see Section 4.2.2.1.

Possible closure dates were analyzed under a maximum landings scenario (2009/2010 landings), minimum landings scenario (2013/2014 landings), and average landings scenario (average landings from 2009/2011 through 2013/2014). For minimum and average landings scenarios, no closures were predicted under the possible Atlantic Southern Zone quotas under the high, medium, or low quotas.

However, under a maximum landings scenario, it is likely that landings similar to those in the 2009/2010 fishing year would be high enough to exceed the possible season 1 quota. Table 4.4.1.1 shows the predicted closure dates based on 2009/2010 landings for the three different quotas as well as the split season alternatives. Under the medium quota scenario, all of the action alternatives would result in a closure of season 1. Action 2, Preferred Alternative 3 is slightly lower than the medium quota, and it can be assumed that a closure would be implemented during the first season (if landings continue at 2009/2010 fishing levels). None of the alternatives in Action 4 would result in landings that would exceed the quota for season 2.

Table 4.4.1.1. Predicted closure dates for commercial season alternatives for Action 4. The closure dates were predicted for the Atlantic migratory group in the Atlantic Southern Zone using the highest landings scenario (2009/2010 landings). The closure dates are based on the commercial quotas of 5,002,400 lbs ww, 3,694,080 lbs ww, and 3,001,440 lbs ww. Cells with closure dates were highlighted in yellow.

	Action 4 Alternatives						
	Alternative 1	**Preferred Alternative 2**		**Alternative 3**		**Alternative 4**	
	Mar-Feb 100%	Mar-Sep 60%	Oct-Feb 40%	Mar-Oct 60%	Nov-Feb 40%	Mar-Sep 50%	Oct-Feb 50%
High Quota	5,002,400	3,001,440	2,000,960	3,001,440	2,000,960	2,501,200	2,501,200
Closure Date	No Closure	No Closure	No Closure	No Closure	No Closure	18-Aug	No Closure
Medium Quota	3,694,080	2,216,448	1,477,632	2,216,448	1,477,632	1,847,040	1,847,040
Closure Date	1-Jan	2-Aug	No Closure	2-Aug	No Closure	2-Jul	No Closure
Low Quota	3,001,440	1,800,864	1,200,576	1,800,864	1,200,576	1,500,720	1,500,720
Closure Date	8-Nov	28-Jun	No Closure	28-Jun	No Closure	7-Jun	No Closure

In summary, if Atlantic Southern Zone landings in March through September or October (season 1) are at a high level such as in the 2009/2010 fishing year, it is possible under the potential ACLs/quotas that are at or under the medium quota would result in an early closure for season 1, as early as July or August. Under a low quota scenario, closure dates would be reached in June. However, under an average or minimum landings scenario (which would encompass most years

in the past several fishing years), Atlantic Southern Zone landings would not reach any of the possible season 1 quotas to trigger an early closure.

Physical effects associated with changes in allocation and fishing year are usually dependent on resultant changes in fishing effort. Biological effects associated with changes in allocation and fishing year usually relate to changes in harvest. Because the catch is constrained by the ACL (established in Action 4.2.2.1), a change in the fishing year or temporal allocations within the Atlantic Southern Zone are not expected to lead to an increase in physical or biological impacts on the stock, other managed species, or protected species.

4.4.2 Direct and Indirect Effects on the Economic Environment

Determining the economic effects for Action 4 takes into account decisions made in Action 2. The analysis also uses data from Tables 2.4.1, 2.4.2, and 2.4.3 to determine economic effects. Tables 2.4.1 and 2.4.2 estimate the split quota amounts by season for the 2016/2017 through 2019/2020 fishing years. Table 2.4.3 shows Atlantic Southern Zone landings from the 1998/1999 through 2013/2014 fishing years for each proposed season. Averaged across all of the fishing years, none of the season averages exceeds the corresponding quota values in Tables 2.4.1 and 2.4.2. However, individual first season landings from several fishing years did exceed the corresponding quotas show in Tables 2.4.1 and 2.4.2. Table 4.4.2.1 shows landings by alternative and ACL level (Action 2-2) indicating which past fishing years would have exceeded the corresponding proposed quota. Data from the 2014/2015 and 2015/2016 fishing years were not included either because the fishing year is ongoing or the data are not ready for analysis. Whether or not future fishing seasons would exceed the first season quota could be affected by the Councils' choice of preferred alternative in Action 5. The more restrictive the trip limit imposed in Action 5, the less likely future years would exceed the first season quota.

Table 4.4.2.1. Atlantic king mackerel fishing years in which the Action 4 alternatives would have resulted in an in-season closure in the Atlantic Southern Zone for the first proposed season.

Alternative 1 (No Action)

	High Recruitment				Medium Recruitment				Deterministic Equilibrium Yield			
	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20
1998/99 - 2013/14												

Preferred Alternative 2

	High Recruitment				Medium Recruitment				Deterministic Equilibrium Yield			
	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20
1998/99 - 2008/09												
2009/10		■	■	■		■	■	■	■	■	■	■
2010/11	■	■	■	■	■	■	■	■	■	■	■	■
2011/12												
2012/13												
2013/14												

Alternative 3

	High Recruitment				Medium Recruitment				Deterministic Equilibrium Yield			
	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20
1998/99 - 2007/08												
2008/09								■				
2009/10		■	■	■		■	■	■	■	■	■	■
2010/11	■	■	■	■	■	■	■	■	■	■	■	■
2011/12												
2012/13												
2013/14												

Alternative 4

	High Recruitment				Medium Recruitment				Deterministic Equilibrium Yield			
	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20	2016/17	2017/18	2018/19	2019/20
1998/99 - 2003/04												
2004/05								■				■
2005/06												
2006/07				■			■	■				■
2007/08												
2008/09			■	■		■	■	■			■	■
2009/10	■		■	■	■	■	■	■	■	■	■	■
2010/11	■	■	■	■	■	■	■	■	■	■	■	■
2011/12												
2012/13												
2013/14												

In terms of economic effects, the alternatives that have the lowest probability of a first season closure would be the most positive for fishermen. If the first season reaches its quota, fishing would be stopped. However, since the 1998/1999 fishing year, no fishing year would have achieved the second season quota without needing any remaining fish from the first season. While the average year is not expected to result in season closures, there are some years where first season closures could happen. A first season closure could result in direct economic loss to fishermen. Therefore, not having any split seasons (**Alternative 1**) would increase the likelihood that commercial harvest for Atlantic king mackerel would not close until the entire Atlantic Southern Zone quota is caught. However, how early in the fishing season the entire ACL is caught could result in lower direct positive economic effects given that the Christian season of Lent, the forty days prior to Easter, when prices are highest for king mackerel usually begins in February. Whether or not an early closure from **Alternative 1** would have a more detrimental economic effect depends on how much of the ACL would not be caught under the split season alternatives. While prices are highest for king mackerel during Lent, the ex-vessel value of fish from the ACL that remained uncaught could pose a greater negative economic effect. In order of

likelihood of most positive direct economic effect to least positive are **Alternative 1** (No Action), **Preferred Alternative 2**, **Alternative 3**, and then **Alternative 4**.

4.4.3 Direct and Indirect Effects on the Social Environment

The social effects of commercial split seasons would likely be associated with the economic effects, and also would depend on how the accessible quota compares to current landings levels for individual fishermen and communities. The effects on the commercial fleet due to establishing split seasons (**Alternatives 2 (Preferred) – 4**) would depend on the Atlantic Southern Zone quota (designated in Action 2-1) and the rate of harvest during different times of the year. The overall negative effect on commercial fishermen and associated communities and businesses on the Florida east coast would depend on any restricted access to king mackerel due to early closures, and on if there is continued or increased effort from fishermen traveling from the Florida east coast to the Gulf commercial zones. The potential effects of traveling fishermen is discussed in more detail below.

One concern of commercial split seasons is that the quota is further allocated into smaller portions assigned to a specific time of year, which could generate derby conditions. In addition to concerns about safety at sea that arise from the race to fish, a derby could result in a large amount of king mackerel on the market in a very short period of time. This may cause reduced market value and lower product quality, and the bust-and-boom nature of the king mackerel commercial sector may hinder business stability and steady job opportunities for captain and crew.

Commercial split seasons for the Atlantic Southern Zone are similar to the current management system in which vessels on the Florida east coast (90-95% of the Atlantic Southern Zone landings) fish under the Atlantic Southern Zone quota from April 1 through October 31, and then under the Gulf Florida East Coast Subzone quota from November 1 through March 31. This system mirrors a split season quota system, as proposed in **Alternatives 2** (**Preferred**) – **4**. The Councils have received public comments and Gulf AP recommendations that the current system results in many vessels from the Florida east coast traveling to the Gulf, and have negative effects on the availability of quota to Gulf fishermen who fish in the Gulf Western, Northern and Southern Zones. Data obtained from the Southeast Fisheries Science Center (SEFSC) logbook program show that (as of February 2016) of the 531 vessels with commercial king mackerel permits that are homeported on the Florida east coast[4], 106 vessels have king mackerel catch from at least one Gulf zone between 2004 and 2015. The logbook data indicate that there is a core group of about 10-15 fishermen who travel between the Florida east coast and the Gulf Western and Northern Zones almost every year, but there have been more Florida east coast vessels with king mackerel catch in recent years (Table 4.4.3.1).

[4] Permit data with homeport information are available online at: http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/freedom_of_information_act/common_foia/index.html

Table 4.4.3.1. Number of Florida east coast vessels with king mackerel catch from at least one of the Gulf zones from 2004-2015. Source: SERO Permits Database, February 2016

Year	Number of FLEC vessels in the Gulf Western, Northern &/or Southern Zones
2004	11
2005	16
2006	16
2007	20
2008	18
2009	21
2010	30
2011	41
2012	50
2013	46
2014	37
2015	40

Additionally, data suggest that when landings of Atlantic king mackerel decrease, the number of fishermen traveling from the Florida east coast to at least one of the Gulf zones increases (Figure 4.4.3.1). The relationship between annual landings for the Gulf Florida East Coast Subzone and number of traveling vessels also indicates that as landings decrease, the number of traveling vessels may increase (Figure 4.4.3.2).

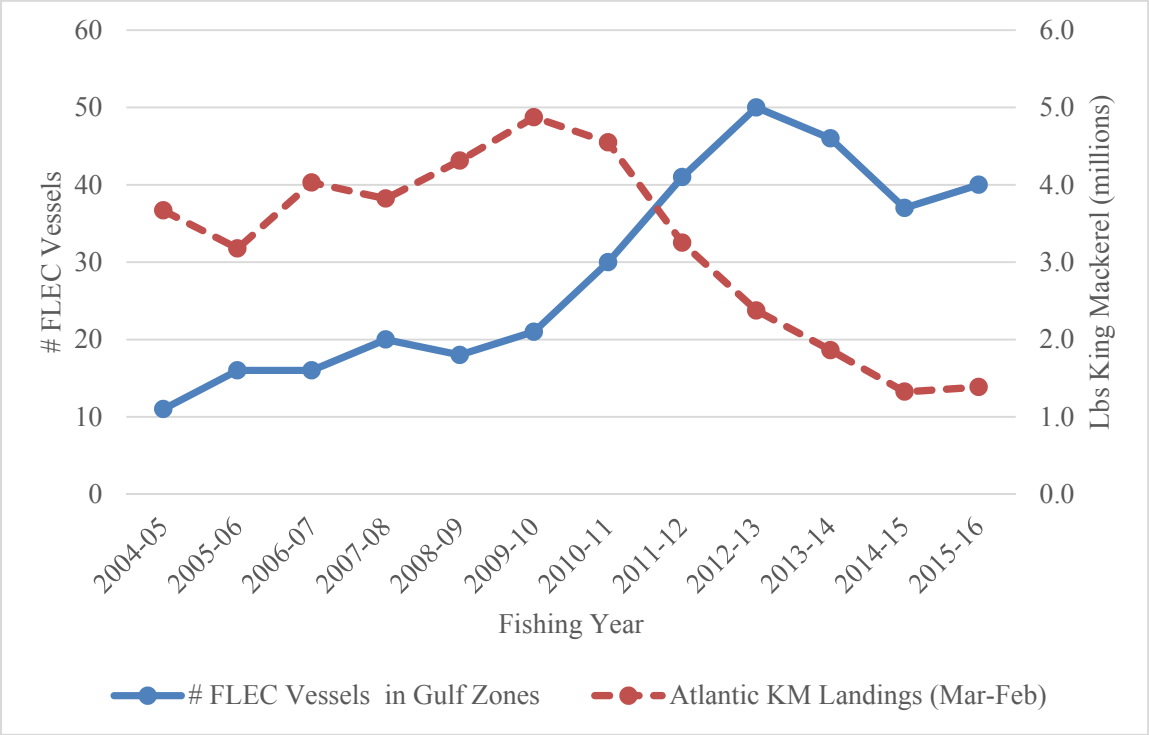

Figure 4.4.3.1. Number of Florida East Coast vessels (blue) with king mackerel catch from the Gulf Western Zone each fishing year, compared to commercial landings of Atlantic king mackerel (dashed red).

Source: SEFSC Commercial Logbook

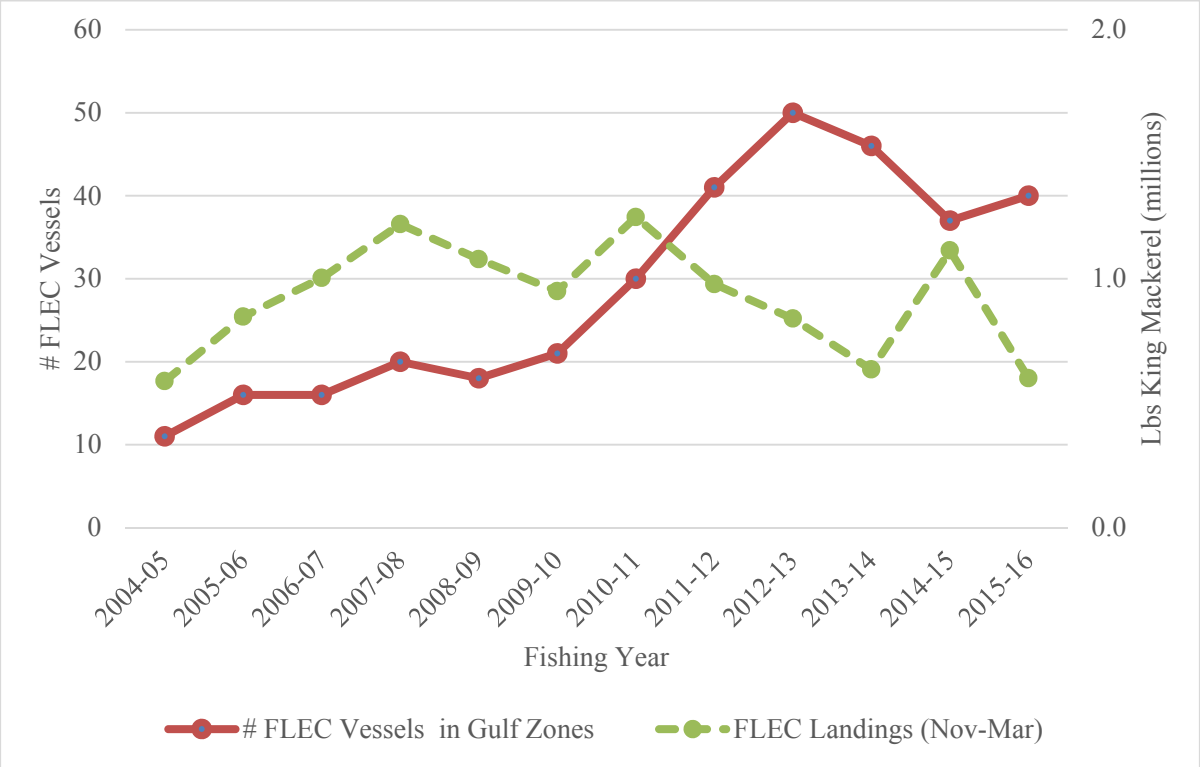

Figure 4.4.3.2. Number of Florida East Coast vessels (dotted green) with king mackerel catch from the Gulf Western Zone each fishing year, compared to commercial landings of king mackerel from the Florida East Coast Subzone from November – March (red).
Source: SEFSC Commercial Logbook

A split season under **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** would likely be beneficial to commercial fishermen harvesting king mackerel in the EEZ off the Florida east coast, because the majority of king mackerel landings for the Atlantic Southern Zone come from this area. Additionally, as shown in Table 2.4.1, there are two peak periods for king mackerel in the Southern Zone; one around April through June, and another around November through February. When compared to **Alternative 1** (No Action), social benefits for the Florida east coast fleet are expected from **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** because these would ensure available quota in the later months of the fishing year, regardless of fishing activity in earlier months of the fishing year.

The split season quotas proposed in **Preferred Alternative 2**, **Alternative 3**, and **Alternative 4** may result in negative effects on Gulf fishermen, because the number of Florida east coast vessels that travel to the Gulf may continue or increase if there is an in-season closure during one of the seasons. Because a period of high landing (such as in the 2009/10 fishing year) would likely cause an early closure in season 1 (see Section 4.4.1), there may be more Florida east coast vessels that would travel to the Gulf in the late summer and fall. However, the Councils have selected the highest possible ACLs for Atlantic king mackerel under Action 2-2, which will likely reduce the chance of an early closure in season 1 due to harvest reaching the season 1 quota.

Depending on the Atlantic Southern Zone quota that results from the Atlantic king mackerel ACL selected in Action 2-2, each alternative could result in an in-season closure, particularly if there is a period of high landings (Table 4.4.1.1). This could have negative effects on dealers and associated businesses that depend on Atlantic king mackerel availability during Lent, which is a time of high demand.

4.4.4 Direct and Indirect Effects on the Administrative Environment

The alternatives in this action are expected to have nominal differences in the direct and indirect effects on the administrative environment. **Alternative 1** (No Action) would have fewer administrative impacts than **Alternatives 2 (Preferred)**, **Alternative 3**, and **Alternative 4** because only one quota would need to be monitored, versus two quotas for split seasons. Relative to **Alternative 1** (No Action), **Alternative 2 (Preferred), Alternative 3** and **Alternative 4** would increase the administrative impacts in the form of rulemaking, outreach, education, monitoring, and enforcement. However, these impacts are not expected to be significant, as the infrastructure necessary to monitor quotas, announce in-season closures and address carry over quota to the next season already exists.

4.5 Action 5 – Establish a trip limit system for the Atlantic Southern Zone

Alternative 1: No action. The trip limits for the Atlantic Southern Zone will remain:

North of the Flagler/ Volusia county line, the trip limit is 3,500 lbs year-round.

In the area between the Flagler/ Volusia county line and the Volusia/Brevard county line, the trip limit is 3,500 lbs from April 1 through October 31.

In the area from the Volusia/Brevard county line to the Miami-Dade/Monroe county line, the trip limit is 75 fish from April 1 through October 31.

From November 1 through March 31, no trip limit is in place for the area between the Flagler/Volusia county line to the Dade/Monroe county line.

Alternative 2: In the Atlantic Southern Zone, the trip limit north of the Flagler/Volusia county line is 3,500 lbs. For the area south of the Flagler/Volusia county line, establish a year-round trip limit of 75 fish for Atlantic king mackerel.

Preferred Alternative 3: In the Atlantic Southern Zone, the trip limit north of the Flagler/Volusia county line is 3,500 lbs. For the area south of the Flagler/Volusia county line, establish a trip limit of 50 fish from March 1- March 31, and 75 fish for the remainder of season 1 (as designated in Action 4).

> **Option 3a:** Beginning on August 1 and continuing through the end of season 1, if 75% of the season 1 quota has been taken, the trip limit will be 50 fish.
> **Preferred Option 3b:** At any time during season 1, if 75% of the season 1 quota has been taken, the trip limit will be 50 fish.

Preferred Alternative 4: In the Atlantic Southern Zone, the trip limit north of the Flagler/Volusia county line is 3,500 lbs. For the area south of the Flagler/Volusia county line, establish a trip limit of 50 fish for season 2 (as designated in Action 4).

> **Preferred Option 4a:** Beginning on February 1 and continuing through the end of February–
> (1) If 70 % or more of the season 2 quota has been taken, the trip limit is 50 fish.
> (2) If less than 70 % of the season 2 quota has been taken, the trip limit is 75 fish.
> **Option 4b:** Beginning on January 1 and continuing through the end of February–
> (1) If 70 % or more of the season 2 quota has been taken, the trip limit is 50 fish.
> (2) If less than 70 % of the season 2 quota has been taken, the trip limit is 75 fish.
> **Option 4c:** Beginning on February 1 and continuing through the end of February–
> (1) If 80 % or more of the season 2 quota has been taken, the trip limit is 50 fish.
> (2) If less than 80 % of the season 2 quota has been taken, the trip limit is 75 fish.

4.5.1 Direct and Indirect Effects on the Physical and Biological Environments

This action has alternatives for trip limits in numbers of fish; however, the commercial trip level data (logbook data) has the landings reported in pounds. See Appendix G for an explanation of how the conversion was done.

As in Actions 2 and 4, this analysis compares potential outcomes based on a high, medium, and low quotas (which encompass the range of all potential ACLs/quotas) and considers how the potential trip limits would work during periods of maximum landings (using 2009/2010 landings), minimum landings (using 2013/2014 landings), and average landings (average of 2009/2010 through 2013/2014) scenarios.

Alternative 2 would impose a year-round trip limit of 75 fish for the area south of the Flagler/Volusia county line. This alternative would reduce the trip limit from 3,500 lbs ww (current trip limit, **Alternative 1**) down to 75 fish from April 1 through October 31 in the waters off Volusia County. **Alternative 2** would also impose a 75 fish trip limit from Volusia through Dade County from November 1 through March 31. This region already has a 75 fish trip limit from April 1 through October 31 (**Alternative 1**).

Table 4.5.1.1 summarizes the predicted closure dates under **Alternative 2** based on the maximum landings scenario. The minimum landings and average landings scenarios did not result in any predicted closure dates under any of the alternatives in Action 5.

Table 4.5.1.1. Predicted closure dates for commercial season alternatives under Action 4 with the 75 fish trip limit in Alternative 2. The closure dates were predicted for the Atlantic migratory group in the Southern Zone using the landings from 2009/2010 (maximum landings scenario). Cells with closure dates were highlighted in yellow.

	Action 4 Alternative						
	1	2		3		4	
	Mar-Feb	Mar –Sep 60%	Oct-Feb 40%	Mar-Oct 60%	Nov-Feb 40%	Mar-Sep 50%	Oct-Feb 50%
High Quota	5,002,400	3,001,440	2,000,960	3,001,440	2,000,960	2,501,200	2,501,200
Closure Date	No Closure	No Closure	No Closure	No Closure	No Closure	28-Aug	No Closure
Medium Quota	3,694,080	2,216,448	1,477,632	2,216,448	1,477,632	1,847,040	1,847,040
Closure Date	23-Jan	13-Aug	No Closure	13-Aug	No Closure	18-Jul	No Closure
Low Quota	3,001,440	1,800,864	1,200,576	1,800,864	1,200,576	1,500,720	1,500,720
Closure Date	4-Dec	14-Jul	No Closure	14-Jul	No Closure	20-Jun	No Closure

The predicted closure dates from Table 4.4.1.1 (from previous section) and Table 4.5.1.1 are very similar. **Alternative 2** only applies to landings off Volusia through Dade County and there

are more landings in the Atlantic Southern Zone that would not be impacted by the trip limit proposed in **Alternative 2**. Additionally, the percent reductions for the 75 fish trip limit were only applied to the waters off Volusia county from April to October because this region already has a 75 fish trip limit in the other months of the year. Also, the percent reductions for the 75 fish trip limit were only applied to waters off of Volusia through Dade County during November to March because this region already has a 75 fish trip limit in the other months of the year.

Preferred Alternative 3 proposes a 50 fish trip limit for the area south of the Flagler/Volusia county line for the month of March and then a trip limit of 75 fish for the rest of season 1. The alternative also has options to decrease the trip limit to 50 fish if 75% of the ACL is met in season 1. Under **Option 3a**, the reduced trip limit of 50 fish is imposed after August 1 if 75% of the ACL is met. Under **Preferred Option 3b**, the reduced trip limit of 50 fish is imposed any time during season 1 when 75% of the ACL is met. Table 4.5.1.2 provides the dates when 75% of the ACL is predicted to be met, and also predicted closure dates under **Option 3a** and **Preferred Option 3b**.

Table 4.5.1.2. Predicted closure dates for commercial season alternatives for Action 4 with the trip limit options stated in Alternative 3 of Action 5. This alternative only proposes trip limits for season 1. The closure dates were predicted for the Atlantic migratory group in the Atlantic Southern Zone using the landings from 2009/2010. The closure dates are based on the high, medium and low commercial quotas of 5,002,400 lbs ww, 3,694,080 lbs ww, and 3,001,440 lbs ww respectively. Cells with closure dates were highlighted in yellow.

	Action 4 Alternatives			
	1	2	3	4
	Mar-Feb	Mar-Sep 60%	Mar-Oct 60%	Mar-Sep 50%
Season 1 – *High* Quota	5,002,400	3,001,440	3,001,440	2,501,200
75% of Quota	3,751,800	2,251,080	2,251,080	1,875,900
Predicted Date to Reach 75% of Quota	12-Jan	5-Aug	5-Aug	6-Jul
Option 3a Closure Date	No Closure	No Closure	No Closure	22-Aug
Option 3b Closure Date	No Closure	No Closure	No Closure	24-Aug
Season - *Medium* Quota	3,694,080	2,216,448	2,216,448	1,847,040
75% of Quota	2,770,560	1,662,336	1,662,336	1,385,280
Predicted Date to Reach 75% of Quota	10-Sep	19-Jun	19-Jun	30-May
Option 3a Closure Date	18-Jan	4-Aug	4-Aug	3-Jul
Option 3b Closure Date	18-Jan	10-Aug	10-Aug	29-Jul
Season 1- *Low* Quota	3,001,440	1,800,864	1,800,864	1,500,720
75% of Quota	2,251,080	1,350,648	1,350,648	1,125,540
Predicted Date to Reach 75% of Quota	5-Aug	29-May	29-May	21-May
Option 3a Closure Date	2-Dec	29-Jun	29-Jun	7-Jun
Option 3b Closure Date	2-Dec	24-Jul	24-Jul	25-Jun

Under Action 2-2/ Preferred Alternative 3**;** Action 4/ Preferred Alternative 2 and Action 5/ **Preferred Alternative 3** with **Option 3a**, the commercial harvest for Atlantic group king mackerel would be expected to close before August 4 because the quota specified in Action 2-2/

Preferred Alternative 3 is slightly lower than that analyzed in the medium quota scenario. If the Councils select Action 2-2/ Preferred Alternative 3**;** Action 4/ Preferred Alternative 2 and Action 5/ **Preferred Alternative 3** with **Preferred Option 3b**, the commercial harvest for Atlantic group king mackerel would be expected to close on or before August 10. Under these actions, the closure would only apply to season 1 (March-September) and regardless of which option they choose under **Preferred Alternative 3** the closure date will only differ by a couple of days.

Preferred Alternative 4 would only implement trip limits for season 2 (if established under Action 4). The landings scenarios for season 2 would be less than the quotas analyzed in the high, medium, and low quota scenarios and as such, no closure dates would be expected in season 2, with or without trip limits.

Establishing commercial trip limits would not be expected to have any impact on essential fish habitat (EFH), habitat areas of particular concern (HAPCs), or protected species. In a 2015 biological opinion, NMFS determined the gillnet gear used in the federal CMP fisheries of the Atlantic and Gulf may have adversely affected sea turtles, smalltooth sawfish, and Atlantic sturgeon in the past via entanglement and, in the case of sea turtles, via forced submergence. Commercial and recreational hook-and-line gear and commercial cast net gear are not likely adversely affected these species. The biological opinion provides an incidental take statement for species, which may interact with CMP fisheries.

The biological effects of all alternatives in Action 5 would largely be expected to be neutral because ACLs are in place to prevent overharvesting, and AMs are in place to take action if ACLs are exceeded. Trip limits would slow the rate of harvest within the Atlantic Southern Zone and may reduce the amount of regulatory discards associated with the Atlantic group king mackerel. Regulatory discards may increase if the fishing season closes early, constituting a negative biological effect.

4.5.2 Direct and Indirect Effects on the Economic Environment

Trip limits, especially those that restrict a larger number of trips, can introduce economic inefficiencies by increasing trip costs to harvest the same overall poundage of fish. Particularly successful trips might have to end earlier than they otherwise would because the trip limit would have been reached.

A potentially positive aspect of trip limits could be that the season would stay open longer; reducing catches while fish are spawning; and/or reduce the amount of dead discards that could occur after a closure. Dead discards are fish that cannot otherwise be sold and, depending on the amount of dead discards, could have an effect on future stock status, as well as reduce trip direct positive economic effects.

The analysis for Action 5 depends on the preferred alternatives for Action 2 and Action 4. Table 4.5.2.1 shows the differences in expected ex-vessel value compared to **Alternative 1** (No Action) for king mackerel for each of the Action 4 scenarios and the three Action 2 quota options based on 2009/2010 maximum landings scenario. To determine the differences in expected ex-vessel value for Action 4/Alternatives 2 – 4, the ex-vessel values of both sub-seasons were added. Expected landings and corresponding ex-vessel values vary depending on the months and

the percent of landings included in each sub-season. Under the Action 2 high quota alternative, Action 5/**Alternatives 1 – 3 (Preferred)** have the same overall expected ex-vessel value, which is higher than **Preferred Alternative 4**. For the Action 2 medium and low quota alternatives, Action 5 **Alternative 1** is expected to have the highest direct positive economic effects, followed by **Alternative 2**, and **Preferred Alternative 3**. **Preferred Alternative 4** is expected to have the lowest direct positive economic effect.

Table 4.5.2.1. Differences in expected ex-vessel value (in 2014 dollars) compared to Alternative 1 (No Action) for king mackerel from the Southern Zone based on the alternative combinations of Actions 2 and 4, plus Options from Action 5, Alternative 2, based on 2009/2010 maximum landings scenario.

	Action 4 Alternatives			
	1	2	3	4
High Quota	5,002,400	5,002,400	5,002,400	5,002,400
Pounds Landed	3,802,888	3,802,888	3,802,888	3,600,260
Ex-vessel Value	$10,914,289	$0	$0	($581,543)
Medium Quota	3,694,080	3,694,080	3,694,080	3,694,080
Pounds Landed	3,694,080	3,315,508	3,257,186	2,946,100
Ex-vessel Value	$10,602,010	($1,086,502)	($1,253,886)	($2,146,703)
Low Quota	3,001,440	3,001,440	3,001,440	3,001,440
Pounds Landed	3,001,440	2,899,924	2,841,602	2,599,780
Ex-vessel Value	$8,614,133	($291,352)	($458,735)	($1,152,765)

Table 4.5.2.2 shows the estimated economic ex-vessel value (in 2014 dollars) for king mackerel taking into account the various possible combinations of Actions 2 and 4 for **Preferred Alternative 3** in Action 5. Table 4.5.2.2 is based on the estimated closure dates shown in Table 4.5.1.1. Where an in-season closure was projected, it was assumed that the entire Atlantic Southern Zone quota would be caught. Where no seasonal closure was expected, the number of pounds that was expected to be caught during the season was used to calculate expected ex-vessel value. Action 4 proposes to separate the king mackerel season into two seasons, each alternative accounting for a different length for the first season, as well as the percent of the ACL that would be in each season. Therefore, comparisons across the different alternatives from Action 4 should not be considered. **Alternative 3** adds a second temporal component to the analysis that determines when the trip limits change. Comparisons of economic effects in the same column shown in Table 4.5.2.2 are comparable based on the ACLs determined by the different quota options from Action 2. Within each of the Action 4 alternatives, the high quota option is expected to have the greatest direct, positive economic effect, followed by the medium quota option, and lastly by the low quota option.

Table 4.5.2.2. Ex-vessel value (in 2014 dollars) for king mackerel from the Atlantic Southern Zone based on the alternative combinations of Actions 2 and 4, plus options from Action 5 Preferred Alternative 3, based on 2009/2010 maximum landings scenario.

Action 4 Alternatives			
1	**Preferred 2**	3	4

	Mar-Feb	**Mar-Sep 60%**	Mar-Oct 60%	Mar-Sep 50%
HIGH Quota Lbs	5,002,400	3,001,440	3,001,440	2,501,200
Option 3a Ex-vessel Value	$10,773,859	$7,442,960	$7,586,472	$7,178,444
Option 3b Ex-vessel Value	$10,773,859	**$7,442,960**	$7,586,472	$7,178,444
MEDIUM Quota Lbs	3,694,080	2,216,448	2,216,448	1,847,040
Option 3a Ex-vessel Value	$10,445,818	$6,361,206	$6,361,206	$5,301,005
Option 3b Ex-vessel Value	$10,445,818	$6,361,206	$6,361,206	$5,301,005
LOW Quota Lbs	3,001,440	1,800,864	1,800,864	1,500,720
Option 3a Ex-vessel Value	$8,614,133	$5,168,480	$5,168,480	$4,307,066
Option 3b Ex-vessel Value	$8,614,133	$5,168,480	$5,168,480	$4,307,066

Table 4.5.2.3 shows the same information as Table 4.5.2.2 except it has the expected ex-vessel values (in 2014 dollars) for **Preferred Alternative 4** in this action. In Section 4.5.1.1 of this document, it was estimated that regardless of the ACL level (high, medium, or low) chosen, the entire Atlantic Southern Zone quota would not be caught under any of the Action 5 options, except in some cases under Action 4/Alternative 1 where there would be no split season. Therefore, the number of pounds expected to be caught during the season was used to calculate expected ex-vessel value. Action 4 proposes to separate the king mackerel season into two seasons, with each alternative accounting for a different length for the second season, as well as the percent of the ACL that would be allocated in each season. Therefore, comparisons across the different alternatives from Action 4 should not be considered. **Alternative 4** adds a second temporal component (and different trip limits) to the analysis that determines when the trip limits change. Comparisons of economic effects in the same column shown in Table 4.5.2.3 are comparable based on the ACLs determined by the different quota options from Action 2. Within each of the Action 4 alternatives, the high quota option is expected to have the greatest direct positive economic effect, followed by the medium quota option, and lastly by the low quota option; however, the amount of the expected differences between options is less than $2,000.

Table 4.5.2.3. Expected ex-vessel value (in 2014 dollars) for king mackerel from the Atlantic Southern Zone based on the alternative combinations of Actions 2 and 4, plus Options from Action 5, Preferred Alternative 4, based on 2009/2010 maximum landings scenario.

Alternative 4 of Action 5 Options	Action 4 Alternatives			
	1	**Preferred 2**	3	4
	Mar-Feb	**Mar-Sep 60%/Oct-Feb 40%**	Mar-Oct 60%/Nov-Feb 40%	Oct-Feb 50%
HIGH Quota	5,002,400 lbs	2,000,960 lbs	2,000,960 lbs	2,501,200 lbs
Option 4a Ex-vessel Value	$9,418,765	**$3,154,302**	$2,986,918	$3,154,302
Option 4b Ex-vessel Value	$10,783,196	$3,154,302	$2,986,918	$3,154,302
Option 4c Ex-vessel Value	$10,914,288	$3,154,302	$2,986,918	$3,154,302
MEDIUM Quota	3,694,080 lbs	2,216,448 lbs	2,216,448 lbs	1,847,040 lbs
Option 4a Ex-vessel Value	$9,418,765	$3,153,092	$2,986,918	$3,154,302
Option 4b Ex-vessel Value	$10,602,010	$3,023,209	$2,986,918	$3,154,302
Option 4c Ex-vessel Value	$10,602,010	$3,154,302	$2,986,918	$3,154,302
LOW Quota	3,001,440 lbs	1,800,864 lbs	1,800,864 lbs	1,500,720 lbs
Option 4a Ex-vessel Value	$8,614,133	$3,153,092	$2,985,708	$3,153,092
Option 4b Ex-vessel Value	$8,614,133	$3,023,209	$2,986,918	$3,154,302
Option 4c Ex-vessel Value	$8,614,133	$3,153,092	$2,985,708	$3,154,302

It was previously noted that the expected ex-vessel value of each of the Action 5 alternatives is influenced by the various alternatives of Actions 2 and 4. The alternatives for this action can be summarized overall by removing the effects of Actions 2 and 4. In order from least to most direct positive economic effect would be **Preferred Alternative 4/Preferred Option 4a**, **Preferred Alternative 3/Preferred Option 3a** and **Option 3b**, **Preferred Alternative 4/Option 4b**, **Alternative 2** or **Preferred Alternative 4/Option 4c** and the highest direct positive economic effect would be from either.

4.5.3 Direct and Indirect Effects on the Social Environment

Alternative 1 (No Action) would not establish a trip limit for the Atlantic Southern Zone in the winter months (November through February), which could result in a shorter season if the rate of harvest increases without trip limits. The 75-fish per vessel trip limit in **Alternative 2** and **Preferred Alternative 3** would be expected to benefit fishermen by maintaining a similar trip limit as the current trip limit, and to help lengthen the season. However, as discussed in Section 4.5.1, under most possible season 1 quotas when compared to landings in many of the past several fishing years, there will likely not be an early closure. The step-down in **Preferred Alternative 3** would likely help decrease the likelihood of an in-season closure, but only in years when landings are higher than normal (such as the 2009/2010 fishing year). Implementing the step-down when 75% of the season 1 quota has been met after a specific date (**Option 3b**) instead of at any time during the season 1 (**Preferred Option 3a**) may delay any benefits of

lengthening the season, if the step-down is not implemented early enough to slow the rate of harvest.

Similarly, the trip limit, and potential step-up in the trip limit, proposed in **Preferred Alternative 4** and its options would likely be beneficial to the commercial fleet in the Atlantic Southern Zone and help to maintain access to the resource at a similar level as under the current trip limit system. As discussed in Section 4.5.1, it is likely that the step-up in the trip limit would not result in an early closure under any potential ACLs/quotas. **Preferred Option 4a** would be the most similar to the current system and would not result in negative effects on the fleet due to new regulations. **Option 4b** would allow the step-up to occur for a longer period (two months) than **Preferred Option 4a**, which could be beneficial to vessels, but may result in large quantities of fish flooding the market for those months. **Option 4c** would also allow the step-up to occur at a higher percentage of the ACL (80%), but could result in some vessels missing fishing opportunities if the step-up was not implemented with enough time to maximize landings.

4.5.4 Direct and Indirect Effects on the Administrative Environment

Alternative 2 would simplify the trip limit regulations compared to the status quo (**Alternative 1**) and the trip limits proposed in **Preferred Alternative 3** and **Preferred Alternative 4**, and associated sub-options. Of the proposed alternatives, **Alternative 2** would be the least administratively burdensome in that it proposes a year round trip limit both north and south of the Flagler/Volusia county line. Given that the trip limit does not change throughout the year and there is no step down related to the quota, administrative impacts would be minimized. Neither **Preferred Alternative 3** nor **Preferred Alternative 4**, and associated sub-options is more administratively burdensome than the other. Both **Preferred Alternative 3** and **Preferred Alternative 4**, and associated sub-options would reduce the trip limit once a specified level of harvest is reached (either in season 1 or season 2). This step down trip limit adds a layer of administrative burden associated with monitoring the quota that is not in **Alternative 1** or **Alternative 2**. The administrative impacts associated with the alternatives would be associated with rulemaking, outreach, and enforcement.

4.6 Action 6. Modify the ACL for Gulf Migratory Group King Mackerel

Alternative 1: No action – Do not modify the ACL for Gulf migratory group king mackerel. The ACL of 10.8 million pounds will remain.

Preferred Alternative 2: Set the Gulf migratory group king mackerel ACL equal to the ABC recommended by the Gulf Scientific and Statistical Committee for 2015-2019. ABC values are in millions of pounds:

Year	ABC (mp)
2015	9.62
2016	9.21
2017	8.88
2018	8.71
2019	8.55

Alternative 3: Establish a constant catch scenario for the Gulf migratory group king mackerel ACL for one of the following time periods. The ACL during the selected time period may not exceed the ABC recommended by the Gulf SSC for any year during the selected time period.

Option a: A three-year period (2015-2017)
Option b: A five-year period (2015-2019)

Note: Landings are reported in mixed whole and gutted weights. Therefore, ACLs and quotas will also be in mixed weights consistent with current regulations.

4.6.1 Direct and Indirect Effects on the Physical and Biological Environments

King mackerel are usually caught at the ocean surface and therefore neither hook-and-line nor run-around gillnet gear typically come in contact with bottom habitat. However, these gear types have the potential to snag and entangle bottom structures and cause tear-offs or abrasions (Barnette 2001). If gear is lost or improperly disposed of, it can entangle marine life. Entangled gear often becomes fouled with algal growth. If fouled gear becomes entangled on corals, the algae may eventually overgrow and kill the coral.

Management actions that affect the biological environment mostly relate to the impacts of fishing on a species' population size, life history, and the role of the species within its habitat. Removal of fish from the population through fishing can reduce the overall population size if harvest is not maintained at sustainable levels. Indirect impacts of these alternatives on the biological environment would depend on the resulting reduction or increases in the level of fishing as a result of each alternative. A recent biological opinion released by the NMFS (2015) indicated that the continued operation of the hook-and-line components of the CMP fishery are not likely to adversely affect protected species; however, the operation of the gillnet component will adversely affect some species of turtles and sharks. See Section 3.3.1 for more information.

The status quo (**Alternative 1**) represents a harvest scenario where the recreational sector does not typically catch its ACL, while the commercial sector does. It is this scenario upon which the other alternatives in Action 6 will be compared for physical and biological effects.

Alternative 1 would set an ACL equal to the current ACL of 10.8 mp for Gulf king mackerel. This alternative does not consider the results of the most recent stock assessment (SEDAR 38 2014), which recommended changes in stock boundaries and harvest levels. Therefore, **Alternative 1** does not include the most recent scientific information that considers a smaller area for the Gulf migratory group. Continuing to harvest king mackerel from the Gulf migratory group at the levels described in **Alternative 1** could result in harvest levels above those recommended by the stock assessment (SEDAR 38 2014) and the ABC projections recommended by the Gulf Council's SSC.

Preferred Alternative 2 would set ACL equal to the ABC from SEDAR 38. Based on the present level of recreational fishing effort for Gulf migratory group king mackerel, it is highly unlikely that the stock ACL would be met. From a sector-specific standpoint, a recreational ACL would not likely be reached; on the other hand, the commercial sector has typically caught its ACL (Table 2.8.2). Therefore, under **Preferred Alternative 2**, the physical and biological effects are not expected to differ from the status quo. **Preferred Alternative 2** represents the greatest risk with respect to exceeding the ABC, since no buffer is proposed to separate the ABC and the ACL. The Councils have not proposed a buffer for Gulf king mackerel because the stock is not overfished or undergoing overfishing (SEDAR 38 2014).

Alternative 3 would establish a constant catch scenario for the recreational and commercial sectors. Fishermen have remarked that constant catch scenarios add a degree of predictability to when seasons might close. Since the recreational sector in the Gulf has not experienced a seasonal closure for king mackerel in over a decade due to landings well below the recreational ACL, a constant catch scenario is not likely to change angler behavior such that a change in effort is also likely. The commercial sector typically harvests its ACL every year. A constant catch scenario may help commercial fishermen better manage when and how they fish; however, since the commercial sector is expected to harvest its ACL regardless of which alternative is chosen in Action 6, the physical and biological effects of **Alternative 3** are expected to be similar to those in **Preferred Alternative 2**. A constant catch scenario is contingent upon known sector allocations. Since these allocations were being reconsidered in this amendment (see Action 8), an analysis of **Options a** and **b** in **Alternative 3** was not possible. See Council Conclusions in Section 2.6 for the rationale behind the absence of the analysis of effects for **Alternative 3**.

None of the alternatives are likely to trigger accountability measures (AMs) for the recreational sector because the recreational catches have been well below their ACL (Table 2.8.1). However, the commercial sector typically has harvested its ACL prior to the end of the season (Table 2.8.1), and may continue to do so under any of the management options presented in Action 6. All options for Action 6 are presented in Table 4.6.1.1. Landings are in millions of pounds.

Table 4.6.1.1. Quotas for commercial Gulf king mackerel under the alternatives presented in Action 5 (in mp).

Option	Year	Commercial ACL	Recreational ACL	Total ACL
Alt 1	2015	3.456	7.344	10.8
	2016	3.456	7.344	10.8
	2017	3.456	7.344	10.8
	2018	3.456	7.344	10.8
	2019	3.456	7.344	10.8
Alt 2 (Preferred)	2015	3.078	6.542	9.62
	2016	2.947	6.263	9.21
	2017	2.842	6.038	8.88
	2018	2.787	5.923	8.71
	2019	2.736	5.814	8.55
Alt 3, Opt a	2015	**Dependent on the allocation scenario chosen in Action 8**		
	2016			
	2017			
Alt 3, Opt b	2015			
	2016			
	2017			
	2018			
	2019			

4.6.2 Direct and Indirect Effects on the Economic Environment

Alternative 1 would maintain a 10.8 mp ACL for Gulf king mackerel and would not be expected to affect harvests and other customary uses of Gulf king mackerel. Therefore, **Alternative 1** would not be expected to result in economic effects.

Between 2015 and 2019, the ACLs for Gulf king mackerel proposed in **Preferred Alternative 2** range from 9.62 to 8.55 mp. It is noted that the ACLs that would be set under **Alternative 3** (**Options a** and **b**) are not known at this time but would fall within the range specified for **Preferred Alternative 2**. Relative to the no action ACL of 10.8 mp, the proposed ACLs could reduce the king mackerel ACL in the Gulf by as much as 20.8%. However, the 10.8 mp ACL in **Alternative 1** includes the Florida East Coast Subzone, which according to the most recent stock assessment, is no longer considered part of the Gulf migratory group (SEDAR 38 2014). Because of this, it is more appropriate to compare these alternatives under the assumption that the Florida East Coast Zone will not be considered in Gulf ACL determinations. During the last 15 years, Gulf king mackerel landings reached a maximum of 8.1 mp (Table 2.8.1). It is therefore not likely that the overall Gulf king mackerel ACL would be exceeded under any alternative. However, while the recreational harvests are well below the recreational ACL, commercial landings routinely meet and on a few instances exceed the commercial ACL. Therefore, economic effects would not be expected to result from proposed decreases in

recreational ACLs between 2015 and 2019. For the commercial sector, positive economic effects would be expected to result from increases in commercial ACLs. Table 4.6.2.1 provides status quo and proposed ACLs, increases in ACLs and in ex-vessel values between 2015 and 2019.

Table 4.6.2.1. Commercial Gulf king mackerel ACLs, decreases in ACLs and in ex-vessel values relative to status quo (2015-2019). ACLs are in millions of pounds. FLEC stands for the Florida East Coast Subzone.

Year	Commercial ACLs (mp)			Difference (Alternative 1 [less FLEC] and Alternative 2)	
	Alternative 1 (Status quo)	Alternative 1 (Less FLEC)	Alternative 2	Million Pounds	Ex-Vessel Value
2015	3.456	2.353	3.078	+ 0.725	+ $1,471,750
2016	3.456	2.353	2.947	+ 0.594	+ $1,205,820
2017	3.456	2.353	2.842	+ 0.489	+ $992,670
2018	3.456	2.353	2.787	+ 0.434	+ $881,020
2019	3.456	2.353	2.736	+ 0.383	+ $777,490

Ex-vessel values were calculated based on an ex-vessel price of $2.03 per pound derived from landings data available at http://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/annual-landings/index

It is assumed that the commercial sector would have landed annually the totality of its ACL under status quo, i.e., 3.456 mp (or 2.353 mp, which excludes the Florida East Coast Zone). It is also assumed that commercial fishermen would land the entirety of the proposed ACLs between 2015 and 2019. Based on these assumptions, annual Gulf king mackerel commercial landings would be expected to increase by an average of 0.525 mp under **Preferred Alternative 2**. The associated positive economic effects that would be expected to result from **Preferred Alternative 2** are estimated at approximately $1.06 million. Because options in **Alternative 3** would set constant catch ACLs within the range of ACLs considered in **Preferred Alternative 2**, economic benefits to the commercial sector expected to result from **Alternative 3** are expected to be at most, equal to the economic effects estimated under **Preferred Alternative 2**.

4.6.3 Direct and Indirect Effects on the Social Environment

Although additional effects would not be expected from retaining the current ACL of 10.8 mp under **Alternative 1** (No Action), the ACL must be modified to be consistent with the results of the stock assessment. These results include the identification of the new, smaller mixing zone as well as updated stock benchmarks and yield projections. The effects of this action assume that the Gulf Florida East Coast Zone would be removed by the Councils selecting Alternative 2 or 3 in Action 1.

In general, increasing an ACL would be expected to result in direct positive effects to the social environment by providing more fish for harvest, while direct negative effects would be expected from a decrease to an ACL, as less fish are available for harvest. The stock assessment allowed for the overall allowable catch for Gulf and Atlantic migratory groups of king mackerel to be increased, and identified a new management boundary between the migratory groups of king mackerel. This provides a smaller area for the Gulf migratory group ACL to be harvested than

the current Gulf commercial zones. Thus, although **Preferred Alternative 2** and **Alternative 3** provide lower ACLs than **Alternative 1**, the harvest area to which the new ACLs would be applied would also be smaller than at present. Further, Gulf migratory group king mackerel landings have not met the Gulf stock ACL in the last 15 years, meaning that fishing effort could increase somewhat and still remain below the ACL. For both of these reasons, either **Preferred Alternative 2** or **Alternative 3** would be expected to result in greater benefits compared with **Alternative 1**.

The difference between **Preferred Alternative 2** and **Alternative 3** that may affect the social environment pertains to a variable, decreasing ACL (**Preferred Alternative 2**), or a constant but lower annual ACL (**Alternative 3**). The Gulf migratory group ACL considered here will be divided between the commercial and recreational sectors. Generally, a constant ACL is assumed to entail more benefits compared to a variable ACL, as a constant ACL could allow for a consistent level of fishing effort and activity to occur from one year to the next. A constant catch ACL would be expected to provide more benefits to the recreational sector than the commercial sector. For the recreational sector, a constant catch scenario is more likely to provide a consistent fishing season length from one year to the next, and is preferred by charter operators and anglers who wish to plan their fishing activity. However, the recreational sector has a year-round fishing season for king mackerel and has caught an average of 38% of its quota over the last 10 years. Thus, even if the amount of fish allowed to be harvested increases, no additional benefits would be expected to result for the recreational sector, as these additional fish would not be caught under existing fishing activity. For the recreational sector, then, the effects of **Preferred Alternative 2** and **Alternative 3** would be expected to be similar.

The commercial sector has come close to meeting or has exceeded its sector ACL in recent years (Table 2.7.3), meaning that a proportional increase in the ACL would result in positive effects by providing more fish. When the commercial sector is projected to meet the ACL for a given zone, NMFS prohibits further harvest of king mackerel from that zone. Although the commercial sector has exceeded its sector ACL by as much as 11% in a single year, total landings have not exceeded 68% of the Gulf migratory group's ACL. Thus, the additional fish provided each year under **Preferred Alternative 2** would result in greater benefits for the commercial sector than the constant catch scenario of **Alternative 3**.

Options a and **b** under **Alternative 3** specify the time period for which the constant catch scenario would be in place. Because the allowable catch is the same for 2015 through 2017 under both **Options a** and **b** and the highest catch level is provided for 2016, there would be no difference in effects between the two options for these years. **Option b** would maintain the same allowable catch level that would be in place under **Option a** for an additional two years. However, these catch levels would not be feasible if an alternate allocation scenario is established, as is currently being evaluated in CMP Amendment 29.

4.6.4 Direct and Indirect Effects on the Administrative Environment

Changing the ACL through **Alternatives 2** or **3** would not increase the administrative burden over **Alternative 1**, since the NMFS would still be responsible for monitoring the sector ACLs. Other administrative burdens that may result from all of the alternatives considered would take

the form of development and dissemination of outreach and education materials for fishery participants.

4.7 Action 7. Revise the Commercial Zone Quotas for Gulf Migratory Group King Mackerel

Alternative 1: No action – Maintain the current commercial zone quotas for Gulf migratory group king mackerel (Western Zone: 31%; Northern Zone: 5.17%; Southern Zone Handline: 15.96%; Southern Zone Gillnet: 15.96%; Florida East Coast Zone: 31.91%).

Alternative 2: Revise the commercial zone quotas for Gulf migratory group king mackerel by dividing the Florida East Coast Zone's quota into four equal parts, to be added to each of the remaining Gulf commercial zones.

Alternative 3: Revise the commercial zone quotas for Gulf migratory group king mackerel by dividing each individual zone's quota percentage by the sum of the quota percentages for all Gulf commercial zones *except* the Florida East Coast Zone, with each resultant percentage becoming that respective zone's new commercial quota.

Preferred Alternative 4: Revise the commercial zone quotas for Gulf migratory group king mackerel as follows: 40% for the Western Zone; 18% for the Northern Zone; 21% for the Southern Zone Handline component; and 21% for the Southern Zone Gillnet component.

4.7.1 Direct and Indirect Effects on the Physical and Biological Environments

The capacity for the commercial sector in the Gulf to harvest its ACL has been well documented (Table 2.8.1). Changes in the ACL (as proposed in Action 6) are not expected to result in the commercial sector not being able to harvest its ACL. Further, the commercial king mackerel fishing zones in the Gulf have a history of closing prior to the end of the commercial king mackerel fishing season, especially for the last five years (Table 4.7.1.1). In some years, the rate at which commercial landings were being reported exceeded the speed with which trip limit reductions (eliminated in Amendment 20B to the CMP FMP: GMFMC and SAFMC 2014) could be issued and put into effect. During these years, commercial zone closures were issued without issuing trip limit reductions. However, the new requirement for dealer permits and electronic reporting should improve the timeliness of closures in the future.

Table 4.7.1.1. Closing dates for commercial king mackerel fishing zones in the Gulf. "TLR" = "trip limit reduction". "X" indicates no trip limit reduction or no closure.

		Years														
Zone		**2000-01**	**2001-02**	**2002-03**	**2003-04**	**2004-05**	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Western Zone	Close	26-Aug	19-Nov	25-Oct	24-Sep	20-Oct	17-Nov	6-Oct	3-Nov	27-Mar	4-Sep	11-Feb	16-Sept	22-Aug	20-Sept	17-Oct
Northern Zone	TLR	12-Nov	x	30-Nov	30-Oct	x	x	27-Nov	27-Dec	x	x	26-Oct	x	30-Aug	25-Sept	x
	Close	19-Nov	10-Nov	5-Dec	13-Nov	x	x	x	x	x	24-Oct	4-Apr	7-Oct	5-Oct	12-Oct	27-Oct
Southern Zone Handline	TLR	20-Feb	11-Mar	5-Mar	20-Mar	25-Feb	25-Feb	3-Mar	22-Mar	28-Feb	7-Feb	8-Mar	x	17-Mar	16-Feb	x
	Close	2-Mar	23-Mar	x	9-Apr	x	12-Mar	10-Apr	x	x	15-Feb	23-Mar	26-Feb	12-Mar	21-Feb	5-Feb
Southern Zone Gillnet	Close	28-Jan	7-Mar	25-Jan	5-Feb	30-Jan	23-Jan	2-Feb	21-Jan	x	29-Jan	20-Feb	28-Jan	7-Mar	25-Jan	5-Feb

Alternative 1 would maintain the current commercial zone quotas for Gulf migratory group king mackerel. Since **Alternative 1** includes the Florida East Coast Subzone which, according to the most recent stock assessment (SEDAR 38 2014) is not part of the Gulf group king mackerel, the Gulf king mackerel commercial quotas in **Alternative 1** would result in unnecessarily unused subzone quotas. This would needlessly constrain commercial harvest in the Gulf, and could result in overharvest of the Atlantic migratory group after Gulf king mackerel commercial ACLs for the Gulf migratory group were met. Under the current commercial zone management system, the commercial ACL for Gulf king mackerel is typically harvested.

Alternative 2 would revise the commercial zone quotas for Gulf king mackerel by dividing the Florida East Coast Zone quota into four equal parts, to be added to each of the remaining Gulf commercial zone components. This alternative would add approximately 7.96% to each component's ACL, with the separate handline and gillnet components of the Gulf Southern Zone being treated independent of each other. The largest percentage increase would be observed in the Northern Zone, which would increase more than 100% to a quota equal to approximately 13.13% of the commercial ACL.

Alternative 3 would revise the commercial zone quotas for Gulf king mackerel by dividing each individual component's quota percentage by the sum of the quota percentages for all Gulf commercial components *except* the Florida East Coast Zone, with each resultant percentage becoming that respective component's new commercial allocation. This alternative relies upon the historical allocation amongst the zones to determine the new allocation.

Preferred Alternative 4 would revise the commercial zone quotas for Gulf king mackerel as follows: 40% for the Gulf Western Zone; 18% for the Gulf Northern Zone; 21% for the Gulf Southern Zone Handline component; and 21% for the Gulf Southern Zone Gillnet component.

These zone-specific allocations were recommended to the Gulf Council by the Gulf Council's CMP Advisory Panel (Gulf AP). The Gulf AP stated that enough capacity existed within each zone to harvest the quotas in **Alternatives 2 – 4 (Preferred)**.

Alternatives 2 – 4 (Preferred) are not expected to differ markedly from a physical and/or biological effects perspective from **Alternative 1**, in that the overall commercial ACL for Gulf king mackerel is still expected to be harvested. Since king mackerel are migratory in nature, the location of harvest becomes less critical from a biological standpoint compared to the quantity of fish harvested.

4.7.2 Direct and Indirect Effects on the Economic Environment

Alternative 1 would maintain the current commercial zone quotas for Gulf king mackerel and would not be expected to affect the methods of fishing for king mackerel, harvest and customary uses of king mackerel. Therefore, **Alternative 1** would not be expected to result in direct economic effects. However, **Alternative 1** could be expected to result in indirect adverse economic effects stemming from the potential king mackerel overharvests of the Atlantic migratory group once the Gulf king mackerel commercial ACLs for the Gulf migratory group are fully harvested.

Alternatives 2 - 4 (Preferred) would redistribute the Gulf king mackerel quota between the different zones. On its own, the redistribution of the Florida East Coast Subzone's quota amongst the remaining zones would not increase the total amount of king mackerel available for harvest. However, in conjunction with the ACL in Preferred Alternative 2 in Action 6, all zones would benefit from an increase in their respective ACL. Therefore, **Alternatives 2 - 4 (Preferred)** would be expected to result in economic benefits in all zones. In relative terms, the economic effects expected to result from these adjustments would be greatest for the zone that would receive the larger increase in its ACL. Table 2.7.3 provides the Gulf king mackerel ACL for each zone. For the Gulf Western Zone, **Alternative 3** would be expected to result in the greatest level of economic benefits. For the Gulf Northern and Gulf Southern Zones, greatest economic benefits would be expected to result from **Alternatives 4 (Preferred)** and **2**, respectively. In absolute terms, the Gulf Northern Zone, which could enjoy the largest increase in its ACL under **Preferred Alternative 4**, would be expected to benefit from the largest level of economic benefits.

4.7.3 Direct and Indirect Effects on the Social Environment

Under **Alternative 1** (No Action), the FLEC commercial zone quota would remain. Because the FLEC subzone would be removed under Action 1 (Preferred Alternative 3), the ACL assigned to this subzone would go unused unless the commercial zone quotas are modified through this action.

Alternatives 2, 3, and **Preferred Alternative 4** propose different ways to distribute the Gulf group ACL among the remaining zones and gear types. Positive effects would be expected from a new zone allocation that provides a corresponding amount of quota that is greater than under **Alternative 1**. To compare the resulting zone allocations under the alternatives, Table 2.7.3

provides the pounds which would result under each allocation using the current Gulf commercial ACL of 3.456 mp. For all of the zones and under each of **Alternatives 2, 3,** and **Preferred Alternative 4**, the resulting allocation is greater than **Alternative 1**. Thus, any of **Alternatives 2, 3,** or **Preferred Alternative 4** would result in greater benefits than **Alternative 1**. The benefits that would be expected under each alternative would vary by zone and relate to the amount of additional quota that results from the increase in the zone's allocation.

Among **Alternatives 2, 3,** and **Preferred Alternative 4**, the allocations under **Alternative 3** would most closely reflect existing fishing activity and behavior in each zone, as the allocations are based on a proportional distribution of the Florida East Coast Subzone allocation among the other zones. Thus, the benefits expected to result from **Alternative 3** would be realized proportionately among zones. Distributing the Florida East Coast Subzone quota equally among the other zones (**Alternative 2**) would benefit the Northern Zone the most, which currently has the lowest zone allocation (5.17%). **Alternative 2** would also result in some additional benefits to the Southern Zone (both gear types), compared with **Alternative 3**. **Preferred Alternative 4** would provide the greatest benefits to the Northern Zone among the alternatives, while still providing allocation increases to the other zones.

4.7.4 Direct and Indirect Effects on the Administrative Environment

Alternative 1 would maintain the current administrative environment, and would not result in any new administrative burdens. **Alternatives 2 – 4 (Preferred)** would revise those commercial zone allocations described in **Alternative 1**; however, since NMFS remains responsible for monitoring commercial king mackerel harvest for both the Gulf and Atlantic migratory groups of king mackerel, the administrative burden for **Alternatives 2 – 4 (Preferred)** is expected to remain mostly unchanged from that of **Alternative 1**.

4.8 Action 8. Revise the Recreational and Commercial Allocations for the Gulf Migratory Group King Mackerel

Preferred Alternative 1: No action – Maintain the current recreational and commercial allocations for Gulf migratory group king mackerel (68% recreational, 32% commercial).

Alternative 2: Revise the recreational and commercial allocations for Gulf migratory group king mackerel by dividing the stock ACL using one of the options below.

Option a: 63% to the recreational sector, and 37% to the commercial sector.
Option b: 58% to the recreational sector, and 42% to the commercial sector.
Option c: 48% to the recreational sector, and 52% to the commercial sector.

Alternative 3: Revise the recreational and commercial allocations for Gulf migratory group king mackerel by transferring a percentage of the stock ACL to the commercial allocation annually until such a time that the recreational sector lands 80% of its allocation, after which no additional allocation will be transferred from the stock ACL to the commercial allocation.

Option a: Transfer 2% of the stock ACL annually to the commercial allocation.
Option b: Transfer 5% of the stock ACL annually to the commercial allocation.

Alternative 4: Conditionally transfer a certain percentage (*Options a-d*) of the stock ACL to the commercial sector until such a time that recreational landings reach a predetermined threshold (*Options e-g*). If this threshold is met, the recreational and commercial allocations will revert to 68% for the recreational sector and 32% for the commercial sector.

Conditional Quota Transfer (MUST CHOOSE ONE):
Option a: Transfer 5% of the stock ACL to the commercial sector.
Option b: Transfer 10% of the stock ACL to the commercial sector.
Option c: Transfer 15% of the stock ACL to the commercial sector.
Option d: Transfer 20% of the stock ACL to the commercial sector.

Recreational ACL Threshold (MUST CHOOSE ONE):
Option e: Revert to the status quo sector allocations if 80% of the adjusted recreational sector ACL is landed.
Option f: Revert to the status quo sector allocations if 90% of the adjusted recreational sector ACL is landed.
Option g: Revert to the status quo sector allocations if 100% of the adjusted recreational sector ACL is landed.

Alternative 5: Establish a sunset provision for any change in the sector allocations for Gulf migratory group king mackerel. After the predetermined time period, any change in sector allocations would revert back to the allocations specified in the original Coastal Migratory Pelagics Fishery Management Plan for the Gulf of Mexico (68% for the recreational sector and 32% for the commercial sector).

Option a: Sunset any change in sector allocations after a five year period (2016-2020).
Option b: Sunset any change in sector allocations after a ten year period (2016-2025).
Option c: Sunset any change in sector allocations after a fifteen year period (2016-2030).

4.8.1 Direct and Indirect Effects on the Physical and Biological Environments

King mackerel are usually caught at the ocean surface, and typical gear types used in the harvest of king mackerel do not normally come in contact with bottom habitat. Therefore, the alternatives presented in Action 8 are not expected to result in any previously unconsidered direct effects to the physical environment. This action could indirectly affect the physical environment if changes in allocation result in an increase or decrease in the amount of fishing gear used to harvest the respective commercial and recreational quotas, which in turn could increase the probability of gear becoming lost and fouled (Barnette 2001).

Removal of fish from the population through fishing can reduce the overall population size if harvest is not maintained at sustainable levels. Effects of these alternatives on the biological environment would depend on the resulting reduction or increases in the level of fishing as a result of each alternative. Indirect impacts of these alternatives on the biological environment would depend on the resulting change in the level of commercial king mackerel fishing effort in the Gulf. In a 2015 biological opinion, NOAA determined that the hook-and-line component of the CMP commercial fishery would not significantly impact protected species; however, the gillnet component of the CMP commercial fishery may significantly impact protected sharks, turtles, and marine mammals. See Section 3.2 for more information.

The no action alternative (**Preferred Alternative 1**) would maintain the current allocation of 68% of the Gulf king mackerel ABC reserved for the recreational sector, and the remaining 32% reserved for the commercial sector. **Preferred Alternative 1** would not result in any change in effects to the physical or biological environments.

Alternatives 2 – 4 propose, through different methods, some manner of reallocation from the stock ACL to the commercial sector. The resultant allocations from each proposed alternative, as intended by the Councils, are shown in Table 2.8.1. Since the recreational sector *is not* currently landing its allocation, and the commercial sector *is* landing its allocation (Table 2.8.1), any transfer of unharvested fish to the commercial sector would likely result in additional removals from the Gulf king mackerel stock. It is also because of this trend in landings that the Councils are not considering reallocating some portion of the stock ACL to the recreational sector. These proposed additional removals would constitute a negative biological effect; however, so long as the respective sector ACLs are not exceeded, the effect of additional harvest on the stock is not expected to impact the long-term sustainability of Gulf king mackerel.

The difference between **Alternatives 2** and **3** is that **Alternative 2** would transfer the prescribed amount of allocation (5%, 10%, or 20%; **Options a-c**) all at once, while **Alternative 3** would do so gradually over time (either 2% [**Option a**] or 5% [**Option b**] annually). Any negative effects from selecting **Alternative 2** would depend on the amount of allocation to be transferred to the commercial sector, with those effects becoming more substantial as the amount of allocation to be transferred increases. Negative effects from **Alternative 3** would be spread out over time, but could ultimately be greater than those on **Option c** of **Alternative 2** depending on how much allocation is actually transferred to the commercial sector. Ultimately, the amount of additional king mackerel, which would be removed from the migratory group under **Alternative 3**, is unknown and completely dependent upon changes in future recreational fishing effort. However, so long as the sector ACLs are not exceeded, neither **Alternative 2** nor **3** are expected to impact

the long-term sustainability of Gulf king mackerel. Important to note are the increased landings of recreational king mackerel from the 2014/2015 fishing season (Table 2.8.1), which increased approximately 63% over the previous fishing year's landings.

Alternative 4 would conditionally transfer a certain percentage of the stock ACL (%5, 10%, 15%, or 20%; **Options a-d**) to the commercial sector until such a time that recreational landings reach a predetermined threshold (80%, 90%, or 100%; **Options e-g**). If this threshold is met, the recreational and commercial allocations would revert to 68% for the recreational sector and 32% for the commercial sector. **Alternative 4** differs from **Alternatives 2** and **3** in that the allocation transfer in **Alternative 4** only exists so long as the recreational sector's landings do not reach the prescribed threshold, while the allocation transfers in **Alternatives 2** and **3** are considered permanent unless adjusted by the Councils through future action, or unless an option in **Alternative 5** is chosen. Biological effects from **Alternative 4** would be similar to those in **Alternatives 2** and **3** in that more king mackerel are likely to be harvested; however, as was previously stated, so long as the respective sector ACLs are not exceeded, the effect of additional harvest on the stock is not expected to impact long-term sustainability. Additionally, the 63% increase in recreational landings between the 2013/2014 and 2014/2015 fishing seasons (Table 2.8.1) should be considered when selecting a preferred alternative in Action 8.

Alternative 5 would establish a sunset provision for any change in the sector allocations for Gulf king mackerel. After the predetermined time period, any change in sector allocations would revert back to 68% for the recreational sector and 32% for the commercial sector. **Alternative 5** can only be selected as preferred in conjunction with one of **Alternatives 2 – 4**. Increases in effects from fishing on the physical and biological environment are generally correlated to increases in fishing effort. Any future changes in fishing effort would be due to other factors and independent of the presence or length of the sunset period. If **Alternative 5** is selected as preferred along with some other change in sector allocation, the biological effects of removing additional king mackerel through commercial harvest (**Alternatives 2 – 4**) would persist only for the time period permitted in **Alternative 5**.

4.8.2 Direct and Indirect Effects on the Economic Environment

Preferred Alternative 1 would continue to allocate 68% and 32% of the Gulf king mackerel ACL to the recreational sector and commercial sector, respectively. **Preferred Alternative 1** would not be expected to affect the recreational or commercial harvests and other customary uses of Gulf king mackerel. Therefore, **Preferred Alternative 1** would not be expected to result in direct economic effects. However, **Preferred Alternative 1** would be expected to continue to result in indirect adverse economic effects stemming from forgone fishing opportunities. Recreational anglers harvest well below their allotted ACL. Forgone opportunities in the recreational sector could potentially generate economic benefits if the commercial sector, which has typically harvested its ACL, was allowed to harvest portions of the ACL currently left unused. **Alternatives 2 - 4** propose various reallocation approaches to facilitate the harvest of portions of the unused Gulf king mackerel ACL.

Alternative 2 would reallocate a portion of the Gulf king mackerel stock ACL to the commercial sector. **Options a**, **b**, and **c** would reallocate 5%, 10%, and 20% of the stock ACL to the commercial sector, respectively. Excluding considerations relative to non-use values, e.g.,

option value, **Alternative 2** would not be expected to result in economic effects to the recreational sector. Because the recreational sector consistently harvests below its assigned ACL, none of the proposed reallocations in **Alternative 2** would be expected to result in economic losses to the sector. In contrast, the commercial sector has typically harvested all of its ACL. Therefore, the commercial sector would be expected to potentially benefit from additional harvest opportunities afforded by proposed reallocations to the sector. The amount reallocated and the extent to which commercial fishermen elect to take advantage of the available additional harvest opportunities would determine the magnitude of the potential economic benefits expected to result from **Alternative 2.**

Alternative 3 proposes a gradual reallocation of portions of the Gulf king mackerel stock ACL to the commercial sector until the recreational sector lands 80% of its ACL. As discussed in **Alternative 2**, reallocations to the commercial sector would not be expected to affect the recreational sector as long as that sector's king mackerel landings continue to be well below the recreational ACL. Like **Alternative 2**, **Alternative 3** would also be expected to result in economic benefits for the commercial sector. These potential economic benefits would be dependent on the magnitude of the additional commercial harvests that would result from the reallocation of portions of the stock ACL.

Alternative 4 would conditionally reallocate a portion of the Gulf king mackerel stock ACL to the commercial sector provided that the recreational sector's landings are below a preset threshold. **Options a – d** would reallocate 5%, 10%, 15%, and 20% of the stock ACL to the commercial sector, respectively. **Options e**, **f**, and **g** would set recreational landings thresholds at 80%, 90% and 100% of the recreational ACL, respectively. If the threshold is reached, the commercial and recreational allocations would revert to 32% and 68% of the stock ACL, respectively. Based on the recreational king mackerel landings recorded up to the 2013/2014 fishing season, it was not likely that any one of the proposed thresholds would be met in the foreseeable future. However, the recreational landings for the 2014/2015 fishing season were 63% higher than the previous fishing year (Table 2.8.1), which may indicate an increased capacity for recreational fishing effort. Similar to **Alternatives 2** and **3**, **Alternative 4** would not be expected to result in economic effects for the recreational sector, so long as the recreational sector did not exceed its ACL. Commercial fishermen would be expected to benefit from increased harvest opportunities afforded by proposed reallocations to their sector. The amount reallocated and the propensity with which commercial fishermen to take advantage of the additional harvest opportunities would determine the size of the potential economic benefits expected to result from **Alternative 4**.

Alternative 5 would establish a sunset for any reallocation (**Alternatives 2 – 4**) after a predetermined time period and revert to the no action allocation. **Options a**, **b**, and **c** would sunset reallocations after a five-year, ten-year, and fifteen-year period, respectively. **Alternative 5** is not comparable to the previous alternatives and would eliminate expected economic benefits for the commercial sector on the sunset date.

4.8.3 Direct and Indirect Effects on the Social Environment

Over the last decade, the commercial sector has regularly landed near the commercial ACL, while the recreational sector has landed decreasingly lower proportions of the recreational ACL

(Table 2.8.1). For example, over the last ten years, the recreational sector has harvested an average 38% of the recreational ACL, and in each of those years, the recreational sector landed less than half of its ACL. However, as noted in Section 2.8, increased landings would not be expected to negatively affect the health of the stock so long as the ABC is not exceeded. King mackerel is not overfished or undergoing overfishing (SEDAR 38 2014), and the total amount of allowable harvest is expected to increase through this amendment (Action 6).

Preferred Alternative 1 (No Action) would retain the current sector allocations for the Gulf migratory group king mackerel ACL. Although additional effects would not be expected under **Preferred Alternative 1** as fishing practices and customary uses of Gulf group king mackerel would not change, optimum yield is not being achieved. Thus, indirect negative effects would be expected to continue under **Preferred Alternative 1** as fishing opportunities continue to go unused.

It is possible that some of these foregone fishing opportunities could be used by the recreational sector through an increase in the bag limit, as evaluated in Action 9. However, increasing the bag limit is not expected to increase landings substantially (Sections 2.9 and 4.9), and it is likely that the recreational sector would continue to harvest well below its sector ACL even under a larger bag limit. Further, the recreational sector does not have a closed season for the harvest of king mackerel; the fishing season is open year-round. Thus, it is not possible to further extend when the recreational sector may harvest king mackerel. However, these unused fishing opportunities could provide benefits to the commercial sector, which typically harvests its sector ACL. The commercial fishing zones are regularly closed when the ACL for a zone is estimated to be reached; in some zones, the quota is caught quickly resulting in a very short season. It is highly likely that allocating some of the unused recreational fishing opportunities to the commercial sector would result in those fish being caught. In turn, benefits would result for the commercial sector.

Because **Alternatives 2 – 4** all transfer a certain amount of quota from the recreational sector to the commercial sector, the types of effects on the social environment would be similar among the alternatives. The effects would vary in scope and strength relative to the amount of quota that is reallocated. Most generally, the quality of social impacts differs between the sectors, in that a gain of commercial access to king mackerel could benefit the livelihoods of commercial fishermen, especially small-scale owner-operators, hired captains and crew, and the well-being of commercial communities. Direct effects would not be expected for the recreational sector, which is not catching its portion of the quota. Should fishing behavior change or effort increase substantially in the future such that the recreational sector meets its quota, a reallocation of quota could result in constraints on recreational fishing opportunities, which would entail some negative effects for the recreational sector. However, given current fishing practices and behavior, it seems unlikely for recreational effort towards king mackerel to increase substantially in the near future. Further, there are no additional biological benefits to allowing a portion of the allowable harvest to remain in the water, unfished, since the stock is not overfished or undergoing overfishing. Thus, no long-term benefits would be expected for the recreational sector by not harvesting part of its quota. **Alternatives 2 – 4** propose various reallocation approaches to facilitate the harvest of portions of the unused Gulf migratory group king mackerel ACL. Compared with **Preferred Alternative 1**, social benefits would be expected for the

commercial sector under each of **Alternatives 2 – 4**, while no effects would be expected for the recreational sector.

Alternative 2 would reallocate a set portion of the recreational ACL to the commercial sector, 5% (**Option a**), 10% (**Option b**), or 20% (**Option c**). Because the recreational sector consistently harvests well below its assigned ACL, none of the proposed reallocation options in **Alternative 2** would be expected to affect the recreational sector. In contrast, the commercial sector has typically harvested the totality of its ACL. Therefore, the commercial sector would be expected to benefit from additional harvest opportunities afforded by proposed reallocations to the sector. The amount reallocated and the extent to which commercial fishermen elect to take advantage of the available additional harvest opportunities would determine the magnitude of the potential benefits expected to result from **Alternative 2**. Greater benefits would be expected from a larger reallocation (**Option c**) compared with a smaller reallocation (**Option a**), as commercial fishermen are able to take advantage of greater harvest opportunities.

Alternative 3 would gradually reallocate portions of the Gulf migratory group king mackerel recreational ACL to the commercial sector until the recreational sector lands 80% of its ACL. As discussed in **Alternative 2**, reallocations to the commercial sector would not be expected to affect the recreational sector as long as recreational king mackerel landings remain well below the recreational ACL. Like **Alternative 2**, **Alternative 3** would also be expected to result in benefits for the commercial sector, which would relate to the magnitude of the additional commercial harvests that would result from the reallocation. The benefits to the commercial sector from **Alternative 3** would be greater and realized sooner under **Option b** than **Option a**.

Alternative 4 would conditionally reallocate a portion of the recreational ACL to the commercial sector (**Options a – d**), provided that the recreational sector's landings are below a preset threshold (**Options e – g**). If the threshold is reached, the recreational and commercial sector allocation would revert to that under **Preferred Alternative 1**, 68% and 32% of the total ACL, respectively. Based on the recreational king mackerel landings recorded during the past 15 years, it is not likely that any one of the proposed thresholds (**Options e – g**) would be met in the foreseeable future. Similar to **Alternatives 2** and **3**, **Alternative 4** would not be expected to result in effects for the recreational sector. Positive effects would be expected for the commercial sector, which would benefit from increased harvest opportunities afforded by the proposed reallocations. These benefits would relate to the extent that commercial fishermen take advantage of the additional harvest opportunities, with greater positive effects expected from a larger reallocation (**Option d**) than a smaller reallocation (**Option a**). Intermediary effects would be expected from **Options b** and **c**.

It would be expected that additional harvest opportunities allocated to the commercial sector would be used. Thus, some negative effects would be expected to result for commercial fishermen in the future from a conditional transfer of allocation (**Alternative 4**), should the selected recreational ACL threshold be reached (**Options e – g**). These negative effects would arise from a decrease in harvest opportunities as the allocation is reset to that under **Preferred Alternative 1**. For example, if **Alternative 4 Options c** and **e** are selected as preferred, the allocation would be conditionally set at 53% recreational and 47% commercial until 80% of the recreational sector's conditional ACL is reached. Should the recreational sector land 85% of its conditional ACL under these options in 2017, the allocation would revert to 68% recreational

and 32% commercial (**Preferred Alternative 1**) in 2018. Assuming the Council's preferred alternative is adopted in Action 6 to modify the Gulf king mackerel ACL, the Gulf ACL will be 8.88 mp in 2017 and 8.71 mp in 2018. Under this scenario, the recreational sector would have caught 4.00 mp in 2017 (85% of its 4.71 mp ACL), and the recreational sector ACL would be 5.92 mp in 2018. No additional benefits would result for the recreational sector, and it would be highly likely that optimum yield would not be achieved in 2018. On the other hand, the commercial sector would realize a decrease in the commercial ACL from 4.17 mp in 2017 to 2.79 mp in 2018; negative effects would be expected as landings currently average greater than 3.00 mp. Should a recreational ACL threshold be reached, recreational fishermen would realize an increase in the amount of king mackerel harvest opportunities. However, these increased opportunities would only result in positive effects if the recreational sector increases king mackerel landings substantially. This would be more likely under a threshold that comes closest to the adjusted recreational sector landings under **Option g**, compared with **Option e**. Nevertheless, even under **Option g**, if the recreational sector landed 100% of its 2017 conditional ACL (4.71 mp), the recreational ACL in 2018 would be 5.9 mp. It would be unlikely for the recreational sector to land this increase in its ACL, and no benefits would be expected.

Alternative 5 would end the reallocation implemented through this action after 5 (**Option a**), 10 (**Option b**), or 15 years (**Option c**), and the allocation would revert to that under **Preferred Alternative 1**, the sector allocation established in 1983. The effects from **Alternative 5** would be similar to those under **Alternative 4 Options e – g**, in that the benefits to the commercial sector from a reallocation would be forfeit at the time of the sunset, while benefits to the recreational sector from an increase in allowable harvest may not be realized.

4.8.4 Direct and Indirect Effects on the Administrative Environment

The alternatives provide options, which ultimately change the division of quota among the commercial and recreational sectors. The change in the division of the ACL under **Alternative 2** would not result in any increase in administrative burden compared to **Preferred Alternative 1**, besides the noticing of the resultant changes in allocation and commercial season lengths in the Federal Register. **Alternatives 3** and **4** both would result in increased administrative burdens in the form of increased personnel hours to track sector landings of Gulf king mackerel and to apply the prescribed modifications when necessary. These additional administrative burdens would be greater with **Alternative 3** than **Alternative 4**, since **Alternative 3** constitutes a continual modification over time while **Alternative 4** constitutes a single allocation transfer, which only changes if the prescribed recreational landings threshold is met.

Alternative 5 would add a sunset provision, which would result in the expiration of any changes in sector allocations after five years (**Option a**), ten years (**Option b**), or fifteen years (**Option c**). If this alternative is selected as preferred, it would result in a negative effect on the administrative environment in that the allocations would have to be changed back to the current status quo. This adverse effect to the administrative environment would come in the form of additional rulemaking. The likelihood of this occurring would be greatest under **Option a,** and least under **Option c**.

Other administrative burdens that may result from all of the action alternatives considered would take the form of development and dissemination of outreach and education materials for fishery participants.

4.9 Action 9. Modify the Recreational Bag Limit for Gulf Migratory Group King Mackerel

Alternative 1: No action - Maintain the current recreational bag limit of two fish per person per day.

Preferred Alternative 2: Increase the bag limit to three fish per person per day.

Alternative 3: Increase the bag limit to four fish per person per day.

4.9.1 Direct and Indirect Effects on the Physical and Biological Environments

Alternative 1 would maintain the recreational sector's daily bag limit at two king mackerel per person. Therefore, this alternative should have no additional effects on the physical environment. **Preferred Alternative 2** and **Alternative 3** could increase fishing effort; however, any adverse effects to the physical environment would likely not be significant. As described in Section 2.9 and Appendix C, few fishermen catch more than one king mackerel on any given trip, minimizing the likelihood of a substantial increase in king mackerel fishing effort. Finally, as described in Section 4.1.1, gear used to fish for king mackerel minimally impacts bottom habitat.

The biological impacts of increasing the daily bag limit are also expected to be minimal because only 7% of anglers catch the current bag limit. Estimating how much landings might increase as the bag limit increases is difficult because that involves speculation about how many anglers would catch the higher bag limit. The two methods used to estimate these increases assume that either all fishermen harvesting two king mackerel now would harvest the higher bag limit, or that all king mackerel discarded now would be kept (Appendix C). The increase in recreational landings relative to the status quo (**Alternative 1**) range 1-10% with a three-fish bag limit (**Preferred Alternative 2**), and 3-21% with a four-fish bag limit (**Alternative 3**). The minor increases in landings with **Preferred Alternative 2** or **Alternative 3** would not be expected to substantially impact the status of the stock because even with the largest estimated increase, mortality of king mackerel would still be expected to be well within the ABC and the ACL.

In general, a higher bag limit would be expected to result in fewer discards. However, under the current two-fish bag limit (**Alternative 1**), most recreational anglers have no discards of king mackerel, and very few have more than one discarded fish (Figure 4.9.1). Nevertheless, some small reduction in discards would be expected under **Alternatives 2** (**Preferred**) or **3**. The Data Workshop for SEDAR 38 (2014) used 20% mortality for discards from private angling and charter trips and 33% mortality from headboats. Likewise, little to no increase in bycatch would be expected.

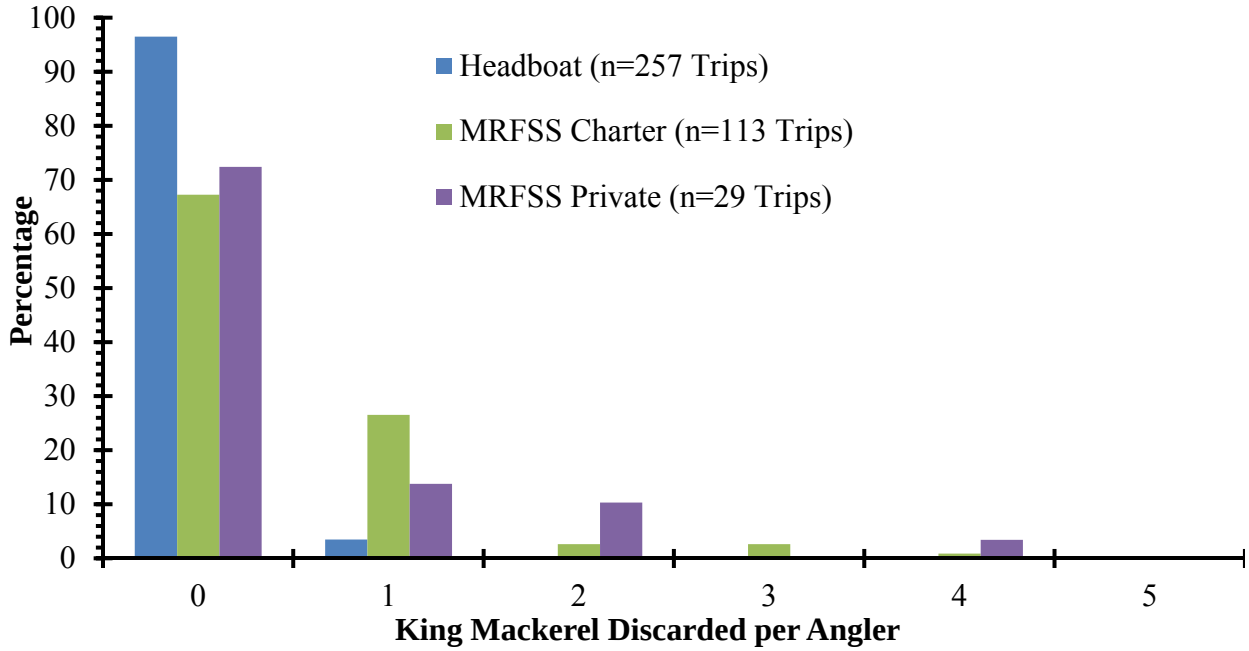

Figure 4.9.1. Distribution of Gulf king mackerel discarded per angler by mode from MRFSS and Headboat data. Texas Parks and Wildlife Department (TPWD) data are not included because no discard information is collect in the TPWD survey. The data used are from 2011 through 2013.

4.9.2 Direct and Indirect Effects on the Economic Environment

Alternative 1 would maintain the current two-fish recreational bag limit for Gulf king mackerel and would not be expected to affect the recreational harvest and other customary uses of king mackerel. Therefore, **Alternative 1** would not be expected to result in direct economic effects. However, **Alternative 1** would be expected to continue to result in indirect adverse economic effects stemming from forgone fishing opportunities for the recreational sector. Because recreational anglers harvest well below their allotted ACL, a failure to increase the bag limit would continue to deprive recreational anglers from additional harvests and associated economic benefits.

Alternatives 2 (**Preferred**) and **3** would increase the recreational bag limit for Gulf king mackerel to 3 and 4 fish, respectively. Relative to **Alternative 1**, **Alternatives 2** (**Preferred**) and **3** would provide recreational anglers opportunities to harvest more fish. However, because more than 90% of recreational anglers prosecuting Gulf king mackerel landed less than the current two-fish limit, the extent to which anglers would take advantage of the additional opportunities to harvest more king mackerel is expected to be limited. Modelling approaches proposed in Appendix C suggest that **Preferred Alternative 2** could increase king mackerel harvest between 0.9% and 10.1%. **Alternative 3** is estimated to increase harvests between 3.1% and 21.1%. Therefore, **Alternatives 2** (**Preferred**) and **3** would be expected to result in economic effects commensurate with the estimated increases in recreational landings. Although bag limit increases could result in shorter fishing seasons due to increased harvest rates, the

proposed increases in Gulf king mackerel recreational bag limit would not be expected to affect the season because the recreational sector currently lands much less than its ACL.

4.9.3 Direct and Indirect Effects on the Social Environment

Over the last 10 fishing seasons, the recreational sector in the Gulf has harvested an average of 38% of its king mackerel sector ACL (Table 2.8.1). There is no restriction to the recreational fishing season for king mackerel; it is open year-round. The minimum size limit is 24 inches TL; a 24-inch king mackerel is younger than age 3 and only some females may have reached sexual maturity by this size. King mackerel have longevities of over 20 years for both males and females (Section 3.3). Thus, the 24 inch TL minimum size limit for this healthy stock is not likely a constraint on angler's harvest. This leaves the bag limit as the remaining effort constraint which could potentially be restricting harvest. In general, increasing a bag limit would be associated with direct social benefits, while decreasing a bag limit would be associated with direct negative effects, as anglers are allowed to keep more or fewer fish, respectively.

Additional effects would not be expected from retaining the two fish per person per day bag limit under **Alternative 1** (No Action). Given the low landings by the recreational sector and the size of the sector's ACL, a bag limit increase would be one mechanism for allowing the recreational harvest to increase. Increasing the bag limit to three fish per person per day (**Preferred Alternative 2**) would be expected to increase recreational landings by an estimated 1-10%. Increasing the bag limit to four fish per person (**Alternative 3**) would allow recreational landings to increase by an estimated 3-21%. If the higher ends of the estimates are used and **Alternative 3** is selected as preferred, the recreational sector would still be expected to leave approximately 26% of the recreational ACL unharvested.

It remains unknown how angler behavior would change with an increase in the bag limit. King mackerel is an important recreational target species and is included in many recreational fishing tournaments. However, most anglers do not land even one king mackerel per day, despite the bag limit being two fish per person per day. Unlike red snapper and gag which are highly desirable food fish among anglers, it is possible that many anglers do not retain one or more king mackerel because it is not as desirable of a food fish. According to *Florida Sportsman*,[5] its food value "depends on [the] taste of the individual." It is likely that anglers value the experience of catching king mackerel, which is known as a strong and fast fish, more than as a food source. For these reasons, the benefits which would be expected from increasing the recreational bag limit for a popular species may not be realized for king mackerel. Nevertheless, the direct benefits of increasing the bag limit to three fish per person per day (**Alternative 2**) would be somewhat greater than **Alternative 1**. Given the low current harvest rate, the potential additional benefits between a three fish bag limit (**Preferred Alternative 2**) and four fish bag limit (**Alternative 3**) would likely be minimal.

[5] http://www.floridasportsman.com/sportfish/kingmackerel/

4.9.4 Direct and Indirect Effects on the Administrative Environment

The alternatives in this action are expected to have nominal differences in the direct and indirect impacts on the administrative environment. **Alternative 1** would have the least burden on the administrative environment, because it would maintain the daily bag limit of two king mackerel per angler per day. **Preferred Alternative 2** and **Alternative 3** would change the bag limit from **Alternative 1** creating an initial burden on the administrative environment. If the recreational king mackerel bag limit is modified (**Preferred Alternative 2** or **Alternative 3**) stakeholders and law enforcement officials would need to educate themselves initially about this change in the regulations.

4.10 Cumulative Effects Analysis

As directed by the National Environmental Policy Act (NEPA), federal agencies are mandated to assess not only the indirect and direct effects, but cumulative effects of actions as well. NEPA defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). Cumulative effects can either be additive or synergistic. A synergistic effect occurs when the combined effects are greater than the sum of the individual effects. The following are some past, present, and future actions that could impact the environment in the area where the CMP fishery is prosecuted.

Past Actions

The *Deepwater Horizon* MC252 (DWH) oil spill in 2010 affected at least one-third of the Gulf from western Louisiana east to the Florida Panhandle and south to the Campeche Bank of Mexico. Millions of barrels of oil flowed from the ruptured wellhead (www.restorethegulf.gov). The impacts of the DWH oil spill on the physical environment may be significant and long-term. Oil was dispersed on the surface, and because of the heavy use of dispersants (both at the surface and at the wellhead), oil was also suspended within the water column (Camilli et al. 2010; Kujawinski et al. 2011). Floating and suspended oil washed onto coastlines in several areas of the Gulf along with non-floating tar balls. Suspended and floating oil degrades over time, but tar balls persist in the environment and can be transported hundreds of miles (Goodman 2003).

Surface or submerged oil during the DWH oil spill event could have restricted the normal processes of atmospheric oxygen mixing into and replenishing oxygen concentrations in the water column affecting the long-standing hypoxic zone located west of the Mississippi River on the Louisiana continental shelf (NOAA 2010). Microbial biodegradation of hydrocarbons in the water column may have occurred without substantial oxygen drawdown (Hazen et al. 2010). Residence time of hydrocarbons in sediments is also a concern. The indices developed for past oil spills (Harper 2003) and oil spill scenarios (Stjernholm et al. 2011) such as the "oil residence index" do not appear to have been used during the assessment of the DWH oil spill.

The cumulative effects from the DWH oil spill and response may not be known for several years. The highest concern is that the oil spill may have impacted the spawning success of species that spawn in the summer months, either by reducing spawning activity or by reducing survival of the eggs and larvae. The oil spill occurred during spawning months for every species in the CMP FMP; however, most species have a protracted spawning period that extends beyond the months of the oil spill. The presence of hydrocarbons in marine environments have been shown to have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2011). Embryos of bluefin tuna, yellowfin tuna, and amberjack exposed to environmentally realistic levels of hydrocarbons showed defects in heart function (Incardona et al 2014). Other studies of the effects of hydrocarbon are ongoing.

If eggs and larvae were affected, impacts on harvestable-size king mackerel should begin to be seen when the 2010 year class becomes large enough to enter the fishery and be retained. The impacts would be realized as reduced fishing success and reduced spawning potential. King mackerel mature at age 3-4; therefore, a year class failure in 2010 could have been observed as early as 2013 or 2014. No data were available which demonstrated any such potential for year-class failure during Southeast Data Assessment and Review (SEDAR) 38. Any new data generated since the completion of SEDAR 38 would need to be taken into consideration in the next SEDAR assessment update of king mackerel.

Participation in and the economic performance of the CMP fishery addressed in this document have been affected by a combination of regulatory, biological, social, and external economic factors. Regulatory measures have obviously affected the quantity and composition of harvests of king mackerel, through the various size limits, seasonal restrictions, trip or bag limits, and quotas. In addition to a complex boundary and quota system, the CMP fishery also exists under regulations on bag limits, size limits, trip limits, and gear restrictions.

Amendment 20B, implemented in March 2015, allowed transit of vessels with king mackerel through areas closed to king mackerel fishing. This allows vessels docked outside of their fishing area to land king mackerel at their homeport rather than transporting to a more distant port. This should improve safety at sea, and increase efficiency for some king mackerel vessels.

Actions in CMP Framework Amendment 3, implemented January 2016, increased the trip limit, imposed a payback provision if the ACL is exceeded, changed reporting requirements for dealers buying gillnet-caught king mackerel, and removed inactive permits. These actions were requested by the gillnet fishermen and are perceived as generally improving conditions for participants in this component of the fishery. The higher trip limit is expected to shorten the fishing season and increase the risk of exceeding the ACL; however, the payback provision will account for any ACL overages.

The commercial king mackerel permit, king mackerel gillnet permit, and the Gulf Charter/Headboat pelagic fish permit are all under limited entry permit systems. New participation in the king mackerel commercial CMP sector and the for-hire CMP sector in the Gulf require access to additional capital and an available permit to purchase, which may limit opportunities for new entrants. The gillnet permits can only be transferred to an immediate family member. Additionally, almost all fishermen or businesses with one of the limited entry permits also hold at least one (and usually multiple) additional commercial or for-hire permit to maintain the opportunity to participate in other fisheries. Commercial fishermen, for-hire vessel owners and crew, and private recreational anglers commonly participate in multiple fisheries throughout the year. Even within the CMP fishery, effort can shift from one species to another due to environmental, economic, or regulatory changes. Overall, changes in management of one species in the CMP fishery can impact effort and harvest of another species (in the CMP fishery or in another fishery) because of multi-fishery participation that is characteristic in the Gulf and South Atlantic regions.

Biological forces that either motivate certain regulations or simply influence the natural variability in fish stocks have likely played a role in determining the changing composition of the king mackerel component of the CMP fishery. Additional factors, such as changing career or

lifestyle preferences, stagnant to declining prices due to imports, increased operating costs (gas, ice, insurance, dockage fees, etc.), and increased waterfront/coastal value leading to development pressure for other than fishery uses have impacted both the commercial and recreational fishing sectors. In general, the regulatory environment for all fisheries has become progressively more complex and burdensome, increasing the pressure on economic losses, business failure, occupational changes, and associated adverse pressures on associated families, communities, and businesses. Some reverse of this trend is possible and expected through management. However, certain pressures would remain, such as total effort and total harvest considerations, increasing input costs, import induced price pressure, and competition for coastal access.

Present Actions

No other actions related to the CMP fishery are in development at this time.

Reasonably Foreseeable Future Actions

The following regulatory actions affecting the CMP fishery may be implemented within the next year.

- Amendments establishing electronic reporting for for-hire vessels operating in Gulf and South Atlantic federal waters would improve landings data and accountability for that portion of the CMP fishery. These amendments are under development.
- The Gulf Council has requested initiation of an action to allow individuals on a commercially permitted vessel to retain the bag limit of king mackerel when commercial king mackerel fishing is closed. This will allow greater flexibility for fishermen.
- Amendment 29 explores issues associated with sector allocation sharing and associated accountability measures for the Gulf migratory group of king mackerel.

The Environmental Protection Agency's climate change webpage (http://www.epa.gov/climatechange/) provides basic background information on measured or anticipated effects from global climate change. A compilation of scientific information on climate change can be found in the United Nations Intergovernmental Panel on Climate Change's Fourth Assessment Report (Solomon et al. 2007). Those findings are incorporated here by reference and are summarized. Global climate change can affect marine ecosystems through ocean warming by increased thermal stratification, reduced upwelling, sea level rise, and through increases in wave height and frequency, loss of sea ice, and increased risk of diseases in marine biota. Decreases in surface ocean pH due to absorption of anthropogenic carbon dioxide emissions may impact a wide range of organisms and ecosystems. These influences could affect biological factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. At this time, the level of impacts cannot be quantified, nor is the time frame known in which these impacts would occur. These climate changes could have significant effects on southeastern fisheries; however, the extent of these effects is not known at this time (IPCC 2014).

In the southeast, general impacts of climate change have been predicted through modeling, with few studies on specific effects to species. Warming sea temperature trends in the southeast have been documented, and animals must migrate to cooler waters, if possible, if water temperatures exceed survivable ranges (Needham et al. 2012). King mackerels are migratory, and may shift

their distribution over time to account for the changing temperature regime. However, no studies have shown such a change yet. Higher water temperatures may also allow invasive species to establish communities in areas they may not have been able to survive previously. An area of low oxygen, known as the dead zone, forms in the northern Gulf each summer, and has been increasing in recent years. Climate change may contribute to this increase by increasing rainfall that in turn increases nutrient input from rivers. This increased nutrient load causes algal blooms that, when decomposing, reduce oxygen in the water (Needham et al. 2012; Kennedy et al. 2002). Other potential impacts of climate change in the southeast include increases in hurricanes, decreases in salinity, altered circulation patterns, and sea level rise. The combination of warmer water and expansion of salt marshes inland with sea-level rise may increase productivity of estuarine-dependent species in the short term. However, in the long term, this increased productivity may be temporary because of loss of fishery habitats due to wetland loss (Kennedy et al. 2002). Actions from this amendment are not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing.

The Southeast Regional Office hosted a workshop to discuss climate change impacts on fisheries in 2015 and is developing a regional action plan to address climate change impacts on fisheries in the southeast region. This regional action plan is guided by the NOAA Fisheries Climate Science Strategy document, issued in 2015.

Hurricane season is from June 1 to November 30, and accounts for 97% of all tropical activity affecting the Atlantic Basin. These storms, although unpredictable in their annual occurrence, can devastate areas when they occur. However, while these effects may be temporary, those fishing-related businesses whose profitability is marginal may go out of business if a hurricane strikes.

The cumulative social and economic effects of past, present, and future amendments may be described as limiting fishing opportunities in the short-term, with some exceptions of actions that alleviate some negative social and economic impacts. The intent of these actions is to improve prospects for sustained participation in the respective fisheries over time and the proposed actions in this amendment are expected to result in some important long-term benefits to the commercial fishing fleet, as well as fishing communities and associated businesses. The proposed changes in management for king mackerel will contribute to changes in the fishery within the context of the current economic and regulatory environment at the local and regional level.

Monitoring

The effects of the proposed action are, and will continue to be, monitored through collection of landings data by NMFS, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. Commercial data are collected through trip ticket programs, port samplers, and logbook programs.

The proposed action relates to the harvest of an indigenous species in the Gulf and Atlantic, and the activity being altered does not itself introduce non-indigenous species, and is not reasonably expected to facilitate the spread of such species through depressing the populations of native species. Additionally, it does not propose any activity, such as increased ballast water discharge

from foreign vessels, which is associated with the introduction or spread on non-indigenous species.

CHAPTER 5. REGULATORY IMPACT REVIEW

5.1 Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) It provides a comprehensive review of the level and incidence of impacts associated with a regulatory action; 2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives which could be used to solve the problem; and 3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost effective way. The RIR also serves as the basis for determining whether any proposed regulations are a "significant regulatory action" under certain criteria provided in Executive Order 12866 (E.O. 12866) and whether the approved regulations will have a "significant economic impact on a substantial number of small business entities" in compliance with the Regulatory Flexibility Act of 1980.

5.2 Problems and Objectives

The purpose and need, issues, problems, and objectives of this action are presented in Chapter 1 of this amendment and are incorporated herein by reference.

5.3 Description of the Fishery

A description of the Gulf of Mexico and South Atlantic coastal migratory pelagic fisheries is contained in Chapter 3 of this amendment and is incorporated herein by reference.

5.4 Effects on Management Measures

5.4.1 Adjust the Management Boundary for Gulf of Mexico (Gulf) and Atlantic Migratory Groups of King Mackerel

Preferred Alternative 3 would establish year-round boundaries between the Gulf of Mexico (Gulf) and South Atlantic migratory groups for king mackerel. The establishment of boundaries that remain unchanged during the year would be expected to be beneficial to fishermen because year-round boundaries would reduce confusion and possibly streamline enforcement. Therefore, **Preferred Alternative 3** would be expected to result in direct economic benefits. However, **Preferred Alternative 3** would eliminate the 50-fish trip limit currently in effect on the east coast of Florida during winter and could result in increased harvest rates and potentially increase the likelihood of overages. **Preferred Alternative 3** would therefore be expected to result in adverse economic effects if overages occur. Although unknown at this time, the magnitude of these potential adverse economic effects would be determined by the increased probability of recording overages, the size of the overages and by the severity of corrective measures that would be implemented as a result. It is noted that Action 5 in this amendment could establish

trip limits for the Atlantic Southern Zone that would apply to the Florida east coast. In that case, expected economic effects may also be dependent on the size of the trip limit for the Atlantic Southern Zone.

5.4.2 Update Reference Points and Revise the Annual Catch Limit (ACL) and Recreational Annual Catch Target (ACT) for Atlantic Migratory Group King Mackerel

5.4.2.1 Revise the Acceptable Biological Catch (ABC) for Atlantic Migratory Group King Mackerel

Relative to the no action alternative, **Preferred Alternative 2** would increase the ABCs for king mackerel. However, Action 2-1 by itself would not be expected to have measurable economic effects except in terms of how it influences the selection of the ACL under Action 2-2. **Preferred Alternative 2** relies on an optimistic assumption of high recruitment and could therefore have future direct long-term biological effects that would result in a smaller king mackerel biomass. A smaller biomass could have adverse economic effects making it more difficult to catch king mackerel, thus reducing economic efficiency. Conversely, an ABC that is set too low would keep fishermen from catching additional fish resulting in direct negative economic effects. On the other hand, if **Preferred Alternative 2** does not result in detrimental long term biological effects, the higher ABC would be expected to result in greater direct economic benefits.

5.4.2.2 Revise ACLs, Commercial Quotas, and Recreational ACT for Atlantic Migratory Group King Mackerel

Preferred Alternative 2 would set sector ACLs that are above any of the historical landings from 2000/2001 through 2013/2014 seasons. In general, higher ACLs and associated sector quotas would be expected to result in greater economic benefits if commercial fishermen and recreational anglers take advantage of the additional fishing opportunities. However, it is unknown whether in future years each sector would be able to harvest its entire ACL. Therefore, although economic benefits would be expected to result from **Preferred Alternative 2,** the size of the economic benefits would be determined by the extent to which each sector is able to increase its Atlantic king mackerel harvests.

5.4.3 Sale of Incidental Catch of Atlantic Migratory Group King Mackerel Caught in the Shark Drift Gillnet Fishery

Preferred Alternative 3 would allow fishermen to sell a limited amount of king mackerel caught incidentally in the shark gillnet fishery and reduce discards of king mackerel. The small number of fish that may be sold, as presented in Table 2.3.1, is not expected to cause any directed effort for king mackerel on shark gillnet trips. Therefore, **Preferred Alternative 3** would be expected to result in direct economic benefits because it would help reduce waste and increase the profits from the trip.

5.4.4 Establish Commercial Split Seasons for Atlantic Migratory Group King Mackerel in the Southern Zone

Preferred Alternative 2 would allocate 60% of the Southern Zone quota for Atlantic king mackerel quota to season 1 (March 1 - September 30) and 40% to the second season (October 1 – the end of February). Any remaining quota from the first season would be transferred to the second season. However, quota remaining form the second season would not be carried forward. Because Atlantic king mackerel harvests are constrained by the ACL (established in Action 2.2.1), change in the fishing year or temporal allocations within the Atlantic Southern Zone would not be expected to result in additional biological impacts on the stock or on protected species. Therefore, **Preferred Alternative 2** would not be expected to result in direct economic effects. Although unlikely to occur given the magnitude of historical harvests relative to the ACL proposed in Action 2.2.1, if the split seasons proposed in **Preferred Alternative 2** result in foregone fishing opportunities, adverse economic effects, proportional to the amount of harvest forgone, would be expected.

5.4.5 Establish a Trip Limit System for the Atlantic Southern Zone

Preferred Alternative 3 establishes a 50 fish trip limit for the area south of the Flagler/Volusia county line for the month of March and then a trip limit of 75 fish for the remainder of season 1. **Preferred Option 3b** decreases the trip limit to 50 fish if 75% of the ACL is met at any time during the first season. **Preferred Alternative 4** (**Preferred Option 4a**) would implement trip limits for season 2. If the trip limit step downs are applied, i.e., if the harvests reach the preset levels within the prescribed timeframes for seasons 1 or 2, **Preferred Alternatives 3** and **4** would be expected to extend the fishing season by decreasing the rate of harvest within the Atlantic Southern Zone. Under this scenario, trip limits would introduce inefficiencies and would be expected to result in adverse economic effects. Although net economic effects expected to result from **Preferred Alternatives 3** and **4** (**Preferred Option 4a**) are not known, based on the magnitude of the commercial ACL proposed in this amendment relative to the maximum historical commercial landings, the potential effects of the proposed trip limits proposed would be expected to be relatively limited.

5.4.6 Modify the ACL for Gulf Migratory Group King Mackerel

Between 2015 and 2019, the ACLs for Gulf king mackerel proposed in **Preferred Alternative 2** range from 9.62 to 8.55 mp. The 10.8 mp ACL in **Alternative 1** includes the Florida East Coast Subzone which, according to the most recent stock assessment, is no longer considered part of the Gulf migratory group (SEDAR 38 2014). Therefore, it is more appropriate to compare **Preferred Alternative 2** to a status quo ACL that excludes the Florida East Coast Subzone. During the last 15 years, Gulf king mackerel landings reached a maximum of 8.1 mp (Table 2.8.1). It is therefore not likely that the overall Gulf king mackerel ACL would be exceeded under **Preferred Alternative 2**. The recreational harvests are expected to continue to be well below the recreational ACL. Therefore, economic effects would not be expected to result from proposed decreases in recreational ACLs between 2015 and 2019. Commercial landings routinely meet and on a few instances exceed the commercial ACL. It is assumed that the commercial sector would continue to land the entirety of the proposed ACLs between 2015 and

2019. Based on these assumptions, annual Gulf king mackerel commercial landings would be expected to increase by an average of 0.525 mp under **Preferred Alternative 2**. The associated direct economic benefits that would be expected to result from **Preferred Alternative 2** are estimated at approximately $1.06 million per year.

5.4.7 Revise the Commercial Zone Quotas for Gulf Migratory Group King Mackerel

Preferred Alternative 4 would redistribute the Gulf king mackerel quota between the different zones. On its own, the redistribution of the Florida East Coast Subzone's quota amongst the remaining zones would not increase the total amount of king mackerel available for harvest. However, in conjunction with the ACL in Preferred Alternative 2 in Action 2-1, all zones would benefit from an increase in their respective ACL. Therefore, **Preferred Alternative 4** would be expected to result in economic benefits in all zones. In absolute terms, the Gulf Northern Zone, which would receive the largest increase in its ACL under **Preferred Alternative 4**, would be expected to enjoy the greatest level of economic benefits.

5.4.8 Revise the Recreational and Commercial Allocations for the Gulf Migratory Group King Mackerel

Preferred Alternative 1 would continue to allocate 68% and 32% of the Gulf king mackerel ACL to the recreational sector and commercial sector, respectively. **Preferred Alternative 1** would not be expected to affect the recreational or commercial harvests and other customary uses of Gulf king mackerel. Therefore, **Preferred Alternative 1** would not be expected to result in direct economic effects. However, because recreational anglers harvest well below their allotted ACL, **Preferred Alternative 1** would be expected to continue to result in indirect adverse economic effects stemming from forgone fishing opportunities. Forgone opportunities in the recreational sector could potentially generate economic benefits if the commercial sector, which has typically harvested its ACL, was allowed to harvest portions of the ACL currently left unused.

5.4.9 Modify the Recreational Bag Limit for Gulf Migratory Group King Mackerel

Preferred Alternative 2 would increase the recreational bag limit for Gulf king mackerel to 3 fish. Relative to **Alternative 1**, **Preferred Alternative 2** would provide recreational anglers opportunities to harvest more fish. However, because more than 90% of recreational anglers prosecuting Gulf king mackerel landed less than the current two-fish limit, the extent to which anglers would take advantage of the additional opportunities to harvest more king mackerel is expected to be limited. Modeling approaches proposed in Appendix C suggest that **Preferred Alternative 2** could increase king mackerel harvest between 0.9% and 10.1%. Therefore, **Preferred Alternative 2** would be expected to result in direct economic effects commensurate with the estimated increases in recreational landings. Although bag limit increases could result in shorter fishing seasons due to increased harvest rates, the proposed increases in Gulf king

mackerel recreational bag limit would not be expected to affect the season because the recreational sector currently lands much less than its ACL.

5.5 Public and Private Costs of Regulations

The preparation, implementation, enforcement, and monitoring of this or any federal action involves the expenditure of public and private resources, which can be expressed as costs associated with the regulations. Costs associated with this action include, but are not limited to Council costs of document preparation, meeting, and other costs; NMFS administration costs of document preparation, meetings and review, and annual law enforcement costs. A preliminary estimate is up to $200,000 before annual law enforcement costs.

5.6 Determination of Significant Regulatory Action

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

CHAPTER 6. REGULATORY FLEXIBILITY ACT ANALYSIS

Introduction

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

With certain exceptions, the RFA requires agencies to conduct a regulatory flexibility analysis for each proposed rule. The regulatory flexibility analysis is designed to assess the impacts various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those impacts. In addition to analyses conducted for the RIR, the regulatory flexibility analysis provides: 1) A statement of the reasons why rule by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for the proposed rule; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; 5) an identification, to the extent practical, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule; and, 6) a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

Additional information on the description of affected entities may be found in Chapter 3, and additional information on the expected economic effects of the proposed action may be found in Chapter 4.

Statement of Need for, Objectives of, and Legal Basis for the Action

The purpose and need of the proposed action are presented in Chapter 1. The purpose of this proposed action is to modify the stock boundary and revise the ACLs for Atlantic and Gulf migratory group king mackerel; to modify the commercial zone quotas for Gulf migratory king mackerel; to review recreational and commercial allocations for Gulf migratory king mackerel; to increase the recreational bag limit for Gulf migratory king mackerel; to create an incidental catch allowance of Atlantic migratory king mackerel for the shark gillnet fishery; and to revise or create management measures for Atlantic migratory group king mackerel in the Atlantic

Southern Zone. The need for this amendment is to ensure annual catch limits are based on the best scientific information available and to ensure overfishing does not occur in the coastal migratory pelagics (CMP) fishery, while increasing social and economic benefits of the CMP fishery through sustainable and profitable harvest of king mackerel in accordance with provisions set forth in the Magnuson-Stevens Fishery Conservation and Management Act.

The Magnuson-Stevens Fishery Conservation and Management Act provides the statutory basis for this proposed action.

Identification of All Relevant Federal Rules Which May Duplicate, Overlap or Conflict with the Proposed Action

No duplicative, overlapping, or conflicting Federal rules have been identified with this proposed action.

Description and Estimate of the Number of Small Entities to Which the Proposed Action will Apply

This proposed action is expected to directly affect federally permitted commercial fishermen fishing for king mackerel in the Gulf and Atlantic. Recreational anglers fishing for king mackerel would also be directly affected by the proposed action, but they are not considered business entities under the RFA. Charterboat and headboat operations are business entities but they are only indirectly affected by the proposed action. For RFA purposes only, NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR § 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including affiliates), and has combined annual receipts not in excess of $11 million for all its affiliated operations worldwide.

From 2000/2001 through 2013/2014 fishing years, an average of 274 vessels landed Gulf group king mackerel and generated dockside revenues (2014 dollars) of $3,987,671 from king mackerel, $1,935,219 from other species jointly landed with king mackerel, and $12,395,741 from all other species in trips where king mackerel was not caught. The average annual revenue per vessel from all species, including king mackerel, landed by these vessels was $66,952. During the same time period, an average of 736 vessels landed Atlantic group king mackerel, and generated dockside revenues (2014 dollars) of $5,842,731 from king mackerel, $1,888,830 from other species jointly landed with king mackerel, and $12,670,841 from all other species in trips where king mackerel was not caught. The average revenue per vessel from all species, including king mackerel, landed by these vessels was $27,817. Vessels that caught and landed black sea bass may also operate in other fisheries, the revenues of which are not known and are not reflected in these totals. Based on revenue information, all commercial vessels affected by the proposed action may be assumed to be small entities.

Description of the Projected Reporting, Record-keeping and other Compliance Requirements of the Proposed Action

In general, the proposed action would not introduce any changes to reporting and record-keeping and other compliance requirements which are currently required.

Substantial Number of Small Entities Criterion

All directly affected entities have been determined, for the purpose of this analysis, to be small entities. Therefore, the proposed action would affect a substantial number of small entities.

Significant Economic Impact Criterion

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

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

All entities that are expected to be affected by this proposed action are considered small entities, so the issue of disproportional effects on small versus large entities does not presently arise.

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

Action 1 would establish a single year-round boundary for separating the Gulf and Atlantic migratory groups of king mackerel at the Miami-Dade/Monroe county line, with the Gulf of Mexico Fishery Management Council (Gulf Council) being responsible for management measures in the mixing zone. This would replace the current boundary that varies seasonally, and thus would simplify management, avoid confusion, and likely streamline enforcement particularly that this new boundary designation would also coincide with the boundary designation for Gulf and Atlantic Spanish mackerel. This change would provide a good environment for commercial vessels to increase their revenues and profits, particularly for those vessels operating out of the Keys, but the extent of revenue increases would be largely shaped by the kind of fishing regulations that would be established. It is noted that the current 50-fish trip limit on the east coast of Florida during winter would be replaced by another trip limit as discussed in Action 5.

Action 2-1 would revise the ABC levels for Atlantic group king mackerel for 2016/17 through 2019/20 based on the ABC levels recommended by the SSC for ABC under a high recruitment scenario. This would substantially increase the ABC levels, and thus provide a highly favorable environment for large increases in potential harvest of king mackerel that may be expected to result in higher revenues and profits to participating commercial vessels.

Action 2-2 would revise the ACLs, commercial quotas, and recreational ACT based on the ABC levels selected under Action 2-1, for the Atlantic group king mackerel. ACL = OY = ABC, recreational ACT = [0.5 or (1-PSE), whichever is greater]. Given the substantial increase in ABC, equating ACL and OY to ABC would directly result in increasing the potential revenues from the harvest of Atlantic group king mackerel. The Northern and Southern Zone commercial

quotas would also be revised based on the selected ACL. Whether the full revenue potential for each zone would be realized largely depends on whether the full quotas would be taken. Using the highest past landings (2009/2010 landings) as the expected future landings, both zones are not expected to fully take their respective quotas. To an extent, this allows the possibility for further revenue increases in the future. This statement, however, is based on the current system of having only one full season, and could be qualified based on Action 4 that would split the season in the Southern Zone.

Action 3 would allow retention and sale of Atlantic king mackerel caught with gillnet as incidental catch in the gillnet portion of the commercial shark fishery for any vessel with a valid shark directed commercial permit and valid federal king mackerel commercial permit. The king mackerel must be sold to a dealer with the Southeast federal dealer permit. For this type of incidental catches and solely from the standpoint of revenues, no more than 2 king mackerel per crew member per trip in the Southern Zone may be sold and no more than 3 king mackerel per crew member per trip in the Northern Zone (except trips north of Cape Lookout Light, NC) may be sold. This change would allow affected vessels to generate revenues from their incidental catches instead of merely discarding them. There have only been few vessels and few trips that resulted incidental catches of king mackerel in the two zones so that the potential adverse impact on vessels that target king mackerel when incidental catches are counted against the commercial ACL would be negligible.

Action 4 would allocate the Atlantic Southern Zone quota for Atlantic king mackerel into two split season quotas: 60% to the period March 1 - September 30 (season 1) and 40% to the period October 1 – the end of February (season 2). Any remaining quota from season 1 would transfer to season 2. Any remaining quota from season 2 would not be carried forward. When the quota for the season is met or expected to be met, commercial harvest of king mackerel in the Atlantic Southern Zone will be prohibited for the remainder of the season. In general, the revenue effects of splitting the season as against not splitting the season are unclear. If quota closures occur early in the season when maintaining one season, the split-season alternative would allow commercial vessels to fish longer and likely generate higher overall revenues. In contrast, the split season may restrict harvest and revenues in the first season that may not be fully recouped in the second season. This could potentially happen when revenues from the relatively higher pricing conditions in the first season that coincides with the Lenten season would be restricted due to early closure in the first season. Landings may be higher in the second season, but if prices were low, the higher landings in the second season may not result in revenue levels that could fully recoup the forgone revenues in the first season. Given current available information on landings, even the highest past landings (2009/2010 landings), and the proposed quota increase, no quota closures would be expected for either the first or second season. Thus, this action would not be expected to adversely affect the revenues and profits of commercial vessels. Action 5 would establish a trip limit system for the Atlantic Southern Zone. For both the first and second seasons, the trip limit north of the Flagler/Volusia county line would be 3,500 lbs. South of the Flagler/Volusia county line, the trip limit for the first season would be 50 fish for the month of March, and 75 fish for the remainder of the first season but if 75 percent of the season's quota had been taken the trip limit would be 50 fish. For the second season, the trip limit would be 50 fish, and beginning on February 1 continuing through the end of February the trip limit would be 50 fish if 70 percent or more of the second season's quota had been taken, or

75 fish if less than 70 percent of the second season's quota had been taken. The 3,500 lb trip limit north of the Flagler/Volusia county line is the same as the current trip limit, and therefore vessels fishing in this area would remain unaffected. Given that no closures would be expected for the first or second season, as discussed in Action 4, the imposition of a trip limit would tend to reduce both revenues and profits of commercial vessels. However, the magnitude of revenue reductions would be relatively small when considering both the historical landings and the proposed quota increases.

Action 6 would set the Gulf migratory group king mackerel ACL equal to the ABC recommended by the Gulf Scientific and Statistical Committee (SSC) for 2015-2019. The ABC recommended by the SSC is lower than the existing ABC but the lower number is largely a product of the new information that Gulf migratory group king mackerel spans a smaller area than previously thought. When the existing commercial ACL is adjusted for landings that would no longer be considered part of the Gulf migratory group king mackerel, the new commercial ACLs for 2015-2019 would actually be higher than the existing ones. For this reason, Action 6 would be expected to provide potentially higher landings and revenues to commercial vessels. Historically, the commercial sector has fully harvested its allocation, thus using past landings as a predictor of future landings, it is likely that the commercial sector would fish out their allocations and thus generate higher revenues.

Action 7 would revise the commercial zone quotas for Gulf migratory group king mackerel as follows: 40% for the Western Zone; 18% for the Northern Zone; 21% for the Southern Zone Handline component; and 21% for the Southern Zone Gillnet component. This revised percent allocation by zone is necessitated by the fact that the previous allocation included the Florida East Coast as one of the zones for the Gulf migratory group king mackerel. The proposed boundary change under Action 1 would render this area part of the Southern Zone for the Atlantic migratory group king mackerel. Action 7 would result in quota increases to all the zones for the Gulf migratory group king mackerel, potentially resulting in higher revenues to commercial vessels. However, the quota increases would not be uniform across the zones, with Northern Zone receiving the largest quota increases.

Action 8 would have revised the recreational and commercial allocations for the Gulf migratory group of king mackerel, but because the Councils chose the no action alternative, no resulting changes in vessel revenues and profits would be expected.

Action 9 would modify the recreational bag limit for Gulf migratory group of king mackerel from two to three fish per person per day. This would not directly affect any business entities under the RFA.

Description of Significant Alternatives

Among the actions considered, only Action 5 may result in adverse economic impacts on small commercial business entities. However, all trip limit alternatives would be expected to adversely affect the revenues of commercial vessels, and the magnitude of differences among the alternatives cannot be estimated. It is noted that trip limits are expected to reinforce the intent of

splitting the fishing season so that fishermen can take advantage of the productive period in the late fall.

CHAPTER 7. LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED

Preparers:

Name	Expertise	Responsibility
Ryan Rindone, GMFMC	Fishery Biologist	Co-Team Lead – amendment development, introduction, biological and administrative impacts
Kari MacLauchlin, SAFMC	Fishery Social Scientist	Co-Team Lead – amendment development, introduction, social impacts
Susan Gerhart, NMFS	Fishery Biologist	Co-Team Lead – amendment development, introduction, biological, administrative and cumulative impacts
Karla Gore, NMFS/SF	Fishery Biologist	Co-Team Lead – amendment development, biological and administrative environments
Assane Diagne, GMFMC	Economist	Economic impacts
Brian Cheuvront, SAFMC	Economist	Economic impacts, regulatory impact review
Ava Lasseter, GMFMC	Anthropologist	Social impacts
Tony Lamberte, NMFS/SF	Economist	Economic environment and impacts, Regulatory Flexibility Act analysis
Christina Package-Ward, NMFS/SF	Anthropologist	Social environment
Mike Larkin, NMFS/SF	Data Analyst	Data analysis

Reviewers:

Name	Discipline/Expertise	Role in EA Preparation
Mara Levy, NOAA GC	Attorney	Legal review
Monica Smit-Brunello, NOAA GC	Attorney	Legal review
Noah Silverman, NMFS	Natural Resource Management Specialist	NEPA review
David Dale, NMFS/HC	EFH Specialist	Habitat review
Jennifer Lee, NMFS/PR	Protected Resources Specialist	Protected resources review
Christopher Liese	Economist	Social/economic review
John Walter	Research Fishery Biologist	Biological review

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

The following have or will be consulted:

National Marine Fisheries Service

- Southeast Fisheries Science Center
- Southeast Regional Office
- Protected Resources
- Habitat Conservation
- Sustainable Fisheries

NOAA General Counsel
Environmental Protection Agency
United States Coast Guard
Texas Parks and Wildlife Department
Alabama Department of Conservation and Natural Resources/Marine Resources Division
Louisiana Department of Wildlife and Fisheries
Mississippi Department of Marine Resources
Florida Fish and Wildlife Conservation Commission
Georgia Department of Natural Resources
South Carolina Department of Natural Resources
North Carolina Division of Marine Fisheries
Mid-Atlantic Fishery Management Council

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fishery of the Gulf of Mexico, spiny lobster fishery of the Gulf of Mexico and South Atlantic, coral and coral reefs of the Gulf of Mexico. Gulf of Mexico Fishery Management Council. Tampa, Florida. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/FINAL3_EFH_Amendment.pdf

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APPENDIX A. SUMMARIES OF PUBLIC COMMENTS RECEIVED

Gulf of Mexico Scoping Workshop Comments

SCOPING WORKSHOPS
Coastal Migratory Pelagics
Amendment 26
King Mackerel Allocations & Mixing Zone Delineation

Biloxi, Mississippi
March 31, 2015

Meeting Attendees:
Rufus Young

King Mackerel Annual Catch Limit

How should the Councils adjust the king mackerel annual catch limits in light of the recent adjustment to acceptable biological catch?

- The Council should raise the annual catch limit along with the acceptable biological catch. Anything to get a little back.

Should a constant catch scenario be considered in the Gulf?

- A declining trend is fine. The constant catch scenario not preferable because it doesn't allow for the most fish to be harvested.

Gulf King Mackerel Commercial Zone Allocations

How should the Gulf annual catch limit be allocated to the commercial zones?

- The Gulf CMP Advisory Panel suggestions are fine. 40% to the Western Zone, 18% to the Northern Zone, and 21% each to the Southern Zone components. The Northern Zone guys need to fish too.

Gulf King Mackerel Sector Allocation

Should the Gulf Council adjust the commercial and recreational allocations for king mackerel?

- There should be a hard shift of 10% of the allocation from the recreational to commercial sector. Anything to give the commercial side more and keep the season open longer.

Sale of King Mackerel Bycatch in the South Atlantic Shark Gillnet Fishery

Should the South Atlantic Council allow bag limit sale of king mackerel caught while shark gillnetting?

- Yes, let them sell the bag limit. No sense in throwing dead fish away.

How would allowing bag limit sale of king mackerel change fishing behavior?

- There shouldn't be any change in fishing behavior.

Recreational Bag Limit for King Mackerel

Should the Gulf Council consider increasing the recreational bag limit for king mackerel?

- No, and it will cause recreational fishermen to fish hard if they can get three fish.

Saint Petersburg, Florida
April 13, 2015

Meeting Attendees:
Richard Sergent
Stewart Hehenberger

King Mackerel Stock Boundary

How would adjustments to the stock boundary effect the fishery?

- The opening dates for the new zones would have to change to ensure the fish are in those areas when they're open.
- There are not a whole lot of fish caught during the winter in the east/north end of that mixing zone. Fish are mostly to the west and northeast at that time.
- The suggested boundary change seems reasonable.

Gulf King Mackerel Commercial Zone Allocations

How should the Gulf annual catch limit be allocated to the commercial zones?

- The increase should be spread it out evenly.
- Consider giving more quota to the panhandle area (Northern subzone of the Eastern zone) which doesn't have enough fish. Currently that area has such a

small portion of the fish that you can't even fish for king mackerel off of the St. Petersburg area because the panhandle fishermen catch the zone allocation up before the fish get there.
- Consider making a new fishing zone off St. Petersburg so the season can be open when the fish are around. Make the season for the Tampa zone open in March-May and maybe again in the fall.

Gulf King Mackerel Sector Allocation

Should the Gulf Council adjust the commercial and recreational allocations for king mackerel?

- The fish that are under harvested by the recreational sector should be given to the commercial sector.

Sale of King Mackerel Bycatch in the South Atlantic Shark Gillnet Fishery

Should the South Atlantic Council allow bag limit sale of king mackerel caught while shark gillnetting?

- No, those fishermen are shark fishing. Gillnets were banned off the Atlantic coast for a reason and harvest of king mackerel with that gear type should not be encouraged.

Florida East Coast Subzone Management

Should the South Atlantic consider creating a sub-quota or endorsement for king mackerel fishing in the Florida East Coast Subzone?

- Effort increase is a concern in that area but limiting entry in some way could be bad. There is fear that a qualifying year or number of landings will be chosen and fishermen currently fishing in that area will be excluded.
- There should not be an endorsement required to fish in the Florida East Coast subzone.

Recreational Bag Limit for King Mackerel

Should the Gulf Council consider increasing the recreational bag limit for king mackerel?

- The recreational bag limit should not increase. A 2-fish per person bag limit is plenty of meat.

Key West, Florida
April 19, 2015

Meeting Attendees:
George Niles
Daniel Padron
Bill Kelly

King Mackerel Annual Catch Limit

How should the Councils adjust the king mackerel annual catch limits in light of the recent adjustment to acceptable biological catch?

- Council's should evaluate the ABC annually.
- The Gulf Council should have more authority over the fishery than the South Atlantic Council.
- The SSC should reevaluate the ABC.

King Mackerel Stock Boundary

How would adjustments to the stock boundary effect the fishery?

- The proposed mixing zone is fine.

Gulf King Mackerel Sector Allocation

Should the Gulf Council adjust the commercial and recreational allocations for king mackerel?

- There has to be some way to use the fish that aren't being harvested.
- Recreational fish already go against commercial quota because they can sell the fish they catch.
- Give the commercial fishermen quota from the recreational sector until the recreational sector is landing 80% of its quota.
- The three million pounds of fish being left in the water by the recreational sector is not being caught, and using a "use it or lose it" for a million of those pounds over 5 years doesn't make sense.

How should the king mackerel annual catch limit be allocated?

- The recreational sector should lend portion of their quota to commercial sector because they're not using it and fish are being wasted. Try lending program for a year and see how it works.
- Attendees in favor of proportional allocation, where the Western Zone would get 45.53%; the Northern Zone, 7.61%; and each component of the Southern Zone, 23.43%.

- The allocation in the northern areas doesn't make sense. Those areas were never where the heart of the fishery was.

Sale of King Mackerel Bycatch in the South Atlantic Shark Gillnet Fishery

How would allowing bag limit sale of king mackerel change fishing behavior?

- It will not change the way people fish.
- A three fish limit will benefit those who are able to sell the incidentally caught fish.

Florida East Coast Subzone Management

Should the South Atlantic consider creating a sub-quota or endorsement for king mackerel fishing in the Florida East Coast Subzone?

- There is not a lot of support for this idea, the system already too complicated.
- This may cause more people would jump into fishery.
- If it's done the Councils need to build in a sunset provision.
- The two-for-one provision that was brought up at South Atlantic AP was brought up, however, not much support from attendees.
- A sub-quota may affect the after-market in a negative way.

Recreational Bag Limit for King Mackerel

Should the Gulf Council consider increasing the recreational bag limit for king mackerel?

- The recreational sector does not need a three fish bag limit.
- Try a recreational bag limit increase for 1-2 years.
- Give an extra 2,000,000 pounds to the commercial sector instead.
- Rather than decreasing the recreational allocation, the Council needs to make it feasible for people to fish.

How would increasing the recreational bag limit for king mackerel change fishing behavior?

- Behavior will change if recreational fishermen are allowed to sell their fish. Charter boats will definitely fish for kingfish more in this case.

Galveston, Texas
April 27, 2015

Meeting Attendees:
Shane Cantrell

King Mackerel Annual Catch Limit

How should the Councils adjust the king mackerel annual catch limits in light of the recent

adjustment to acceptable biological catch?

- Since the annual catch limit has not been harvested in recent years there is no need to raise it now.
- Keep status quo for three years to see how it works, reconsider an adjustment if we begin see a change in landings.

Should a constant catch scenario be considered in the Gulf?

- Yes. This would provide predictability in season length for the commercial zones.

King Mackerel Stock Boundary

What should the Councils do regarding the stock assessment recommendation on creating a mixing zone?

- The Council should follow the scientific advice and create a mixing zone.

How would adjustments to the stock boundary effect the fishery?

- Adjustments will have no effect.

Gulf King Mackerel Commercial Zone Allocations

How should the Gulf annual catch limit be allocated to the commercial zones?

- The Council should follow the Gulf CMP advisory panel recommendation. 40% for the Western Zone, 18% for the Northern Zone, and 21% each for the Southern Zone handline and gillnet components.

Gulf King Mackerel Sector Allocation

Should the Gulf Council adjust the commercial and recreational allocations for king mackerel?

- More recreational input is needed before a decision on allocation is made. We should have more information on why the recreational sector isn't harvesting their allocation. They shouldn't necessarily be penalized for under harvesting.

How should the king mackerel annual catch limit be allocated?

- A bag limit analysis and research on mortality rate of king mackerel releases should be performed to inform this decision.

Sale of King Mackerel Bycatch in the South Atlantic Shark Gillnet Fishery

Should the South Atlantic Council allow bag limit sale of king mackerel caught while shark gillnetting?

- Yes. There is no reason to discard dead fish, especially if they have dockside value.

How would allowing bag limit sale of king mackerel change fishing behavior?

- There will be no change.

Florida East Coast Subzone Management

Should the South Atlantic consider creating a sub-quota or endorsement for king mackerel fishing in the Florida East Coast Subzone?

- There should be a sub-quota rather than an endorsement to fish in the Florida East Coast Subzone.

Should specific accountability measures be established in the Florida East Coast Subzone?

- Yes. Effort over there seems to be an issue for the South Atlantic, so they will probably want to look at specific things over there.

Recreational Bag Limit for King Mackerel

Should the Gulf Council consider increasing the recreational bag limit for king mackerel?

- Yes. We need to do everything we can to help the recreational fishermen catch their allocation. Maybe this will help them land more fish.

How would increasing the recreational bag limit for king mackerel change fishing behavior?

- Depends on individual, but generally there will be changes in behavior with a larger bag limit. The for-hire group would keep extra fish.

Grand Isle, Louisiana
April 28, 2015

Meeting Attendees:
Dean Blanchard
Kelty Readenour
Michael Frazier
Abigail Frazier
Brian Hardcastle

King Mackerel Annual Catch Limit

How should the Councils adjust the king mackerel annual catch limits in light of the recent adjustment to acceptable biological catch?

- The maximum possible ACL is preferred as long as it does not cause overfishing.

Should a constant catch scenario be considered in the Gulf?

- Council should follow the advisory panel suggestion and select a constant catch scenario.

King Mackerel Stock Boundary

What should the Councils do regarding the stock assessment recommendation on creating a mixing zone?

- The mixing zone should be created if it makes sense scientifically. There would be no effect on the fishery.

Gulf King Mackerel Zone Allocations

How should the Gulf annual catch limit be allocated to the commercial zones?

- Locals don't have a chance to fish in the Western zone with so many traveling fishermen coming from different areas. The advisory panel's recommendation of 41% allocation for the western Gulf should be considered.

Sector Reallocation of Gulf King Mackerel

Should the Gulf Council adjust the commercial and recreational allocations for king mackerel?

- Do not move recreational allocation to commercial sector. You don't want to mess with those guys, or you'll never hear the end of it.

Sale of King Mackerel Bycatch in the Shark Gillnet Fishery

Should the South Atlantic Council allow bag limit sale of king mackerel caught while shark gillnetting?

- Yes, as long as it is monitored.

Management for the Florida East Coast Subzone

Should the South Atlantic consider creating a sub-quota or endorsement for king mackerel fishing in the Florida East Coast Subzone?

- Follow the advisory panel recommendation. This is largely a South Atlantic issue, so the South Atlantic Council should decide.

Recreational Bag Limit for King Mackerel

Should the Gulf Council consider increasing the recreational bag limit for king mackerel?

- Yes. Do something to see if they can catch their fish. If not, then reallocate fish to the commercial sector.

How would increasing the recreational bag limit for king mackerel change fishing behavior?

- Fishing behavior won't change by a measurable amount.

Gulf Public Hearing Comments

Corpus Christi, Texas
February 22, 2016

Council/Staff
Greg Stunz
Emily Muehlstein
Charlotte Schiaffo

1 member of the public attended.

Mike Miglini – Commercial Fisherman
He would like the western zone for king mackerel to open on June 1.

Pascagoula, Mississippi
February 22, 2016

Council/Staff
Dale Diaz
Ryan Rindone
Karen Hoak

No members of the public attended.

Texas City, Texas
February 23, 2016

Council/Staff
Doug Boyd
Emily Muehlstein
Charlotte Schiaffo

6 members of the public attended.

Buddy Guindon – Commercial Fisherman

For Action 1, which addresses the mixing zone, ***the current preferred Alternative 3 benefits the Gulf the most.*** For Action 7, it's hard to distribute specific quotas in the zones because pressure would change. Consider making people declare a zone but, grandfather in the guys that are currently traveling. We should make fishermen pick a zone and stay with it. It seems like a punishment that the Atlantic people come the Gulf to fish. It would likely make the fishery

easier if there were less traveling fishermen. ***In Action 8, it not necessary to reallocate at the moment; he supports No Action***. For Action 9, he believes that the recreational fishermen should have the opportunity to catch their fish. The Councils should raise the limit to whatever it takes to ensure they harvest their share.

Bubba Cochrane – Commercial Fisherman

He supports the preferred Alternative 3 in Action 1. Give the mixing zone to the Gulf Council. Reallocating fish from the recreational sector isn't a good idea. ***He supports Action 8, Alternative 1- No Action.*** Let recreational fishermen harvest their fish by ***increasing the bag limit to 4 fish in Action 9***.

Johnny Walker – Commercial Fisherman

For Action 9, increase the recreational bag limit to 4 fish (Alternative 3) and allow them to catch their fish. Let the South Atlantic make their own regulations.

Bill Wright – Commercial Fisherman

For Action 8, he supports the No Action Alternative; keep the current recreational and commercial allocation as is. ***In Action 9, increase the recreational bag limit***.

Orange Beach, Alabama
February 23, 2016

Council/Staff
Johnny Greene
Ryan Rindone
Karen Hoak

No members of the public attended.

Kenner, Louisiana
February 24, 2016

Council/Staff
Myron Fisher
Emily Muehlstein
Charlotte Schiaffo

1 member of the public attended. No comments were given.

Destin, Florida
February 24, 2016

Council/Staff
Pam Dana
Ryan Rindone
Karen Hoak

10 members of the public attended.

Jack Conzelman – Commercial Fisherman

Gulf Southern Zone kingfish fishermen historically didn't fish the Gulf Northern Zone. When the commercial zone allocations were being decided, a representative for the Florida Keys commercial fishermen brought a number of Gulf Southern Zone kingfish fishermen to the Gulf Council meeting, arguing that the historical fishermen were all from the Gulf Southern Zone and that the fishermen in the Gulf Northern Zone were all part-time kingfish fishermen. This resulted in the current commercial zone allocations for kingfish, which unfairly discounted the historical landings from the Gulf Northern Zone fishermen.

The Gulf Northern Zone needs to be allocated more of the commercial ACL. The current ACL could be caught by traveling fishermen alone in only a few weeks. ***I prefer Alternative 2 in Action 6 and Alternative 4 in Action 7***. Also, with the October opening of the Gulf Northern Zone, fishermen in that zone can find kingfish into December.

Jeff Lassiter – Commercial Fisherman

We need more fish in the Gulf Northern Zone to deal with the traveling fishermen problem. ***I prefer Alternative 2 in Action 6, Alternative 4 in Action 7, and Alternative 1 in Action 9***.

Mike Whitfield – Commercial Fisherman, Gulf CMP Advisory Panel Member

We need to divorce management of king mackerel from the South Atlantic Council. We also need to limit the number of zones in which commercial fishermen can fish for king mackerel. ***I prefer Alternative 2 in Action 6, Alternative 4 in Action 7, and Alternative 1 in Action 8***.

Joseph Krawczynski – Commercial Fisherman

I prefer Alternative 4 in Action 7.

Austin Golden – Commercial and Charter Fisherman

King mackerel make up a large component of my annual income. Changing the start date of the season opening to October 1st for the Gulf Northern Zone has been great for charter guys, but not so great for commercial guys. The commercial kingfish fishermen are still struggling to deal

with the traveling fishermen. Increasing the Gulf Northern Zone quota would help everybody. ***I prefer Alternative 2 in Action 6, Alternative 4 in Action 7, and Alternative 1 in Action 8***.

Mark Kelley – Commercial and Charter Fisherman

Undersized king mackerel are being wasted when they are released dead or near dead. We should have some provision which lets us keep those fish if they are just going to die. We don't want to waste the resource. ***I prefer Alternative 2 in Action 6, Alternative 4 in Action 7, Alternative 1 in Action 8, and Alternative 1 in Action 9***.

Johnathan Akins – Commercial and Charter Fisherman

The October 1st opening in the Gulf Northern Zone helped the dually permitted kingfish fishermen. ***I prefer Alternative 2 in Action 6, Alternative 4 in Action 7, and Alternative 1 in Action 8***.

Key West, Florida
February 29, 2016

Council/Staff
John Sanchez
Ryan Rindone
Emily Muehlstein

8 members of the public attended.

George Niles- Commercial Fisherman (**spoke on behalf of everyone in attendance**).

For Action 1 the fishermen support the preferred Alternative 3. They are in favor of changing the Gulf jurisdiction to the Dade/Monroe county line. It would solve many problems like not being able to net fish in the South Atlantic.

For Action 3, the Mackerel Advisory Panel did discuss the shark boats keeping bycatch. Similarly, the Spanish mackerel fishery in the Gulf catches a by catch of kingfish and the Advisory Panel asked to be allowed to retain a recreational bag limit similar to this request in Action 3. He would like to see that provision included in a future amendment.

Regarding Action 6, there are 40 million pounds of recreational fish left over from the past 15 years of under-fishing the annual catch limit. Despite that huge surplus the ABC continues to ratchet down. There should be an annual review of the ABC and ACL because this decline should not happen. ***The fishermen support the Action 6, Alternative 2 rather than a constant catch***.

In Action 7 the Northern Zone should not have a 200% quota increase. There used to only be two zones but, because the Southern Zone kept reaching their quota, they allowed the Northern

Zone to have their own quota. Now, the Northern Zone wants more and it doesn't make sense. The Mackerel Advisory Panel only has two representatives from the Southern Zone, and that is why the motion to increase the Northern Zone quota passed. ***The fishermen support Alternative 3 in Action 7***.

For Action 8 the fishermen support Alternative 3 and either sub-option is fine. It is silly to leave fish in the water so we should do what we can to catch what we're allowed. The recreational sector hasn't complained that they don't have enough fish. He was told by recreational members of the Advisory Panel, 10 years ago, that they don't really need more kingfish.

In Action 9 the fishermen support Alternative 2. The study showed this would possibly increase mortality less than 20% and the recreational sector would still under fish their ACL. This also serves as evidence that the allocation shift is appropriate.

The makeup of the Mackerel AP needs to be addressed. It's unbelievable that the zone with the most fish has the least representation. It seems like there should be proportional membership on the AP from each component of the fishery.

Mr. Niles spoke for these members of the audience:
William Roche
Santiago Arencibia Jr.
Carlos Arencibia
Frank Arencibia

Webinar
March 3, 2016

Council/Staff
Emily Muehlstein
Bernie Roy

1 member of the public attended. Comments were submitted for the yellowtail snapper framework.

Summary of Written Comments
March 30, 2016
Comments received since the June 2015 Council meeting

- The king mackerel commercial quota should not be reallocated because landings data is not incorporated into the decision.
- The southern zone is not fairly represented on the Advisory Panel.
- Commercial king mackerel quota increases should be distributed equally among the regions.

South Atlantic Scoping Comments

The South Atlantic Council held scoping for items in Amendment 26 in January 2015. One in-person scoping meeting was held on January 21, 2015, in Cocoa Beach, FL, with 16 individuals providing public comment on the record. A scoping webinar for Amendment 26 was held on February 4, 2015. There were 12 individuals (plus staff) logged onto the webinar but only one individual provided comments on the record. Additionally, three written comments were received.

- Six commenters noted the abundance of small fish and high recruitment, and supported setting the ACL at the highest level possible (high recruitment ABC).
- Two commenters supported the medium recruitment ABC.
- One commenter felt that the OFL should be much higher due to high recruitment during several non-hurricane years.
- One commenter recommended allowing unused quota to be rolled over to the next year.
- One commenter was concerned about how lack of information about the dynamics of stock mixing in SEDAR 38
- Five commenters supported updating the stock boundary and mixing zone.
- Nine commenters and several discussion participants were concerned with how the Northern and Southern Zone quotas (set up in Amendment 20B) would work with the new stock boundary and ACLs for king mackerel. Some individuals did not support a separate Northern Zone quota.
- Several commenters and discussion participants were concerned that the Florida East Coast subzone quota would be moved to the other Gulf zones or be allocated to the Northern Zone quota.
- One commenter felt that the Gulf Eastern Zone/Northern Subzone should have the largest proportion of the Gulf ACL, because it has the largest number of participants and potential new entrants. There should be split seasons with a 500-lb trip limit from Apr 1- Sept 30, and a 1250-lb trip limit with a step-down in November for Oct 1- Mar 31.
- Six commenters supported allowing bag limit sales of king mackerel in the shark gillnet fishery. One commenter recommended that this should only be allowed if it can be strictly enforced so that only a small number (bag limit) can be sold.
- Twelve commenters were opposed to an endorsement to fish king mackerel in the Florida East Coast subzone, because if endorsements are set up in other zones/subzones, this would affect the traveling fishermen. Some commenters also felt that an endorsement would be a step toward catch shares and they were opposed to catch shares.
- One commenter supported a subquota for the Florida East Coast subzone.
- One commenter recommended moving the Florida East Coast subzone boundary south of the Flagler/Volusia line.
- One commenter recommended waiting until the new ACLs are in place before addressing management in the Florida East Coast subzone.
- One commenter recommended changing the fishing year for the Florida East Coast subzone to March 1.

South Atlantic Public Hearing Comments

This summary includes comments received at the public hearing in Cocoa Beach on February 3, 2016, on the webinar hearing on February 8, 2016, and one written comment from Directed Sustainable Fisheries on behalf of king mackerel industry stakeholders.

Overall:
- Set the ACL = ABC under high recruitment
- There are lots of small fish; all age classes and high recruitment period
- Have a March 1 opening with 75-fish trip limit
- Support for the split season for the Southern Zone
- Increased allocation for the Gulf Northern Zone (panhandle)
- Concerns about the king mackerel gillnet sector in the Keys

Action 1: stock boundary
- Three comments in support of Preferred Alternative 3.

Action 2-1 and 2-2: Atlantic king mackerel ABC and ACL
- Several commenters supported setting the ACL= ABC under the high recruitment. The stock is not overfished and overfishing is not occurring. The fishermen report that there are lots of small fish and that the way the Council is specifying recruitment [as not in a high period] is incorrect.

Action 3: incidental catch allowance for shark gillnets
- The written comment supported the preferred alternative.

Action 4: split season quotas for the Southern Zone
- Many commenters supported the opening date of March 1 for season 1.
- Some commenters supported split season quotas under Alternative 2 (60/40) or with 70/30 split seasons.

Action 5: trip limits for the Southern Zone
- Several commenters supported Alternative 2 and Alternative 4/Option 4a as the preferred alternatives. This would set the season 1 trip limit at 75 fish with no step-down, and the season 2 trip limit at 50 fish with a possible step-up in February.
- One commenter supported 75 fish in season 2 with a step-down to 50 fish.
- One commenter raised concern about not having the 3500-lb trip limit in Volusia in season 1, because of the year-round boundary proposed at the Flagler/Volusia line.

Action 6: Gulf king mackerel ACL
- The written comment supported the preferred alternative.
- A few commenters voiced concern that the Gulf ACL is being set to the ABC, and it was unfair that the Atlantic ACL would not also be set to the ABC.

Action 7: Gulf commercial zone quotas
- Several commenters supported a larger allocation for the Gulf Northern Zone, because the zone has always had a small allocation and there should be more quota in the zone to support a longer season.
- Several commenters voiced concern that the Southern Zone Gillnet allocation was unfair, and that the gillnets should be phased out.
- The written comment supported Alternative 4 as the preferred.

Action 8: Gulf recreational and commercial allocations
- One commenter supported moving some recreational ACL to the commercial ACL.
- The written comment supported Alternative 4/Option 4a/Option 4e as the preferred alternative and options.

Action 9: Gulf bag limit
-The written comment supported Alternative 2 (three fish/day) as the preferred.

Other comments
- NMFS should work with fishermen to get data on the small fish, or bring back small fish under an EFP.
- Allow bag limit sales for king and Spanish mackerel caught on charter trips.
- Allow electronic reporting for the commercial sector.
- Do not separate the FMPs- each Council serves as a check-and-balance for the other.
- Concerns about environmental factors affecting king mackerel, including upwellings and pollution

APPENDIX B. ALTERNATIVES CONSIDERED BUT REJECTED

Action 2-2
Alternative 6: Establish ACL = OY = 80% ABC based on the ABC levels selected under Action 2-1.

The South Atlantic Council removed this alternative in September 2015 and the Gulf Council removed the alternative in October 2015. The Councils felt that the 80% buffer was not necessary for the Atlantic king mackerel ACL.

Action 3
Alternative 3: Allow retention and sale of Atlantic migratory group king mackerel caught with gillnet as incidental catch in the drift gillnet portion of the commercial shark fishery for any vessel with a valid shark directed commercial permit AND valid federal king mackerel commercial permit. The king mackerel must be sold to a dealer with the Southeast federal dealer permit.

> **Option a:** For shark gillnet trips in the South Atlantic, no more than 100 lbs of king mackerel can be on board, and no more than 100 lbs of king mackerel can be sold from the trip. **(South Atlantic CMP AP Preferred)**
> **Option b:** For shark gillnet trips in the South Atlantic, no more than 100 lbs of king mackerel can be on board, and no more than 100 lbs of king mackerel can be sold from the trip.

The Councils removed this alternative from consideration in June 2015. The Councils preferred to have alternatives with numbers of fish instead of pounds of fish because it would help compliance and enforcement. Additionally, depending on the mesh size being used, specification of a maximum poundage that could be on board and sold could vary on each trip.

Action 5-1. Establish Boundaries for the Florida East Coast Management Zone for Atlantic Migratory Group King Mackerel

Alternative 1: No action - Do not establish a Florida east coast management zone.

Alternative 2: Establish a Florida east coast management zone that exists year-round with boundaries at:
Option 2a: Flagler/Volusia county line and Dade/Monroe county line.
Option 2b: Volusia/Brevard county line and Dade/Monroe county line.
Option 2c: Volusia/Brevard county line and the Council jurisdictional boundary (as designated Action 1).

Alternative 3: Establish a Florida east coast management zone that exists for season 1 (as designated in Action 4) with boundaries at:
Option 3a: Flagler/Volusia county line and Dade/Monroe county line.

Option 3b: Volusia/Brevard county line and Dade/Monroe county line. **(Gulf AP and South Atlantic AP Recommended)**
Option 3c: Volusia/Brevard county line and the Council jurisdictional boundary (as designated in Action 1).

Alternative 4: Establish a Florida east coast management zone that exists for season 2 (as designated in Action 4) with boundaries at:
Option 4a: Flagler/Volusia county line and Dade/Monroe county line. **(Gulf AP and South Atlantic AP Recommended)**
Option 4b: Volusia/Brevard county line and Dade/Monroe county line.
Option 4c: Volusia/Brevard county line and the Council jurisdictional boundary (as designated in Action 1).
Action 5-2. Establish a trip limit system for the Florida East Coast Management Zone

Option 3a. Reduce the trip limit to 50 fish from May 1- May 31.
Option 3b. Reduce the trip limit to 50 fish from May 1- August 31.
Option 3c. Reduce the trip limit to 50 fish from April 15- May 15.

The Councils decided to remove this action after public input indicated that the additional complexity of the shifting boundary was not necessary to establish trip limits. The trip limits for the Atlantic Southern Zone are now included in Action 5.

APPENDIX C. RECREATIONAL KING MACKEREL BAG LIMIT ANALYSIS FOR THE GULF OF MEXICO

The Gulf of Mexico Fishery Management Council requested analysis of increasing the king mackerel bag limit from 2 to 3 fish per angler at their March 2015 meeting. This analysis also includes an increase to 4 fish per angler, to provide a range of alternatives should this action be added to an amendment. This action may be added to Amendment 26 to the Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and South Atlantic Region or developed as a framework amendment.

First, Gulf of Mexico recreational datasets from Marine Recreational Fisheries Statistical Survey (MRFSS), Headboat, and Texas Parks and Wildlife Department (TPWD) were explored to determine the numbers of king mackerel harvested per angler. Data from the most recent years of complete data (2011-2013) were used. Figure 1 provides the distribution of the number of king mackerel harvested per angler.

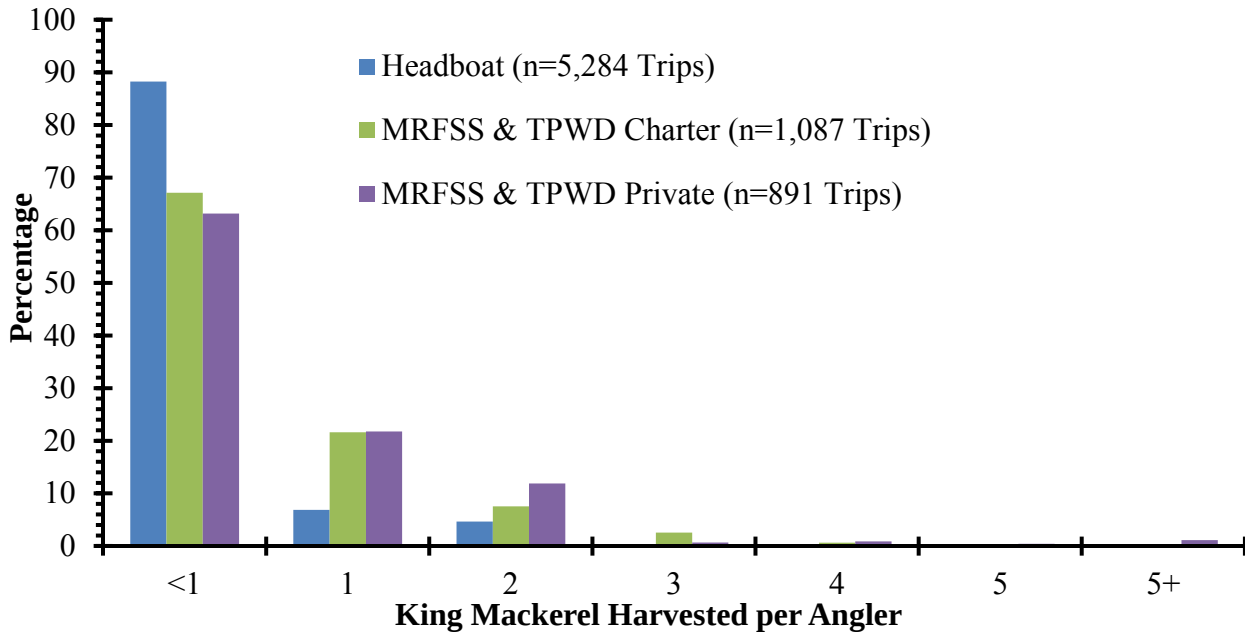

Figure 1. Distribution of Gulf of Mexico king mackerel harvested per angler by mode from the three recreational datasets (MRFSS, Headboat, and TPWD). The data used are from 2011 through 2013.

Since the current bag limit is two king mackerel per angler, the possibility exists that king mackerel may be discarded after the bag limit is met on a trip. This was explored by first isolating the trips that met or exceeded the bag limit. Only 7% (n=513 trips) of the total trips from 2011-2013 met or exceeded the 2-fish bag limit. The number of discards per angler on trips that met or exceeded the bag limit were plotted in Figure 2. However, discards are not recorded

in the TPWD survey so it is unknown how many king mackerel were discarded in Texas waters. TPWD accounted for 22% (n=114 trips) of the 513 trips that met or exceeded the trip limit.

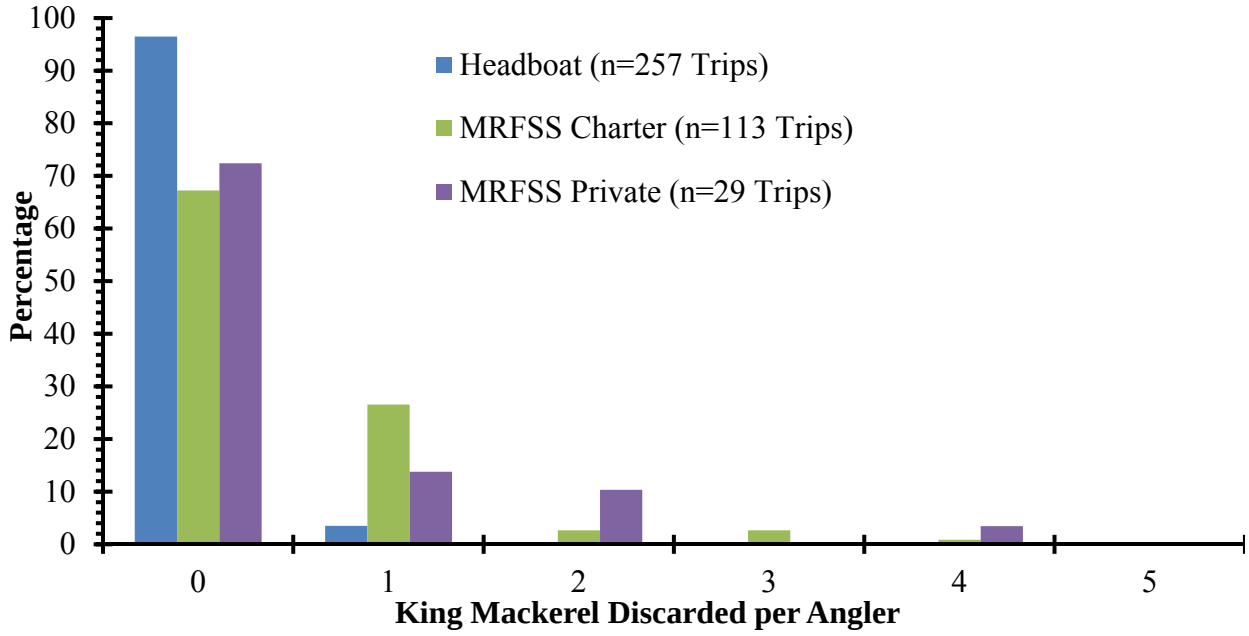

Figure 2. Distribution of Gulf of Mexico king mackerel discarded per angler by mode from MRFSS and Headboat data. TPWD data are not included because no discard information is collect in the TPWD survey. The data used are from 2011 through 2013.

Increases from 2 to 3 fish and from 2 to 4 fish were analyzed with two different methods that modified the trips that met the 2 fish per angler bag limit. Trips that harvested less than 2 fish per angler or more than 2 fish per angler were not modified. The first of the two methods assumed that all trips that met the 2 fish per angler bag limit would also meet the 3 and 4 fish per angler bag limit. The second method isolated the trips that met the 2 fish bag limit and assumed they met the 3 and 4 fish bag limit if those trips also had discards of 1 or 2 king mackerel, respectively. For example, a trip that met the 2 fish bag limit and had at least two discarded king mackerel was analyzed by assuming 4 king mackerel (2 harvested fish plus the 2 discarded fish) were harvested for that trip. It must be noted that the second method assumes discarded king mackerel were only discarded because the trip limit was met. However, these discards could have been because these fish were below the minimum size limit of 24 inches fork length. The length of the discarded fish is not available so it is not possible to distinguish if the discards were because the fish was below the minimum size. The calculated percent increase in landings by mode are shown in Table 1.

Table 1. Calculated percent increase in Gulf of Mexico king mackerel recreational landings from increasing the bag limit. Percent increase in landings was calculated by mode for two different methods. Method 1 assumes all the trips that met the 2 fish bag limit would also meet the 3 or 4 fish per angler bag limit. Method 2 isolated the trips that met the 2 fish bag limit and allowed them to meet the 3 and 4 fish bag limit if these trips also had discarded king mackerel. Analysis for TPWD was not possible because discards are not recorded in the TPWD survey.

Bag Limit	MRFSS		TPWD		Headboat
	Charter	Private	Charter	Private	
Method 1					
2 to 3 Fish	7%	11%	6%	14%	13%
2 to 4 Fish	17%	22%	11%	28%	27%
Method 2					
2 to 3 Fish	1%	1%	NA	NA	<1%
2 to 4 Fish	2%	4%	NA	NA	<1%

An overall percent increase in recreational landings was calculated by weighting the percent increase for each mode by the percentage of landings that mode contributed to the overall recreational landings. The pounds and percentage of king mackerel recreational landings for each mode from 2011 to 2013 are shown in Table 2. The overall percent increase is shown in Table 3.

Table 2. Gulf of Mexico king mackerel landings by mode from 2011 to 2013. The landings are in pounds whole weight (lbs) and percent of the total landings.

Mode	Landings (lbs)	Percent
MRFSS charter	2,543,217	27%
MRFSS private	6,157,548	64%
TPWD charter	25,797	0%
TPWD private	292,286	3%
Headboat	567,549	6%
Total	9,586,397	100%

Table 3. Percent increase in Gulf of Mexico king mackerel recreational landings generated from data for the years 2011 to 2013. The percent increase estimates were calculated by weighting the increase in the bag limit for each mode (Table 1). The weighting was based on the percentage of landings each mode contributed to the overall landings from 2011 to 2013 (Table 2).

Bag Limit	Method 1	Method 2
2 to 3 Fish	10.1%	0.9%
2 to 4 Fish	21.1%	3.1%

This analysis attempted to predict realistic changes to king mackerel recreational landings by applying increases to the current 2-fish bag limit. Uncertainty exists in these projections, as economic conditions, weather events, changes in catch-per-unit effort, fisher response to management regulations, and a variety of other factors may cause departures from this assumption. The bounds of this uncertainty are not captured by the analysis as currently configured; as such, it should be used with caution as a 'best guess' for future dynamics. In addition to the aforementioned sources of uncertainty, the predicted increase in landings associated with bag limit options assume past performance in the fishery is a good predictor of future dynamics. The analysis constrained the range of data considered to recent years to reduce the unreliability of this assumption.

APPENDIX D. OTHER APPLICABLE LAW

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for fishery management in federal waters of the Exclusive Economic Zone. However, fishery 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 National Environmental Policy Act (sections throughout the document), Endangered Species Act (Section 3.3.2), Marine Mammal Protection Act (Section 3.3.2), E.O. 12866 (Regulatory Planning and Review, Chapter 5) and E.O. 12898 (Environmental Justice, Section 3.5.4). Other applicable laws are summarized below.

Administrative Procedure Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, 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 APA also establishes a 30-day waiting period from the time a final rule is published until it takes effect.

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 C.F.R. 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. Florida is the only state affected by this action.

Upon submission to the Secretary of Commerce, NMFS will determine if this amendment is consistent with the Coastal Zone Management program of Gulf and Atlantic states 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 each state.

Data Quality Act

The Data Quality Act (DQA) (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 DQA 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 fishery management plans (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 DQA, 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.

Executive Orders

E.O. 12630: Takings

The Executive Order 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. 13132: Federalism

The Executive Order on Federalism requires agencies in formulating and implementing policies, to be guided by the fundamental Federalism principles. The Order 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 Order 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 have been identified relative to the action proposed in this amendment. Therefore, consultation with state officials under Executive Order 12612 is not necessary.

APPENDIX E. EXPECTED NORTHERN AND SOUTHERN ZONE ALLOCATIONS WITH THE SEDAR 38 STOCK BOUNDARY

Kari MacLauchlin, SAFMC Staff
April 2015

In CMP Amendment 20B, the South Atlantic Council established commercial king mackerel quotas for a Northern and Southern Zone. The boundary between the zones is the NC/SC boundary. The allocations of the commercial ACL that would go to each zone were based on a time period selected in CMP Amendment 20B. This document provides details of how the Northern and Southern zone quotas for Atlantic king mackerel will be set up under the SEDAR 38 stock boundary.

Following the approach used in SEDAR 38, landings in Table E-1 and Figure E-1 from the [new] mixing zone from November 1- March 31 are counted as 50% Atlantic and 50% Gulf; and landings from the [new] mixing zone from April 1- October 31 are counted as Atlantic. The fishing year for Atlantic king mackerel is March 1- February 28/29.

Commercial and Recreational Landings

Table E-1. Recreational landings estimates (blue) and total commercial landings (red) of Atlantic king mackerel from 2002-03 through 2013-14. Data sources: SEFSC/MRIP/SEDAR 38.

	Commercial Landings (lbs)			**Recreational Landings (lbs)**
Fishing Year	Northern Zone	Southern Zone	**TOTAL Commercial**	
2002-03	777,749	2,102,493	2,880,242	4,572,182
2003-04	594,870	2,181,464	2,776,334	5,484,156
2004-05	1,046,857	2,622,305	3,669,162	5,354,585
2005-06	1,156,465	2,021,140	3,177,605	3,962,532
2006-07	1,204,659	2,825,673	4,030,332	5,410,425
2007-08	1,112,270	2,709,845	3,822,115	7,134,876
2008-09	953,736	3,359,877	4,313,613	4,154,875
2009-10	786,060	4,087,983	4,874,043	4,212,935
2010-11	294,281	4,255,278	4,549,559	2,636,250
2011-12	433,295	2,817,705	3,251,000	1,835,817
2012-13	345,175	2,029,643	2,374,818	1,802,805
2013-14	1,489,016	373,427	1,862,443	1,035,006

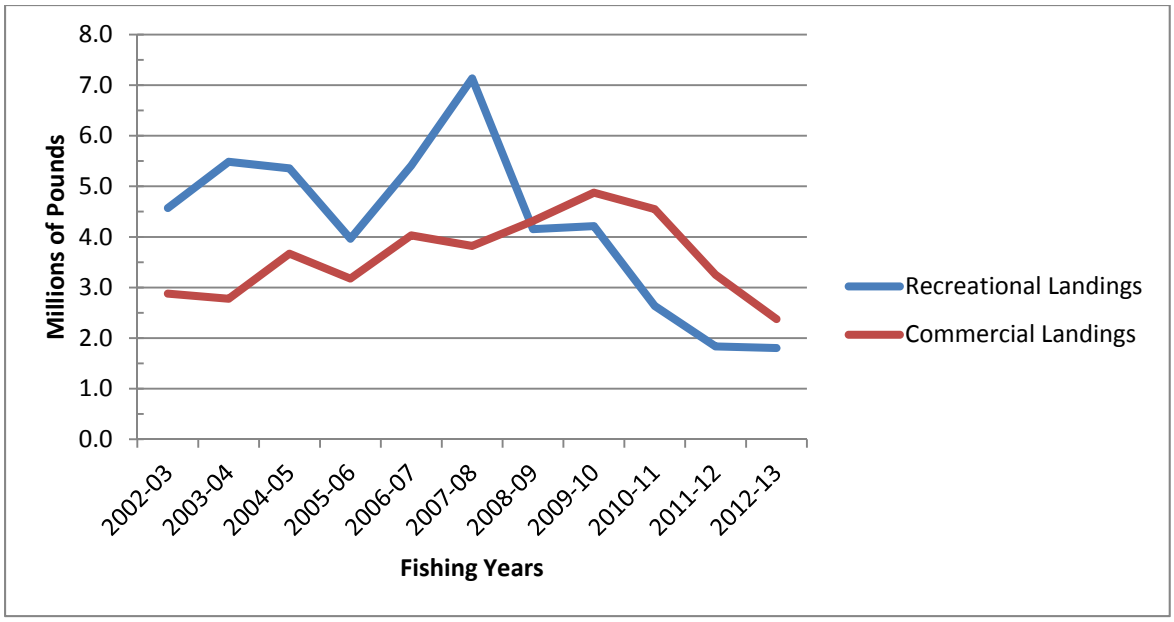

Figure A-1. Recreational landings estimates (blue) and total commercial landings (red) of Atlantic king mackerel from 2002-03 through 2013-14. Data sources: SEFSC/MRIP/SEDAR 38.

Recalculating Northern and Southern Zone Quotas

In Action 4.1 in Amendment 20B (Establish Regional Commercial Quotas for Atlantic Migratory Group King Mackerel), the Councils selected the following alternative as the Preferred:

Preferred Alternative 3: Establish quotas for Northern and Southern Zones for Atlantic migratory group king mackerel based on **Options a-d** below. The Northern Zone would include the EEZ off states from North Carolina north to New York. The Southern Zone would include the EEZ off South Carolina, Georgia, and the east coast of Florida. NMFS would monitor landings in both zones and close the EEZ of each zone when the respective quota is reached.

Preferred Option b: Each zone quota would be the Atlantic migratory group ACL times the average of the proportion of landings in that zone from 2002/2003 through 2011/2012.

For Amendment 26, the expected percentage of the quota for each zone was re-calculated using the same time period as specified in Amendment 20B, but with landings that would be counted as Atlantic king mackerel using the stock boundary and mixing zone from SEDAR 38 (Table E-1). The expected percentages will be:

Northern Zone - 23.04% **Southern Zone - 76.96%**

Northern Zone landings = Atlantic king mackerel landings north of the NC/SC boundary (North Carolina + Mid-Atlantic landings).

Southern Zone landings = Atlantic king mackerel landings south of the NC/SC boundary to the

Dade/Monroe county line + Atlantic KM landings in the [new] mixing zone landings from April 1 through October 31 + 50% of Atlantic KM landings in the [new] mixing zone from November 1through March 31.

Table E-2 shows how landings would be counted as Atlantic king mackerel landings under the SEDAR 38 stock boundary and mixing zone. Following the approach used in SEDAR 38, landings from the [new] mixing zone from November 1- March 31 are counted as 50% Atlantic and 50% Gulf; and landings from the [new] mixing zone from April 1- October 31 are counted as 100% Atlantic. The fishing year for Atlantic king mackerel is March 1- February 28/29.

The landings data for the [new] mixing zone are confidential and cannot be shown separately from other Florida landings.

Table E-2. Commercial landings of Atlantic king mackerel in the Northern and Southern Zones using the SEDAR 38 approach to designating landings in the [new] mixing zone as 100% Atlantic stock from April 1 – October 31; and 50% of landings in the [new mixing zone] from November 1 - March 31 and landings in the Florida East Coast subzone November 1 - March 31 as Atlantic stock. Proportion of total landings is shown for each year, in addition to the average proportion of total landings for each Zone from 2002-03 through 2011-12. Data source: SEFSC and SEDAR 38.

	Commercial Landings of Atlantic King Mackerel (lbs)			**Proportion of Total Landings**	
Fishing Year	Northern Zone (NC and Mid-Atl)	Southern Zone (SC, GA, FL, new mixing zone)	**TOTAL** Landings	Northern Zone	Southern Zone
2002-03	777,749	2,102,493	2,880,242	27.00%	73.00%
2003-04	594,870	2,181,464	2,776,334	21.43%	78.57%
2004-05	1,046,857	2,622,305	3,669,162	28.53%	71.47%
2005-06	1,156,465	2,021,140	3,177,605	36.39%	63.61%
2006-07	1,204,659	2,825,673	4,030,332	29.89%	70.11%
2007-08	1,112,270	2,709,845	3,822,115	29.10%	70.90%
2008-09	953,736	3,359,877	4,313,613	22.11%	77.89%
2009-10	786,060	4,087,983	4,874,043	16.13%	83.87%
2010-11	294,281	4,255,278	4,549,559	6.47%	93.53%
2011-12	433,295	2,817,705	3,251,000	13.33%	86.67%
			AVERAGE:	23.04%	76.96%

APPENDIX F. BYCATCH PRACTICABILITY ANALYSIS (BPA)

Population Effects for the Bycatch Species

Background
In the Gulf of Mexico (Gulf) and Atlantic (Florida through New York) regions, most king mackerel and cobia are harvested with hook and line gear; however, gillnets and castnets are the predominant gear type used to harvest Spanish mackerel.

Commercial Sector
Currently, discard data are collected using a supplemental form that is sent to a 20% stratified random sample of the active permit holders in CMP fishery. However, in the absence of any observer data, there are concerns about the accuracy of logbook data in collecting bycatch information. Biases associated with logbooks primarily result from inaccuracy in reporting of species that are caught in large numbers or are of little economic interest (particularly of bycatch species), and from low compliance rates. During 2010-2014, the commercial sector for CMP species in both the Gulf and Atlantic landed 10,685,747 lbs and discarded 9,107 lbs (Table 1) per year. The commercial sector predominantly harvested king and Spanish mackerel, with relatively few cobia (Table 1).

Recreational Sector
For the recreational sector, during 2010-2014, estimates of the number of recreational discards were available from Marine Recreational Information Program (MRIP) and the National Marine Fisheries Service (NMFS) headboat survey. The MRIP system classifies recreational catch into three categories:

- Type A - Fishes that were caught, landed whole, and available for identification and enumeration by the interviewers.
- Type B - Fishes that were caught but were either not kept or not available for identification:
    - Type B1 - Fishes that were caught and filleted, released dead, given away, or disposed of in some way other than Types A or B2.
    - Type B2 - Fishes that were caught and released alive.

During 2010-2014, the private recreational landings and discards for all three CMP species were higher than for either the headboat or charter boat category (Table 1). Spanish and king mackerel had the highest landings and cobia had the highest discards relative to the landings.

During 2010-2014, information for charter trips came from two sources. Charter vessels for the CMP fishery were selected to report by the Science and Research Director (SRD) to maintain a fishing record for each trip, or a portion of such trips as specified by the SRD, and on forms

provided by the SRD. Harvest and bycatch information was monitored by MRIP. Since 2000, a 10% sample of charter vessel captains were called weekly to obtain trip level information, such as date, fishing location, target species, etc. In addition, the standard dockside intercept data were collected from charter vessels and charter vessel clients were sampled through the standard random digital dialing of coastal households. Precision of charter vessel effort estimates has improved by more than 50% due to these changes (Van Voorhees et al. 2000).

Harvest from headboats was monitored by NMFS at the Southeast Fisheries Science Center's (SEFSC) Beaufort Laboratory. Collection of discard data began in 2004. Daily catch records (trip records) were filled out by the headboat operators, or in some cases by NMFS-approved headboat samplers based on personal communication with the captain or crew. Headboat trips were subsampled for data on species lengths and weights. Biological samples (scales, otoliths, spines, reproductive tissues, and stomachs) were obtained as time allowed. Lengths of discarded fish were occasionally obtained but these data were not part of the headboat database.

Recent improvements have been made to the recreational survey of MRIP, formerly called Marine Recreational Fisheries Statistics Survey. Beginning in 2013, samples were drawn from a known universe of fishermen rather than randomly dialing coastal households. Other improvements have been and will be made that should result in better estimating recreational catches and the variances around those catch estimates.

Table 1. Annual mean Headboat, MRIP, and commercial estimates of landings and discards in the Gulf of Mexico and U.S. Atlantic Ocean (Florida to New York) during 2010-2014. Headboat, MRIP (charter and private) landings are in numbers of fish (N); commercial landings are in pounds (lbs). Discards represent numbers of fish that were caught and released alive (B2).

	HEADBOAT				MRIP CHARTER				MRIP PRIVATE				COMMERCIAL		
	Catch (N)	Landings (N)	Discards (N)	Percent Discards	Catch (N)	Landings (N)	Discards (N)	Percent Discards	Catch (N)	Landings (N)	Discards (N)	Percent Discards	Landings (lbs ww)	Discards (N)	Percent Discards
Cobia	3,795	2,404	1,391	37%	17,666	10,150	7,516	43%	157,814	66,291	91,523	58%	226,411	0	0%
King Mackerel	27,141	25,498	1,643	6%	150,869	131,008	19,861	13%	348,595	239,425	109,170	31%	5,445,986	7,945	<1
Spanish Mackerel	12,611	11,500	1,111	9%	384,353	282,737	101,616	26%	2,069,184	1,095,230	973,954	47%	5,013,350	1,162	<1%
Total	**43,548**	**39,402**	**4,146**		**552,888**	**423,895**	**128,993**		**2,575,593**	**1,400,946**	**1,174,647**		**10,685,747**	**9,107**	

Sources: MRIP data from SEFSC Recreational ACL Dataset (March 2016); Headboat data from SEFSC Headboat Logbook CRNF files (expanded; March 2016); Commercial landings data from SEFSC Commercial ACL Dataset (December 2015) with discard estimates from expanded SEFSC Commercial Discard Logbook (April 2016);
Notes: Commercial discard estimates are for vertical line gear only. Commercial king mackerel includes "king and cero mackerel" category;
Estimates of commercial discards are highly uncertain; No reported discards for Commercial and Headboat Cobia;
King mackerel, cobia, and Spanish mackerel data include both Atlantic coast and Gulf of Mexico. Note that discard estimates for commercial and headboat include only the Gulf of Mexico and SAFMC jurisdiction; discards from the Mid-Atlantic would likely be relatively low, but are not reported here

Finfish Bycatch Mortality
Release mortality rates are unknown for most managed species. Recent Southeast Data, Assessment, and Review (SEDAR) assessments include estimates of release mortality rates based on published studies. Stock assessment reports can be found at http://www.sefsc.noaa.gov/sedar/.

SEDAR 28 (2013a, 2013b, 2013c, 2013d) assessed Spanish mackerel and cobia stocks in the South Atlantic and Gulf. The stocks were determined to be neither overfished nor undergoing overfishing. Both the Gulf and Atlantic migratory groups of king mackerel were assessed by SEDAR 16 in 2008/2009 (SEDAR 16 2009), and assessed again by SEDAR 38 in 2014. The SEDAR 38 (2014) assessment determined the Gulf migratory group of king mackerel was not overfished and not experiencing overfishing. The Atlantic migratory group king mackerel was also assessed in SEDAR 38 and determined not to be overfished and not experiencing overfishing.

For Spanish mackerel, SEDAR 17 (2008) used the following discard mortality rates: gillnets 100%, shrimp trawls 100%, trolling 98%, hook-and-line 80%, and trolling/hook-and-line combined 88%. SEDAR 28 (2013c, 2013d) recommended identical discard mortality for Spanish mackerel as 100% for gillnets and shrimp trawls, but recommended a 10% discard mortality rate for commercial handlines, and 20% for recreational handlines. For cobia, SEDAR 28 (2013a and 2013b) used a discard mortality rate of 5% for the hook-and-line gear (both commercial and recreational sectors), and 51% for gillnets. SEDAR 38 provided estimates of release mortality for king mackerel of 20% for the private and charter sectors, 22% release mortality for the headboat sector, 25% release mortality for commercial hooked gear fisheries, and 100% for trawl by-catch for both the Gulf and Atlantic. Most king mackerel and cobia are harvested using hook-and-line gear, and gillnets are the primary gear for Spanish mackerel. As shown in Table 1, discards in the commercial sector are relatively low for all three CMP species, and while discards of cobia in the private recreational sector are very high, the discard mortality rate is very low for this species using hook-and-line gear (SEDAR 28, 2013a and 2013b).

Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality
According to the bycatch information for mackerel gillnets, menhaden, smooth dogfish sharks, and spiny dogfish sharks were the three most frequently discarded species (SAFMC 2004). There were no interactions of sea turtles or marine mammals reported (Poffenberger 2004). The Southeast Region Current Bycatch Priorities and Implementation Plan FY04 and FY05 reported that 26 species of fish are caught as bycatch in the Gulf king mackerel gillnet sector. Of these, 34% are reported to be released dead, 59% released alive, and 6% undetermined. Bycatch was not reported for the Gulf Spanish mackerel sector. The Atlantic Spanish mackerel portion of the CMP fishery has 51 species reported as bycatch with approximately 81% reported as released alive. For the South Atlantic king mackerel portion of the CMP fishery 92.7% are reported as released alive with 6% undetermined. Bycatch was not reported separately for gillnets and hook-and-line gear. Additionally, the supplementary discard program to the logbook reporting requirement shows no interactions of gillnet gear with marine mammals or birds.

Tables 2, 3, and 4 list the species most often caught with king and Spanish mackerel in the Gulf and South Atlantic from the SEFSC commercial logbook. There is very little bycatch in the Spanish mackerel component of the fishery with gillnet gear, and the king mackerel component is also associated with a low level of bycatch. Amendment 20B would not modify the gear types or fishing techniques in the mackerel segments of the CMP fishery. Therefore, bycatch and subsequent bycatch mortality in the CMP fishery is likely to remain very low if this amendment is implemented.

Additional information on fishery related actions from the past, present, and future considerations can be found in Section 4.10 (Cumulative Effects) of Amendment 26.

Table 2. Top six species caught on trips where at least one pound of Spanish mackerel was caught with gillnet gear in the Gulf of Mexico and South Atlantic for 2010 and 2014.

Species	Percent of Harvest (Gillnets Only)
Spanish mackerel	71.1%
Bluefish	12.9%
Atlantic Sharpnose Shark	4.3%
Blacktip Shark	1.5%
King mackerel & Cero	1.4%
Blue runner	1.0%
Croaker	0.8%

Source: Southeast Fisheries Science Center Commercial Logbook (April 2016)

Table 3. Top three species caught on trips where at least one pound of Spanish mackerel was caught with all gear types in the Gulf of Mexico and South Atlantic from 2010-2014.

Species	Percent of Harvest (All Gear Types)
Spanish mackerel	65.4%
King mackerel & Cero	14.1%
Bluefish	5.2%
Atlantic Sharpnose Shark	2.0%

Source: Southeast Fisheries Science Center Commercial Logbook (April 2016)

Table 4. Top 10 species caught on trips where at least one pound of king-cero mackerel with all gear types in the Gulf of Mexico and in the South Atlantic from 2010-2014.

Species	Percent of Total Harvest
King mackerel & Cero	63.5%
Vermilion snapper	7.3%
Red snapper	3.9%
Little tunny	3.9%
Yellowtail snapper	2.7%
Red grouper	2.6%
Spanish mackerel	2.0%
Atlantic sharpnose shark	1.5%
Red porgy	1.3%
Greater amberjack	1.1%
Croaker	1.1%

Source: Southeast Fisheries Science Center Commercial Logbook (April 2016)

Ecological Effects Due to Changes in the Bycatch

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. The Gulf Council, South Atlantic Council, and NMFS are in the process of developing actions that would improve bycatch monitoring in all fisheries including the CMP fishery. For example, the Joint South Atlantic/Gulf of Mexico Generic Charter/Headboat Reporting in the South Atlantic Amendment (Charter/Headboat Amendment), which became effective on January 7, 2014, requires weekly electronic reporting of landings and bycatch data for headboats in the South Atlantic. A similar framework action to require electronic reporting of landings and bycatch by headboats in the Gulf became effective on March 5, 2014. A generic amendment that requires weekly electronic reporting of commercial landings by dealers in the Gulf and South Atlantic became effective on August 7, 2014. The Gulf and South Atlantic Councils are developing amendments that would require electronic reporting of commercial logbook data, which would include landed and discarded fish. Better bycatch and discard data would provide a better understanding of the composition and magnitude of catch and bycatch, enhance the quality of data provided for stock assessments, increase the quality of assessment output, provide better estimates of interactions with protected species, and lead to better decisions regarding additional measures to reduce bycatch. Management measures that affect gear and effort for a target species can influence fishing mortality in other species. Therefore, enhanced catch and bycatch monitoring would provide better data that could be used in multi-species assessments.

Ecosystem interactions among CMP species in the marine environment are poorly known. The three species are migratory, interacting in various combinations of species groups at different levels on a seasonal basis. With the current state of knowledge, it is difficult to evaluate the potential ecosystem-wide impacts of these species interactions, or the ecosystem impacts from the limited mortality estimated to occur from mackerel fishing effort. However, there is very

little bycatch in the Spanish mackerel portion of the CMP fishery with gillnet gear, and the king mackerel portion of the CMP fishery is also associated with a low level of bycatch (Tables 2, 3, and 4). Amendment 26 would not modify the gear types or fishing techniques in the CMP fishery. Therefore, ecological effects due to changes in bycatch in the CMP fishery are likely to remain very low if implemented. For more details on ecological effects, see Chapters 3 and 4 of the amendment.

Changes in the Bycatch of Other Fish Species and Resulting Population and Ecosystem Effects

Actions in Amendment 26 are not expected to affect bycatch of other non-mackerel fish species. Only a small percentage of total landings in the mackerel and cobia components of the CMP fishery are non-targeted species (Tables 2, 3, and 4**)**.

Effects on Marine Mammals and Birds

Under Section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. The 2014 List of Fisheries classifies the Gulf and South Atlantic coastal migratory pelagic hook-and-line fishery as a Category III fishery (79 FR 14418, March 14, 2014). Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities. The Gulf and South Atlantic coastal migratory pelagic gillnet portion of the CMP fishery is classified as Category II fishery. This classification indicates an occasional incidental mortality or serious injury of a marine mammal stock resulting from the fishery (1-50 % annually of the potential biological removal). The gillnet portion of the CMP fishery has no documented interaction with marine mammals; NMFS classifies gillnet portion of the CMP fishery as Category II based on analogy (similar risk to marine mammals) with other gillnet fisheries.

The Bermuda petrel and roseate tern occur within the action area. Bermuda petrels are occasionally seen in the waters of the Gulf Stream off the coasts of North Carolina and South Carolina during the summer. Sightings are considered rare and only occurring in low numbers (Alsop 2001). Roseate terns occur widely along the Atlantic coast during the summer but in the southeast region, they are found mainly off the Florida Keys (unpublished USFWS data). Interaction with fisheries has not been reported as a concern for either of these species.

Fishing effort reductions have the potential to reduce the amount of interactions between the fishery and marine mammals and birds. Although, the Bermuda petrel and roseate tern occur within the action area, these species are not commonly found and neither has been described as associating with vessels or having had interactions with the CMP fishery. Thus, it is believed that the CMP fishery is not likely to negatively affect the Bermuda petrel and the roseate tern.

Spanish mackerel are among the species targeted with gillnet in North Carolina state waters. Observer coverage for gillnet is up to 10% and provided by the North Carolina Division of Marine Fisheries, primarily during the fall flounder fishery in Pamlico Sound. Gillnets are also

used from the North Carolina/South Carolina border and south and east of the fishery management council demarcation line between the Atlantic Ocean and the Gulf of Mexico. In this area gillnets are used to target finfish including, but not limited to king mackerel, Spanish mackerel, whiting, bluefish, pompano, spot, croaker, little tunny, bonita, jack crevalle, cobia, and striped mullet. The majority of fishing effort occurs in federal waters because South Carolina, Georgia, and Florida prohibit the use of gillnets, with limited exceptions, in state waters.

There is some observer coverage of CMP targeted trips by vessels with an active directed shark permit. The Shark Gillnet Observer Program is mandated under the Atlantic Highly Migratory Species FMP, the Atlantic Large Whale Take Reduction Plan (50 CFR Part 229.32), and the Biological Opinion for the Continued Authorization of the Atlantic Shark Fishery under Section 7 of the Endangered Species Act. Observers are deployed on any active fishing vessel reporting shark drift gillnet effort. In 2005, this program also began to observe sink gillnet fishing for sharks along the southeastern U.S. coast.

The shark gillnet observer program now covers all anchored (sink, stab, set), strike, or drift gillnet fishing by vessels that fish from Florida to North Carolina year-round. The observed fleet includes vessels with an active directed shark permit and fish with sink gillnet gear.

Changes in Fishing, Processing, Disposal, and Marketing Costs

It is likely that all states within the Gulf and South Atlantic Councils' jurisdictions would be affected by the regulations associated with actions in Amendment 26. However, the methods of fishing, processing, disposal, and marketing are not expected to change.

Both Councils are considering options to enhance current data collection programs in future amendments. This might provide more insight in calculating the changes in fishing, processing, disposal, and marketing costs. See Chapter 4 for a complete description of how the CMP fishery and the species would be impacted by the proposed actions.

Changes in Research, Administration, and Enforcement Costs and Management Effectiveness

All actions in Amendment 26 would affect some measure of change in research, administration, and enforcement costs and management effectiveness. See Chapter 4 of this amendment for more details.

Research and monitoring is ongoing to understand the effectiveness of proposed management measures and their effect on bycatch. In 1990, the SEFSC initiated a logbook program for vessels with federal permits in the snapper grouper fishery from the Gulf of Mexico and South Atlantic. In 1999, logbook reporting was initiated for vessels catching king and Spanish mackerel (Gulf and South Atlantic Councils). The Dolphin and Wahoo FMP required logbook reporting by fishermen with Commercial Atlantic Dolphin/Wahoo Permits. Approximately 20% of commercial fishermen from snapper grouper, dolphin wahoo, and CMP fisheries are asked to fill out discard information in logbooks; however, a greater percentage of fishermen could be

selected with emphasis on individuals that dominate landings. Recreational discards are obtained from the MRIP and logbooks from the NMFS headboat program.

The Charter/Headboat Amendment, which became effective on January 7, 2014, requires electronic reporting for headboats each week for the snapper grouper, dolphin wahoo, and CMP fisheries in the Atlantic. A similar amendment became effective on March 5, 2014 to require weekly electronic reporting for headboats for the reef fish and CMP fisheries in the Gulf. Some observer information for the snapper grouper fishery has been provided by the SEFSC, Marine Fisheries Initiative, and Cooperative Research Programs (CRP), but more is desired for the snapper grouper, dolphin wahoo, reef fish, and CMP fisheries. An observer program is in place for headboats in the southeast for the snapper grouper, reef fish, dolphin wahoo, and CMP fisheries. Observers in the NMFS Headboat survey collect information about numbers and total weight of individual species caught, total number of passengers, total number of anglers, location fished (identified to a 10 mile by 10 mile grid), trip duration (half, ¾, full or multiday trip), species caught, and numbers of released fish with their disposition (dead or alive). The headboat survey does not collect information on encounters with protected species. At the September 2012 South Atlantic Council meeting, the SEFSC indicated that observers are placed on about 2% of the headboat trips out of South Carolina to Florida, and about 9% of the headboat trips out of North Carolina (http://www.safmc.net/LinkClick.aspx?fileticket=XGaVZzxLePY%3d&tabid=745).

Cooperative research projects between science and industry are being used to a limited extent to collect bycatch information from fisheries in the Gulf and South Atlantic. Research funds for observer programs, and gear testing and testing of electronic devices are also available each year in the form of grants from the Gulf and South Atlantic Foundation, Marine Fisheries Initiative, Saltonstall-Kennedy program, and the CRP. Efforts are made to emphasize the need for observer and logbook data in requests for proposals issued by granting agencies. A condition of funding for these projects is that data are made available to the Councils and NMFS upon completion of a study.

Stranding networks have been established in the Southeast Region. The NMFS SEFSC is the base for the Southeast United States Marine Mammal Stranding Program (http://sero.nmfs.noaa.gov/pr/strandings.htm). NMFS authorizes organizations and volunteers under the MMPA to respond to marine mammal stranding events throughout the United States. These organizations form the stranding network whose participants are trained to respond to, and collect samples from live and dead marine mammals that strand along southeastern United State beaches. The SEFSC is responsible for: coordinating stranding events; monitoring stranding rates; monitoring human caused mortalities; maintaining a stranding database for the southeast region; and conducting investigations to determine the cause of unusual stranding events including mass stranding events and mass mortalities (http://www.sefsc.noaa.gov/species/mammals/strandings.htm).

The Southeast Regional Office and the SEFSC participate in a wide range of training and outreach activities to communicate bycatch related issues. The NMFS Southeast Regional Office issues public announcements, Southeast Fishery Bulletins, or News Releases on different topics, including use of turtle exclusion devices, bycatch reduction devices, use of methods and

devices to minimize harm to turtles and sawfish, information intended to reduce harm and interactions with marine mammals, and other methods to reduce bycatch for the convenience of constituents in the southern United States. These are mailed out to various organizations, government entities, commercial interests and recreational groups. This information is also included in newsletters and publications that are produced by NMFS and the various regional fishery management councils. Announcements and news releases are also available on the internet and broadcasted over NOAA weather radio.

Additional administrative and enforcement efforts would help to implement and enforce fishery regulations. The NMFS established the South East Fishery-Independent Survey in 2010 to strengthen fishery-independent sampling efforts in southeast U.S. waters, addressing both immediate and long-term fishery-independent data needs, with an overarching goal of improving fishery-independent data utility for stock assessments. Meeting these data needs is critical to improving scientific advice to the management process, ensuring overfishing does not occur, and successfully rebuilding overfished stocks on schedule.

Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources

Proposed management measures, and any changes in economic, social, or cultural values are discussed in Chapter 4 of Amendment 26. Further analysis can be found in Chapter 5 (Regulatory Impact Review) and Chapter 6 (Regulatory Flexibility Act Analysis) of the amendment.

Changes in the Distribution of Benefits and Costs

The distribution of benefits and costs expected from actions in Amendment 26 are discussed in Chapters 4, 5, and 6 of the amendment.

Social Effects

The social effects of all the measures are described in detail in Chapter 4 of Amendment 26.

Conclusion

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality using the ten factors provided at 50 CFR 600.350(d)(3)(i). In summary, measures proposed in Amendment 26 address issues associated with the new stock assessment for king mackerel in the Gulf and South Atlantic. None of the actions in this amendment are expected to significantly increase or decrease the magnitude of bycatch or bycatch mortality in the CMP fishery. Both sectors of the CMP fishery have relatively low baseline levels of bycatch, which are not expected to change as a result of implementation of this amendment. No additional action is needed to further minimize bycatch in the CMP fishery.

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APPENDIX G. SOUTH ATLANTIC KING MACKEREL ANALYSIS FOR COASTAL MIGRATORY PELAGICS AMENDMENT 26, ACTION 2, 4 AND 5

Prepared by SERO LAPP Division, December 2015
Revised in February 2016

Coastal Migratory Pelagics Amendment 26 (CMP 26) provides a range of ACLs, split seasons, and trip limits for South Atlantic king mackerel. These management changes were analyzed by obtaining Atlantic king mackerel landings and logbook data from the Southeast Fisheries Science Center. The landings and logbook include all commercial king mackerel landings from Maine through Miami-Dade county Florida.

The monthly king mackerel landings from 2009 through 2015 are variable. The highest landings occurred in the 2009 and 2010, and the lowest landings occurred in the recent years of 2013 and 2014 (**Figure 1**).

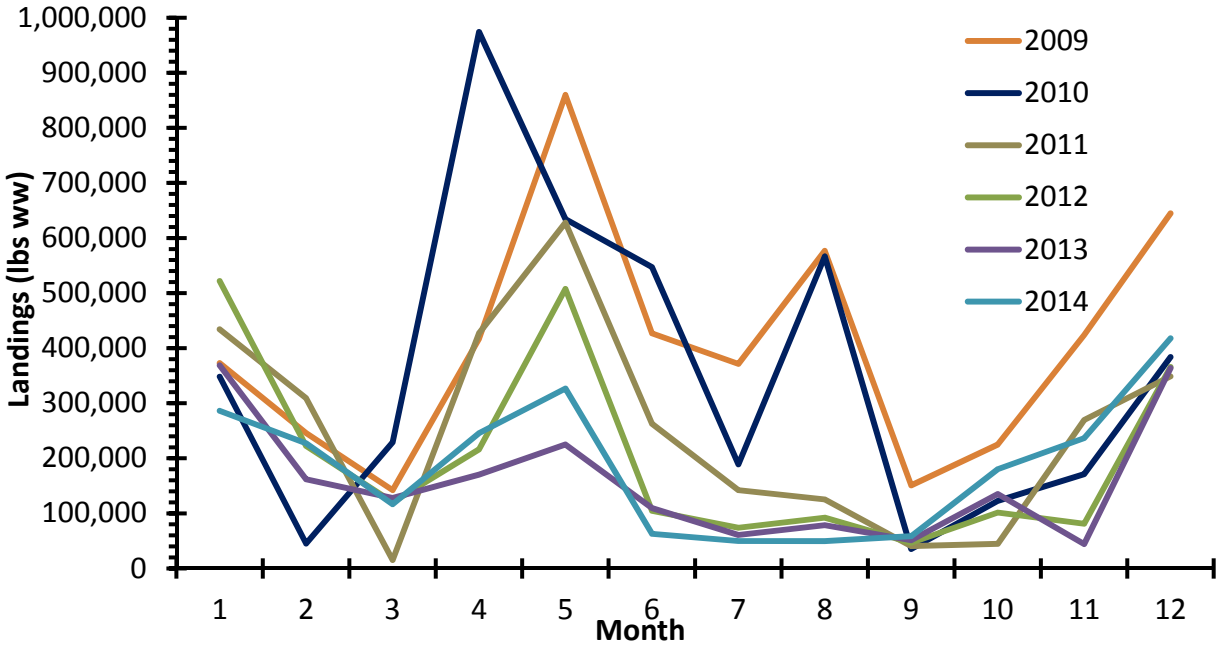

Figure 1. Atlantic king mackerel commercial landings by month from 2009 through 2014. Landings are in pounds whole weight (lbs ww).

Three different landings scenarios were used in the analysis to account for the variability in annual landings. The landings scenarios followed the current fishing season of March to February, and the scenarios are 1) 2009/2010 landings to reflect the maximum landings, 2) 2013/2014 landings to reflect the minimum landings, and 3) average landings from 2009/2010 through 2013/2014 to represent the recent average landings. If there was a closure the landings were modified. This was done by first determining the daily catch rate when the fishery was open, and then multiplying the catch rate against the number of days closed. For example, the maximum landings (2009/2010 landings) were modified because from the Flagler/Volusia

county line south to Miami-Dade/Monroe county line was only open from March 1st through March 6th of 2009. The catch rate per day was calculated for March 1st through March 6th of 2009 then multiplied against twenty-five to account for the twenty-five days the fishery was closed in March of 2009. The open fishery landings (March 1 through 6) were added to the predicted closed fishery landings (March 7 through 31) then added to the other open area landings (New York to Flagler County, Florida) to determine the total landings in March. The landings were also separated into the Northern zone (New York through North Carolina) and the Southern Zone (South Carolina through the Dade/Monroe county line in Florida) to reflect the zoning being considered in CMP 26. **Figure 2** displays the three different landings scenarios for each zone.

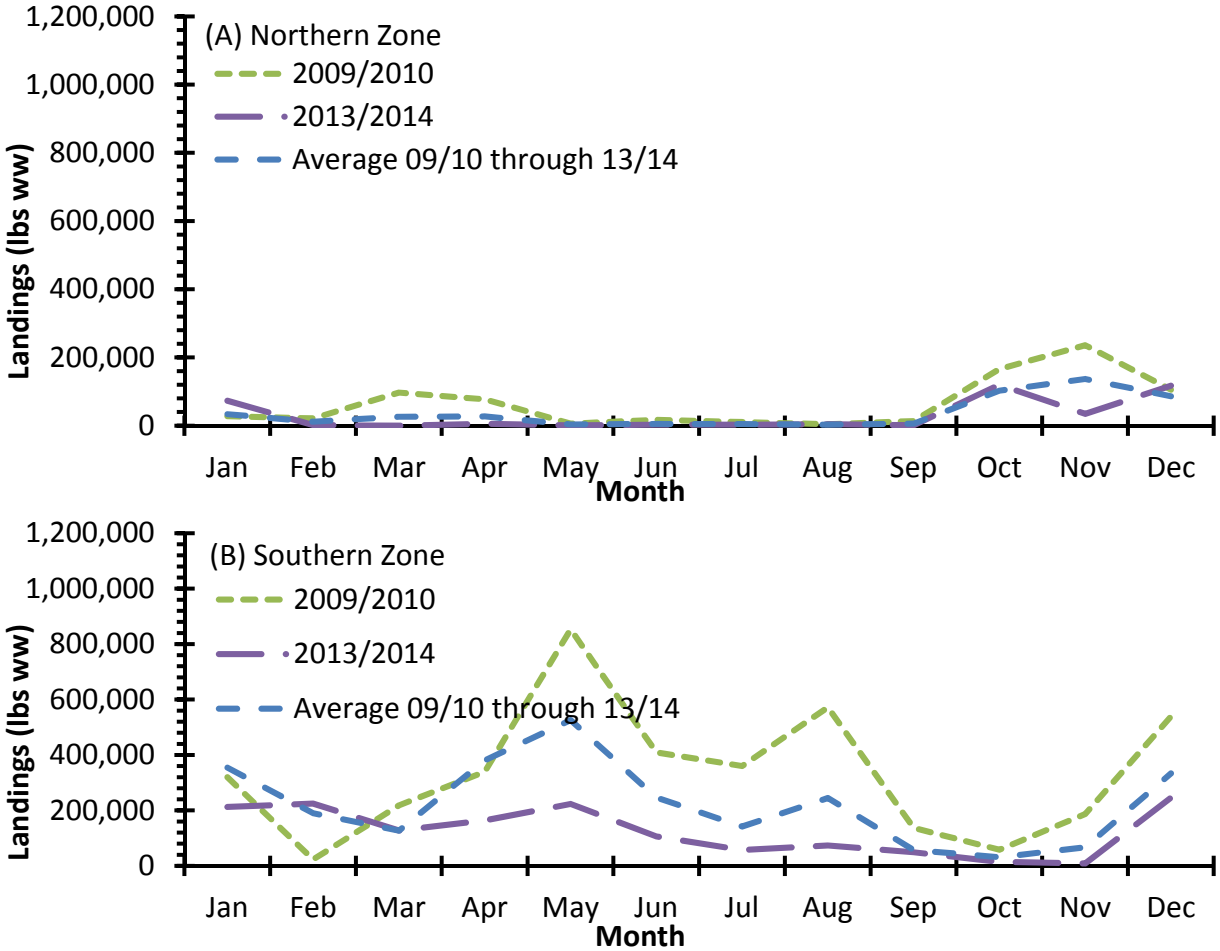

Figure 2. Atlantic king mackerel commercial landings by month from 2010 through 2014 following the current fishing season of March to February for the Northern Zone and Southern Zone. The Northern zone is New York through North Carolina and the Southern Zone is South Carolina through the Dade/Monroe county line in Florida. The landings were separated into the three landings scenarios of 1) 2009/2010 landings, 2) 2013/2014 landings, and 3) average landings from 2009/2010 through 2013/2014.

Action 2-2 of CMP 26 provides a range of commercial quotas for Atlantic king mackerel. Under this Action no closure dates were predicted for the Northern zone. This is because the total season landings for the highest landings scenario (March to February for 2009/2010) in the

Northern zone are below the lowest quota being considered. For example, the total 2009/2010 Northern zone landings are 786,101 lbs ww and the lowest Northern zone commercial quota is 898,560 lbs ww (Action 2-1, Alt 4). The Southern zone did have some predicted closure dates (**Table 1**). Due to the large range of quotas proposed in Action 2-2 NOAA General Counsel recommended only analyzing three different quotas for the Southern zone. The three Southern zone quotas analyzed were 5,002,400 lbs ww, 3,694,080 lbs ww, and 3,001,440 lbs ww.

Table 1. Predicted closure dates for commercial season in the Southern Zone for Action 2-2. The closure dates were predicted for the Atlantic migratory group in the Southern Zone using the highest landings scenario (2009/2010 landings). The closure dates are based on the commercial quotas of 5,002,400 lbs ww, 3,694,080 lbs ww, and 3,001,440 lbs ww. Cells with closure dates were highlighted in yellow.

	Season
	Mar-Feb
Quota	5,002,400
Closure Date	No Closure
Quota	3,694,080
Closure Date	1-Jan
Quota	3,001,440
Closure Date	8-Nov

Action 4 of CMP 26 proposes splitting the commercial season for the Southern zone. The action proposes four alternatives. Alternative 1 is no action and the season will be from March 1st to February 28. Alternative 2 allocates the Southern Zone quota into two split season quotas: 60% to the period March 1 - September 30 (season 1) and 40% to the period October 1 – the end of February (season 2). Alternative 3 allocates the Southern Zone quota into two split season quotas: 60% to the period March 1 – October 31 (season 1) and 40% to the period November 1 – the end of February (season 2). Alternative 4 allocates the Southern Zone quota into two split season quotas: 50% to the period March 1 – October 31 (season 1) and 50% to the period November 1 – the end of February (season 2). All of four of alternatives were analyzed with the three different landings scenarios. As discussed above, General Counsel recommended only analyzing three different quotas in the Southern Zone. The three quotas analyzed are 5,002,400 lbs ww, 3,694,080 lbs ww, and 3,001,440 lbs ww. No closure dates were predicted with the two landings scenarios of 2013/2014 and average 2009/2010 through 2013/2014 landings. Only the 2009/2010 landings were high enough to exceed some of the split season quotas, and it only occurred in the first part of the split season (season 1). **Table 2** below show the predicted closure dates for the 2009/2010 landings for the three different quotas. The three landings scenarios did not have any landings that exceeded the quotas for the second part of the split season (season 2).

Table 2. Predicted closure dates for commercial season alternatives for Action 4. The closure dates were predicted for the Atlantic migratory group in the Southern Zone using the highest landings scenario (2009/2010 landings). The closure dates are based on the commercial quotas of 5,002,400 lbs ww, 3,694,080 lbs ww, and 3,001,440 lbs ww. Cells with closure dates were highlighted in yellow.

	Action 4 Alternative						
	1	2		3		4	
	Mar-Feb 100%	Mar-Sep 60%	Oct-Feb 40%	Mar-Oct 60%	Nov-Feb 40%	Mar-Sep 50%	Oct-Feb 50%
Quota	5,002,400	3,001,440	2,000,960	3,001,440	2,000,960	2,501,200	2,501,200
Closure Date	No Closure	No Closure	No Closure	No Closure	No Closure	18-Aug	No Closure
Quota	3,694,080	2,216,448	1,477,632	2,216,448	1,477,632	1,847,040	1,847,040
Closure Date	1-Jan	2-Aug	No Closure	2-Aug	No Closure	2-Jul	No Closure
Quota	3,001,440	1,800,864	1,200,576	1,800,864	1,200,576	1,500,720	1,500,720
Closure Date	8-Nov	28-Jun	No Closure	28-Jun	No Closure	7-Jun	No Closure

Action 5 of CMP 26 proposes various trip limits for the Florida east coast portion of the Southern zone. To be consistent with the only landings scenario that predicted closures the percent reductions in landings from the trip limits were only calculated with 2009/2010 landings. Action 5 is considering trip limits in numbers of fish, however, the commercial trip level data (logbook data) has the landings reported in pounds. The commercial trip level data is used to calculate percent reductions in landings from imposing a trip limit. The pounds were converted to numbers of king mackerel by dividing pounds by the average weight. Average weight of king mackerel was determined from the Trip Intercept Program (TIP) data which was provided from the SEFSC in December of 2015. TIP data comes from commercial intercepts and records the weight and length of all fish harvested on a trip. The TIP data containing king mackerel harvest were filtered so only the 2009/2010 data remained to be consistent with the predicted closure dates. The TIP data was also filtered to isolate Florida's east coast king mackerel records since Action 5 is proposing new trip limits only on the east coast of Florida. The TIP data produced an average weight of 8.48 lbs ww. Therefore, a trip limit of 50 fish is equivalent to a 434 lbs ww trip limit, and a trip limit of 75 fish is equivalent to a 636 lbs ww trip limit of king mackerel. Alternative 2 would impose a year-round trip limit of 75 fish for the area south of the Flagler/Volusia county line. This alternative would reduce the trip limit from 3,500 lbs ww (current trip limit) down to 75 fish from April 1 through October 31 in the waters off Volusia County. This was analyzed by calculating percent reduction in landings with the trip level data that is close to the statistical areas reported in the waters off of Volusia County (statistical areas 2981 through 2975). Alternative 2 would also impose a 75 fish trip limit from Volusia through Miami-Dade County from November 1 through March 31. This region already has a 75 fish trip limit from April 1 through October 31. The new trip limit of 75 fish from November 1 to March 31 was analyzed by calculating percent reduction in landings with the trip level data that is close to the statistical areas reported in the waters from Volusia through Miami-Dade County (South Atlantic statistical areas less than 2981). The percent reductions are shown in **Table 3**, and were applied to the corresponding county landings on the east coast of Florida. The prediction dates were recalculated with the adjusted landings from applying the percent reduction from the 75

fish trip limit. **Table 4** summarizes the predicted closure dates. As stated above, prediction dates were only calculated with 2009/2010 landings because the other landings scenarios were lower and did not have any predicted closure dates.

Table 3. Monthly percent reductions in king mackerel landings for the 75 fish trip limit for specific counties on the east coast of Florida. The reductions were calculated from commercial trip level data in 2009/2010.

Month	Only Volusia County	Flagler/Volusia to Miami/Dade
	75 Fish	75 Fish
Jan	0.0	1.0
Feb	0.0	12.6
Mar	45.2	2.2
Apr	62.7	3.7
May	46.4	8.4
Jun	8.3	4.3
Jul	31.3	7.1
Aug	0.0	3.2
Sep	4.7	1.5
Oct	2.5	0.9
Nov	2.7	3.3
Dec	6.1	3.4

Table 4. Predicted closure dates for commercial season alternatives for Action 4 with the 75 fish trip limit stated in Action 5 Alternative 2. The closure dates were predicted for the Atlantic migratory group in the Southern Zone using the landings from 2009/2010. The closure dates are based on the commercial quotas of 5,002,400 lbs ww, 3,694,080 lbs ww, and 3,001,440 lbs ww. Cells with closure dates were highlighted in yellow.

	Action 4 Alternative						
	1	2		3		4	
	Mar-Feb	Mar-Sep 60%	Oct-Feb 40%	Mar-Oct 60%	Nov-Feb 40%	Mar-Sep 50%	Oct-Feb 50%
Quota	5,002,400	3,001,440	2,000,960	3,001,440	2,000,960	2,501,200	2,501,200
Closure Date	No Closure	No Closure	No Closure	No Closure	No Closure	18-Aug	No Closure
Quota	3,694,080	2,216,448	1,477,632	2,216,448	1,477,632	1,847,040	1,847,040
Closure Date	5-Jan	2-Aug	No Closure	2-Aug	No Closure	1-Jul	No Closure
Quota	3,001,440	1,800,864	1,200,576	1,800,864	1,200,576	1,500,720	1,500,720
Closure Date	11-Nov	28-Jun	No Closure	28-Jun	No Closure	6-Jun	No Closure

The predicted closure dates from **Table 2** and **Table 4** are very similar. This is because the percent reductions were only applied to landings in the waters off Volusia through Miami-Dade.

There are many more landings in the Southern Zone (i.e. South Carolina, Georgia, east coast Florida north of Volusia county) that are not impacted by the trip limit proposed in Alternative 2. Additionally, the percent reductions for the 75 fish trip limit were only applied to the waters off Volusia county from April to October because this region already has had a 75 fish trip limit in the other months of the year. Also, the percent reductions for the 75 fish trip limit were only applied to the waters off of Volusia through Miami-Dade during November to March because this region already has a 75 fish trip limit in the other months of the year.

Alternative 3 of Action 5 proposes a 50 fish trip limit for the area south of the Flagler/Volusia county line for the month of March and then a trip limit of 75 fish for the rest of season 1. The alternative also has options to decrease the trip limit down to 50 fish if 75% of the ACL is met in season 1. Under Option 3a the reduced trip limit of 50 fish is imposed after August 1st if 75% of the ACL is met. Under Option 3b the reduced trip limit of 50 fish is imposed any time during season 1 when 75% of the ACL is met. To analyze this alternative percent reductions were calculated for the waters from Volusia through Miami-Dade counties for each month for both 50 and 75 fish trip limits (**Table 5**), then applied to the landings from these areas. As stated above, prediction dates were only calculated with 2009/2010 landings because the other landings scenarios were lower and did not have any predicted closure dates. **Table 6** provides the dates when 75% of the ACL is predicted to be met, and also predicted closure dates under Options 3a and 3b.

Table 5. Monthly percent reductions in king mackerel landings for both a 50 and 75 fish trip limit for waters off of Volusia through Miami-Dade counties in Florida. The reductions were calculated from logbook data in 2009/2010.

Month	Trip Limit	
	50 Fish	75 Fish
Jan	4.7	1.0
Feb	18.3	12.6
Mar	7.8	2.2
Apr	16.3	3.7
May	22.1	8.4
Jun	14.8	4.3
Jul	14.3	7.1
Aug	15.3	3.2
Sep	9.3	1.5
Oct	5.4	0.9
Nov	20.6	3.3
Dec	19.0	3.4

Table 6. Predicted closure dates for commercial season alternatives for Action 4 with the trip limit options stated in Action 5 Alternative 3. This alternative only proposes trip limits for season 1. The closure dates were predicted for the Atlantic migratory group in the Southern Zone using the landings from 2009/2010. The closure dates are based on the commercial quotas of 5,002,400 lbs ww, 3,694,080 lbs ww, and 3,001,440 lbs ww. Cells with closure dates were highlighted in yellow.

	Action 4 Alternatives			
	1	2	3	4
	Mar-Feb	Mar-Sep 60%	Mar-Oct 60%	Mar-Sep 50%
Season 1 Quota	5,002,400	3,001,440	3,001,440	2,501,200
75% of Quota	3,751,800	2,251,080	2,251,080	1,875,900
Predicted Date to Reach 75% of Quota	12-Jan	5-Aug	5-Aug	6-Jul
Option 3a Closure Date	No Closure	No Closure	No Closure	22-Aug
Option 3b Closure Date	No Closure	No Closure	No Closure	24-Aug
Season 1 Quota	3,694,080	2,216,448	2,216,448	1,847,040
75% of Quota	2,770,560	1,662,336	1,662,336	1,385,280
Predicted Date to Reach 75% of Quota	10-Sep	19-Jun	19-Jun	30-May
Option 3a Closure Date	18-Jan	4-Aug	4-Aug	3-Jul
Option 3b Closure Date	18-Jan	10-Aug	10-Aug	29-Jul
Season 1 Quota	3,001,440	1,800,864	1,800,864	1,500,720
75% of Quota	2,251,080	1,350,648	1,350,648	1,125,540
Predicted Date to Reach 75% of Quota	5-Aug	29-May	29-May	21-May
Option 3a Closure Date	2-Dec	29-Jun	29-Jun	7-Jun
Option 3b Closure Date	2-Dec	24-Jul	24-Jul	25-Jun

No analysis of predicted closure dates were conducted for Alternative 4 of Action 5. This is because all three of the landings scenarios have season 2 landings below the quotas proposed in Action 4. Therefore, no closure dates are expected in season 2 with or without trip limits.

APPENDIX H. ECONOMIC ANALYSIS OF REALLOCATION SCENARIOS FOR GULF MIGRATORY GROUP KING MACKEREL

July 6, 2015

Social Science Research Group and Sustainable Fisheries Division
NOAA Southeast Fisheries Science Center

This communication addresses the request to conduct an economic analysis of Gulf of Mexico king mackerel reallocation proposals in support of Amendment 24 to the Fishery Management Plan for the Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region. The request solicited an analysis of alternatives that could redistribute 2%, 5%, 10%, or 20% of the king mackerel quota from the recreational sector to the commercial sector. Table 1 shows the current allocation and proposed alternatives.

Table 1. Status quo and allocation alternatives

		Percent from Recreational to Commercial			
Sector	SQ	2%	5%	10%	20%
			--Allocation in Percent--		
Commercial	32%	34%	37%	42%	52%
Recreational	68%	66%	63%	58%	48%
			--Allocation in million lbs--		
Commercial	3.456	3.672	3.996	4.536	5.616
Recreational	7.344	7.128	6.804	6.264	5.184

The methods and data used in the short-run allocation economic analysis are documented in the Appendices A and B. Table 2 summarizes the main results of the analysis. The short-run analysis suggests that the largest (20%) reallocation proposal could increase the welfare of the commercial sector and the nation by almost $1 million dollars per year. Any reallocation to the commercial sector would increase the amount harvested and decrease recreational and commercial catch rates because the recreational sector does not harvest their entire annual catch limit (ACL). Because in the short-run the reduction in commercial and recreational catch rates is likely to be minor, commercial harvesting costs and the quality of the recreational experience are not expected to be impacted. However, in the medium and long-run, large reallocations could lead to significant catch rate reductions, particularly in the recreational sector, which could reduce the welfare of this sector because anglers value catching and releasing king mackerel. Presently, the long-run impacts of these reallocation proposals cannot be estimated. Preliminary estimates from the king mackerel stock assessment model suggests that reductions in catch rates could be significant if a large portion of the surplus (un-harvested) recreational ACL is reallocated to the commercial sector (Appendix B and C). Additional research is necessary to compare the longer-term economic costs of recreational catch rate reductions with the economic benefits of reallocating to the commercial sector.

Table 2. Inflation-adjusted annual net benefits from quota reallocation proposals (2014=100).

Reallocation Alternative	Anticipated annual added benefits ($) to the commercial sector	Anticipated annual losses ($) to the recreational sector	Annual net benefit ($) from the reallocation alternative
2%	92,532	Negligible	92,532
5%	231,331	Negligible	231,331
10%	462,664	Negligible	462,664
20%	925,328	Negligible	925,328

*This short-run analysis assumes that the quality of the fishing experience is not diminished by potentially lower catch rates.

Appendix H-A. Commercial Sector Analysis

Overview

King mackerel (*Scomberomorus cavalla)* is a migratory coastal pelagic species that supports important commercial and recreational fisheries in the Gulf of Mexico and South Atlantic regions. In the Gulf of Mexico the recreational sector is assigned 68% of the overall quota and the commercial sector is assigned the remaining 32%. The recreational sector typically harvests less than half of their allocation of the Gulf of Mexico king mackerel quota whereas commercial sector harvests have consistently been at or above their quota allocation. Consequently, the Gulf the Mexico Fishery Management Council is considering policies that would redistribute 2%, 5%, 10%, or 20% the king mackerel quota from the recreational sector to the commercial sector.
In the 2013/14 fishing season, the commercial fleet landed over 2.5 million pounds (mp) of king mackerel gutted weight (gw) worth $5.6 million in revenues in the Gulf of Mexico. Handlines, trolling gear, and to a lesser extent gillnets are the main fishing gear used. The Gulf king mackerel commercial fishery is managed with limited entry, area and gear specific quotas, fishing seasons, trip limits and minimum size limits. Issuance of new king mackerel vessel permits is under a moratorium, but existing permits are transferable. The harvest of king mackerel using gillnet in the Florida west coast subzone requires a gillnet endorsement. Table 1 provides an overview of the main regulations affecting the commercial sector.

Table 1. Main commercial regulations for the Gulf of Mexico king mackerel fishery.

Zones	Subzone	Gear Sector	Quota (lbs)	Trip limit (lbs)	Fishing year
Western			1,071,360	3,000	Jul 1-Jun 30
Eastern	East Coast		1,102,896	50/75 fish[1]	Nov 1-Mar31
	Northern		178,848	1,250/500 (H&L)	Jul 1-Jun 30
	Southern	Hook and line	551,448	1,250/500	Jul 1-Jun 30
		Gillnet	551,448	25,000	MLK(Feb)[2]-Jun 30

[1]The average weight for a king mackerel in the South Atlantic region is about 9.8 lbs. (John Walter, pers. comm.). The conversion ratio from gutted weight to whole weight is 1.04.
[2] Martin Luther King (MLK) holiday.

Conceptual Model

To investigate the potential economic gains of quota redistribution proposals to the commercial sector, we assume that commercial fishermen that land king mackerel want to maximize net benefits subject to the king mackerel trip limit (i.e., trip quota). Therefore, when king mackerel landings make up the majority of the trip landings, we posit that fishermen maximize net benefits by minimizing their harvesting costs because they face an exogenously set trip limit (i.e., revenues are fixed). Conversely, when king mackerel landings do not account for the majority of the trip landings we assume that fishermen maximize net benefits over the entire catch mix, not

only king mackerel.[6] In other words, fishermen maximize profits by controlling both harvesting costs and the catch composition. This profit maximizing behavioral assumption implicitly assumes that when fishermen reach their king mackerel trip limit they stop fishing. King mackerel acts a constraint on the trip level harvesting process. Hence, the economic value of a king mackerel at the trip limit is the added net revenue obtained from the entire catch mix obtained by relaxing the king mackerel trip limit by one unit (i.e., its shadow price). If the trip limit is not binding then the marginal benefit from easing the trip limit is zero.

Under the cost minimizing behavioral model, we assume that fishermen can only select the optimal input or factor mix since they face an exogenously determined king mackerel trip limit. Mathematically,

$$\text{Min C}(w, y) = \sum_{j=1}^{m} w_j x_j(w, y) \tag{1}$$

where C is the restricted (short-run) cost function, y is harvest of king mackerel, w_j is the price of input j, and x_j is the amount of input j used. As is customary in production analyses, we presume that the cost function is non-decreasing in input prices and output, linearly homogenous in input prices and concave and continuous in input prices.

Differentiating the cost function with the respect to the fixed (or regulated) output (i.e., king mackerel) we obtain the marginal cost function

$$\frac{\partial C}{\partial y} = MC(w, y). \tag{2}$$

The marginal cost function captures the cost of harvesting an additional unit of king mackerel. The net benefit of harvesting an additional unit of king mackerel is the difference between the king mackerel dockside price and the marginal cost. Mathematically,

$$\lambda_1^c = \text{p}_1 - \frac{\partial C(w, y)}{\partial y}. \tag{3}$$

Note that because we cannot directly observe marginal costs, we need to recover the marginal cost function from the estimates of the system of input demand functions, which are obtained by applying Shepard's lemma. Mathematically,

$$\frac{\partial C}{\partial w_j} = x_j(w, y). \tag{4}$$

Input demand functions describe the optimal adjustment of inputs in response to changes in input prices given an exogenously determined output level.

[6] For analytical purposes, we (arbitrarily) assumed that "the majority of the landings" rule applies when king mackerel makes up 85% or more of the overall trip landings. This assumption lends greater confidence to the cost minimization assumption.

Now, when king mackerel landings do not make up the majority of the trip landings, we assume that fishermen maximize profits by selecting the economically optimal input use and catch mix and subject to the king mackerel trip limit. Mathematically,

$$Max \;\; \pi(p,w;q) = \sum_{i=1}^{n} p_i y_i - \sum_{j=1}^{m} w_j x_j + \lambda(q - y_1) \tag{5}$$

were π is the restricted (short-run) profit function, y_i is harvest of species i (i=1 king mackerel), w_j is the price of input j, x_j is the amount of input j used and q is the king mackerel trip limit. The marginal net benefit (or 'shadow price') of an additional king mackerel is given by the added profit from harvesting over the entire harvest mix when the king mackerel trip limit is relaxed by one additional unit. The shadow price of relaxing the king mackerel trip limit by one unit is simply found by differentiating the profit function with respect to the regulated output (king mackerel)

$$\frac{\partial \pi}{\partial q} = \lambda_1^p . \tag{6}$$

As in the case of the cost minimization model, we cannot directly observe the shadow price so we need to recover it from the estimates of the jointly estimated system of input demands and output supply.

Differentiating the profit function with the respect to input prices we obtain input demand functions

$$\frac{\partial \pi}{\partial w_j} = -x_j . \tag{7}$$

Applying Hotelling's lemma, we obtain the output supply for species $i \neq 1$

$$\frac{\partial \pi}{\partial p_i} = y_i . \tag{8}$$

The input demand and output supply functions describe the optimal adjustment of outputs and inputs in response to changes in output and input prices.

Data

Detailed trip-level data on landings, gear, fishing effort, landing and fishing location, crew size, vessel characteristics, dockside prices and variable costs for those vessels that landed at least one hundred pounds of king mackerel (one thousand pounds for gillnets) were obtained from the National Marine Fisheries Service. The analysis was limited to hook and line (i.e., handline and troll) and gillnet vessels because they were responsible for the majority of the landings. The analysis focused on the last three complete fishing years (2011/12 through 2013/14) to mitigate potential confounding effects from the Deepwater Horizon oil spill.

The empirical model specified two inputs and one (or two) outputs depending on the behavioral model. The two outputs (species) were king mackerel and a residual or miscellaneous group. The price of the residual species was obtained by dividing the total gross revenue by the total landings (excluding king mackerel). The two inputs included energy (fuel consumption) and labor (crew size). Annual dummies were used to control for king mackerel resource abundance. Fishing year 2013/14 was defined as the base year. Because fuel consumption information is only collected on a subset of the fleet, we imputed fuel consumption for the remaining vessels as a function of vessel characteristics and trip duration. Diesel #2 prices were obtained from the US Energy Information Administration.

The return to the labor was measured by its opportunity cost. The crew's opportunity cost was set equal to wages of production employees, whereas captains received an arbitrary 20% premium over regular crew's earnings (Squires, 1988; Walden *et al.*, 2014). The labor earnings were obtained from the U.S. Bureau of Labor Statistics. The opportunity cost of captain and crew were aggregated into a single wage rate. All output and input prices were adjusted by the GDP deflator (2014=100). Table 4 summarizes the descriptive statistics.

Table 2. Descriptive statistics of the commercial fleet.

Variable	Units	Mean	Minimum	Maximum	Std. Deviation
King mackerel landings	lbs gw/trip	376.07	0.96	38,813.46	1,048.69
Other species landings	lbs gw/trip	127.89	0.01	11,995.00	515.24
Diesel # 2 price	$/gallon	3.24	2.86	3.55	0.16
Captain and crew wage	$/trip	226.24	165.06	2,642.99	150.03
Price of king mackerel	$/lbs gw	2.50	0.63	4.59	0.62
Price of other species	$/lbs gw	0.95	0.01	51.13	1.70

*All prices and wages are deflated using the GDP deflator (2014=100)

Empirical model

Broadly, we estimate the added benefits from redistributing quota to the commercial sector by assuming that the commercial sector is made up of cost minimizing and profit maximizing fishing vessels. Due to the multiplicity of area and gear specific quotas, we estimated indirect, trip-level cost and profit functions for the main area-gear combinations. Both cost minimizing and profit maximizing behavior were modelled using a generalized Leontief flexible function form.

The indirect restricted cost function is given by

$$\mathrm{C(w,y)} = y\left(\sum_{i=1}^{2}\sum_{k=1}^{2}\beta_{ik}(w_i^{1/2}w_k^{1/2}) + \sum_{i=1}^{2}\sum_{l=1}^{2}\delta_{il}w_iD_l\right) \tag{9}$$

where w_i are input prices (fuel and labor), y is the king mackerel landings and *D is* a dichotomous variable to account for annual changes in king mackerel abundance. Symmetry is imposed by setting $\beta_{ik}=\beta_{ki}$ for $k\neq i$.

Applying Shepard's lemma, we obtain the factor demand which we divide by the output level to reduce the potential for heteroscedasticity (Parks, 1971). Mathematically,

$$\frac{1}{y}\frac{\partial \mathrm{C(w, y)}}{\partial w_i} = -\frac{x_i}{y} = \sum_{i=1}^{2} \beta_{ik} (\frac{w_k}{w_i})^{1/2} + \sum_{l=1}^{2} \delta_{il} D_l \ . \tag{10}$$

Using the parameters estimated above, we recover the marginal cost function which is given by

$$\frac{\partial \mathrm{C(w, y)}}{\partial y} = \mathrm{MC(w, y)} = \sum_{i=1}^{2}\sum_{k=1}^{2} \beta_{ik} (w_i^{1/2} w_k^{1/2}) + \sum_{i=1}^{2}\sum_{l=1}^{2} \delta_{il} w_i D_l \ . \tag{11}$$

Then, we obtain the net benefit from harvesting an additional unit by subtracting the king mackerel dockside price from the marginal cost. Mathematically,

$$\lambda_1^c = \mathrm{p}_1 - \frac{\partial C(w,y)}{\partial y} \ . \tag{12}$$

The indirect restricted profit function captures the difference between dockside revenues and variable costs (fuel and labor) and is given by

$$\pi(p,y) = y_1 (\sum_i \sum_j \beta_{ij} (p_i^{1/2} p_j^{1/2}) + \sum_i \sum_l \delta_{il} p_i D_l) \tag{13}$$

where π is the profit function, p_i are input and output prices, *D* is a dichotomous yearly dummy to control for changes in king mackerel abundance and y_1 is the fixed output, king mackerel. King mackerel was modeled as a fixed output because is subject to an exogenously determined trip limit. The fishing year 2013/14 is set as the base year. Symmetry is imposed by setting $\beta_{ij}=\beta_{ji}$ for $i\neq j$.

Applying Hotelling's lemma, we obtain the associated output supply for $i\neq 1$

$$\frac{1}{y_1}\frac{\partial \pi}{\partial p_i} = y_i = (\beta_{ii} E + \sum_{j\neq i} \beta_{ij} (\frac{p_j}{p_i})^{1/2} + \sum_l \delta_{il} D_l) \tag{14}$$

and input demand equations

$$\frac{1}{y_1}\frac{\partial \pi}{\partial p_j} = -x_j = (\beta_{jj} E + \sum_{i\neq j} \beta_{ij} (\frac{p_i}{p_j})^{1/2} + \sum_l \delta_{jl} D_l) \ . \tag{15}$$

These supply and demand functions describe the optimal adjustment of outputs and inputs in response to changes in output and input prices.

Differentiating the profit function with respect to the fixed output (y_1) we obtain the shadow price

$$\frac{\partial \pi}{\partial y_1} = \lambda_1^p = (\sum_i \sum_j \beta_{ij} (p_i^{1/2} p_j^{1/2}) + \sum_i \sum_l \delta_{il} p_i D_l) \tag{16}$$

To assess the economic consequences of reallocating quota to the commercial sector, we make the following additional assumptions. First, we conjecture that the quota increase would materialize in the form of trip limit increases (in proportion to the proposed quota change) since the length of the fishing season is not binding (while quota is available). Second, following Holzer and McConnell's (2014) recommendation we utilize the mean marginal WTP as proxy of net benefits since the current management regime does not ensure that fishermen who value the resource the most will have preferential access to it. In addition, we posit that fishermen would exhaust the added quota as long as the dockside revenue exceeds the marginal cost of harvesting under the cost minimization behavioral model. We also assume that the proportion of the landings that meet or exceed a given trip limit would be the same for the various reallocation proposals under the profit maximizing behavioral model.[7] These last two assumptions become more tenuous for the larger reallocation proposals (5%-20%).

Finally, we estimate the net benefit to the commercial sector for a given reallocation proposal by weighing the lambdas from equations (12) and (16) by the share of current quota taken by each benefit maximizing strategy (cost minimization vs. profit maximization) and multiply them by the proposed quota increase.

$$\Delta \text{ Net Benefit} = \lambda_1^c (\frac{h_t^{\text{cost min}}}{Quota_t}) \ \Delta\text{Quota} + \lambda_1^p \ \ (\frac{Quota_t - h_t^{\text{cost min}}}{Quota_t})\Bigg|_{\text{king mackerel trip landings} \geq \text{king mackerel trip limit}} \Delta\text{Quota} \tag{17}$$

Note that because of the profit maximizing behavioral assumption we only multiply the shadow price by the harvest of those trips that met or exceeded the trip limit (i.e., binding constraint).

Results

As noted earlier because we only had information on fuel consumption for about 20% of the fleet, we imputed fuel consumption for the remaining fleet using fishing effort and vessel characteristics as explanatory variables. The fuel consumption equations were estimated using ordinary least squares (OLS). The R^2 for the fuel equations ranged from 0.01 to 0.73. The

[7] For clarity, in the analysis we adopt the higher trip limit available, when multiple trip limits exist in one management area.

system of input demand and output supply functions were jointly estimated using iterated seemingly unrelated regression (ITSUR).[8] The generalized R^2 for the system of equations ranged from 0.09 to 0.41.[9] Marginal cost estimates range from $0.12/lbs gw to $1.50/lbs gw whereas king mackerel shadow prices range from $2.02/lbs gw to $33.54/lbs gw. Some of the shadow price estimates are high and should be viewed with caution (e.g., Western zone, Eastern zone, Northern subzone).

The preliminary analysis suggests that increasing the commercial quota by 2% would result in an increase in net benefits (i.e., quasi-rent or revenues minus fuel costs and the opportunity cost of labor) of $92,532 to the commercial sector whereas a 20% increase would result in a larger net increase of $925,328 (Table 3).

Table 3. Inflation-adjusted net benefits from quota reallocation proposals (2014=100).

Zones	Subzone	Gear Sector	Added net benefits ($) from increasing the baseline quota by			
			2%	5%	10%	20%
Western			35,214	88,035	176,070	352,140
Eastern	East Coast		29,935	74,839	149,677	299,356
	Northern		7,917	19,792	39,586	79,171
	Southern	Hook and line	7,907	19,767	39,535	79,069
		Gillnet	11,559	28,898	57,796	115,592
Grand Total			92,532	231,331	462,664	925,328

[8] Due to the multiplicity of area-gear combinations, we do not report parameter estimates; however, these are available from the authors.

[9] The generalized R^2 was estimated as 1- exp[2(Lo - Lm)/N], where Lo (Lm) is the sample maximum of log-likelihood when all slope coefficients equal zero (unconstrained) and N is the sample size.

Appendix H-B. Recreational Sector Analysis

Research suggests that anglers value both keeping and releasing king mackerel (Carter and Liese, 2012). Therefore, the recreational sector would forgo economic benefits if un-harvested (or "surplus") quota is reallocated to the commercial sector because the quality of the fishing experience could be diminished by the lower catch rates. The timing and significance of this "stock effect" could vary depending on the amount of the surplus recreational ACL that is reallocated and harvested by the commercial sector. We do not expect that the stock effect to be strong enough in the initial years following any of the alternative reallocations to result in a reduction in recreational catch rates. Consequently, there would be little, if any, loss in economic value to the recreational sector in the first year following even the largest (20%) proposed reallocation to the commercial sector.

Potential Longer Term Effects of Reallocation Policies

We do not have the information at present to calculate the long-term foregone economic value in the recreational sector associated with reallocation policies. However, the current king mackerel stock assessment model (SEDAR 38) can be used to simulate the potential change in catch rates.[10] The two cases we simulate are purely illustrative and are not directly related to any of the reallocation policies currently under consideration. The first case is the situation where none of the current recreational ACL surplus is reallocated to the commercial sector and the second case considers the situation where all of the current recreational ACL surplus is reallocated to the commercial sector. The simulations are described in Appendix C.

The simulated king mackerel catch rates results for the two cases from 2016 to 2022 are shown in Figure 1. The graph shows that the catch rates for both recreational fishing fleets are expected to be lower if the surplus recreational ACL is reallocated to the commercial sector. The difference between catch rates for the two cases grows for about seven years and then stabilizes in equilibrium at around 20%. The difference in catch rates widens over time because the fish not reallocated to the commercial sector are left to accumulate in the water so that fishing is more effective.

Note that the results from the stock assessment model simulations cannot readily be used to calculate potential changes in economic value to the recreational sector that are comparable with the estimates calculated for the commercial sector. The commercial sector results are based on changes from the existing king mackerel ACL and the geographic definition of the stock structure (i.e., the mixing zone) used in the previous stock assessment. The simulations performed for the analysis of the recreational sector catch rates used the most recent stock assessment model (SEDAR 38) that uses an updated stock structure and the ACL stream. The results of SEDAR 38 have not yet been used to set new ACLs or to redefine the stock structure for regulator purposes.

[10] The SEDAR 38 king mackerel stock assessment model is documented at: http://sedarweb.org/sedar-38.

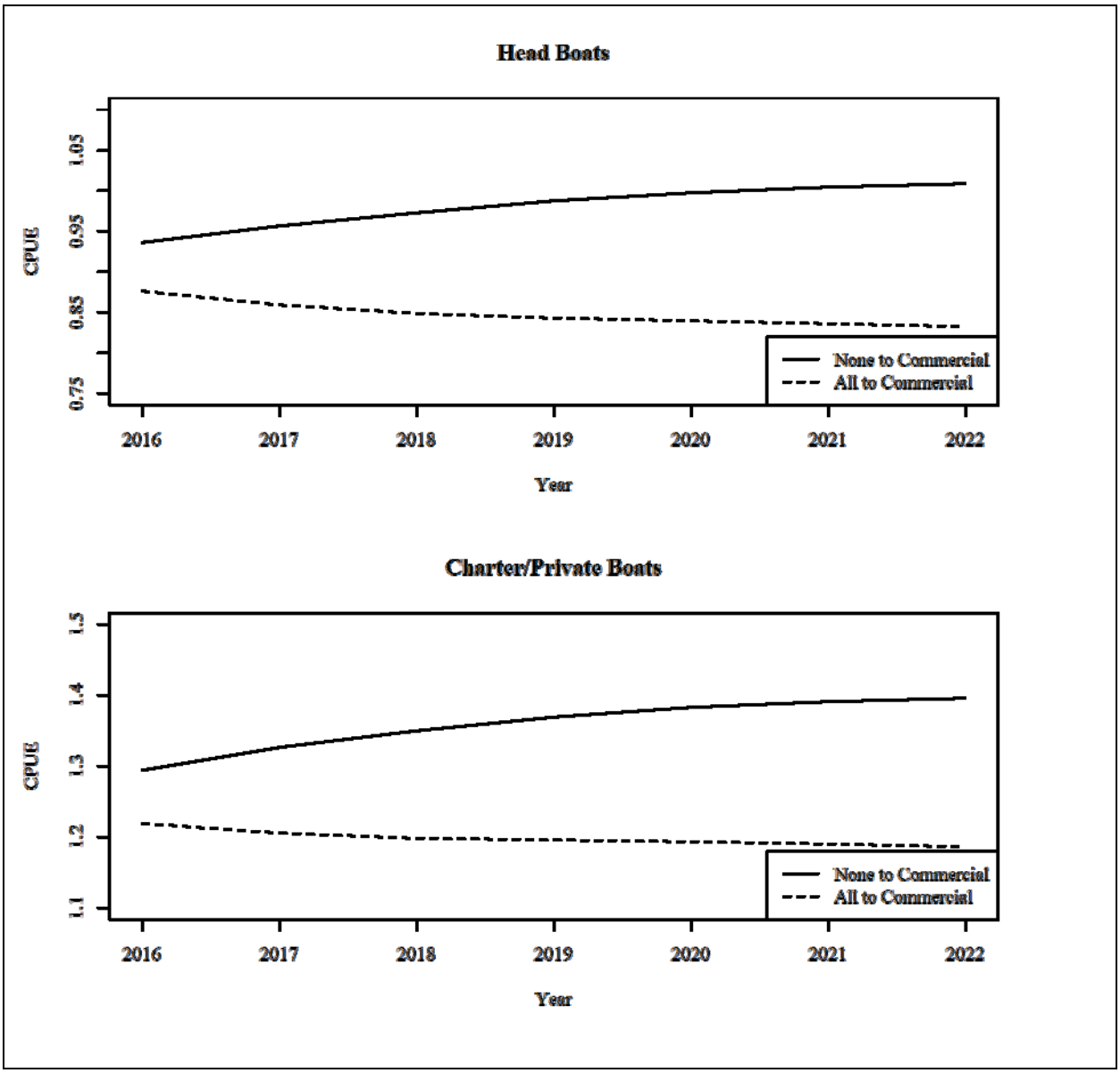

Figure 1. Catch rates (CPUE) when all or none of the surplus recreational ACL is reallocated to the commercial sector.

Appendix H-C. Effects on recreational CPUE of reallocation of the recreational of Gulf of Mexico king mackerel under-age to commercial sector

In recent years (fishing years 2011-2013, http://sero.nmfs.noaa.gov/sustainable_fisheries/acl_monitoring/) the recreational fishery for king mackerel in the Gulf of Mexico has only caught ~38% of its annual catch limit. Projections of the SEDAR 38 assessment assume that the recreational fishery will catch its ACL (Status quo scenario, in this analysis). However, there is the potential that the recreational underage could be reallocated to the commercial handline and gill net fishery (Reallocation scenario). This analysis evaluates the estimated impact on recreational catch per unit effort (CPUE) if such a reallocation occurs.

The analysis was conducted by projecting the population forward in time to year 2030 and then estimating the difference in expected recreational CPUE under the status quo allocation of landings and under the reallocation scenario. The analysis proceeded as follows:

1. Project the SEDAR 38 Base model forward to 2030 at F_{SPR30} to obtain the equilibrium (after all transient cohort effects have passed) allocation of landings by weight. The resulting allocation is 40:60 commercial:recreational

2. Assume that the recreational fleet only catches 38% of their allocation (0.60*0.38=23%). Reallocating the remainder of the retained biomass to the commercial fleet's results changes the allocation to this sector to 77%. This reallocation is achieved in the projections by assigning the commercial (handline and gillnet) and recreational (headboat and charter/private) to separate allocation groups and projecting a 77:23 reallocation. This reallocation achieves the same total ACL as the base projections but reallocates the retained yield.

3. Calculate the expected CPUE for the two recreational fleets under the status quo and reallocation scenarios.

4. The expected CPUE for each scenario was obtained by multiplying numbers at age *x* selectivity at age *x* catchability

Comparison between the Stock Assessment Status Quo and the Reallocation Scenarios

Under the Reallocation scenario, the expected equilibrium CPUE was ~0.7%higher for the headboat fleet (Figure 1.A) and ~1.3% higher for the charter/private fleet (not shown). This was due to the higher projected numbers of vulnerable fish (Figure 1.B). Note that the decline, under both scenarios, in the numbers, of vulnerable fish reflects the fishing down of the population currently above the B_{MSY} proxy towards the target level. This reduces the total fish available to each fleet, reducing the expected CPUE.

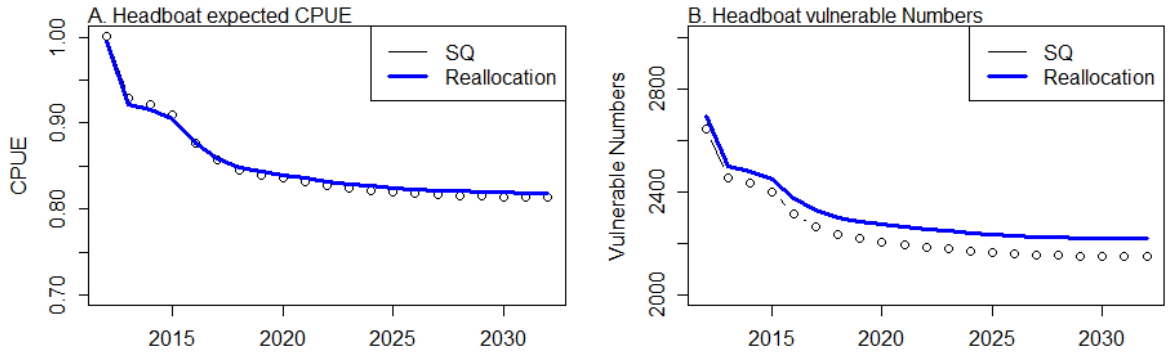

Figure 1. Projected CPUE (A) and vulnerable numbers (B) for headboat fleet under the status quo and reallocation scenarios.

The differences in expected CPUE are very minor and unlikely to be detectable. The major reason that the differences are very minor are that the selectivities for the different fleets are relatively similar (Figure 3) indicating that reallocation between the recreational and commercial fleets results in little change in the overall pattern of fishing mortality at age or size. Furthermore, while the recreational fishery has slightly higher levels of dead discards per landed fish than the commercial fishery, the reallocation does not greatly alter the total levels of discards. What minor differences exist between the two scenarios is likely a result of a very slightly higher level of SSB (Figure 3.A) as a result of a small the reduction (~15,000 per year) reduction in dead discards (Figure 3.B).

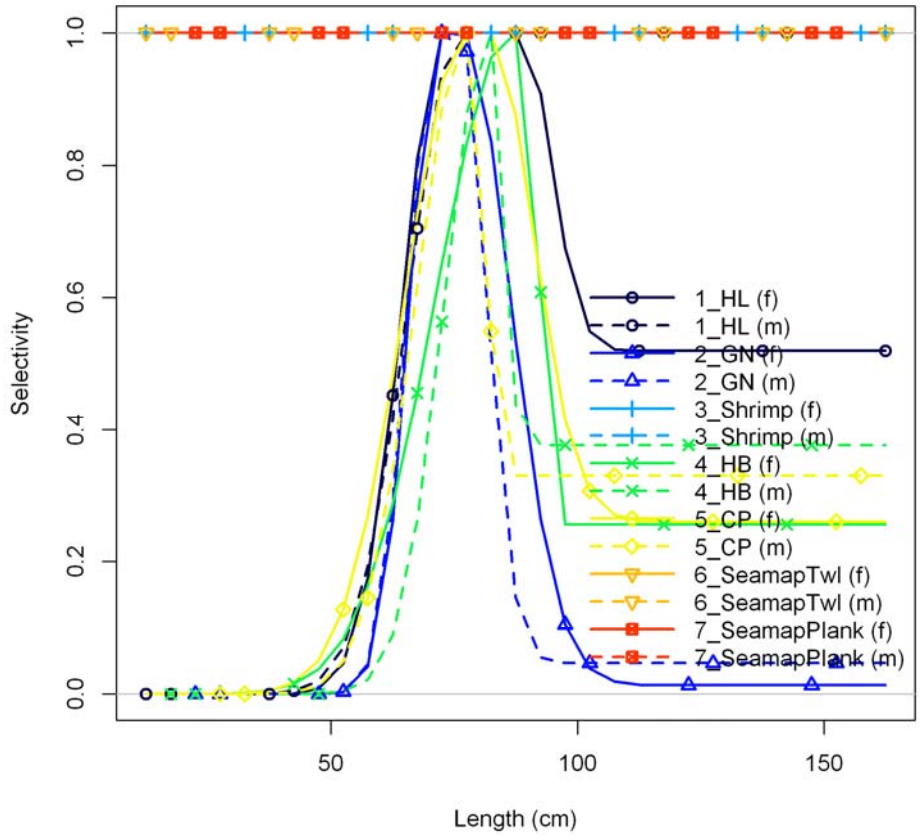

Figure 2. Estimated length-based selectivities for the each fleet from SEDAR 38 base model for Gulf of Mexico.

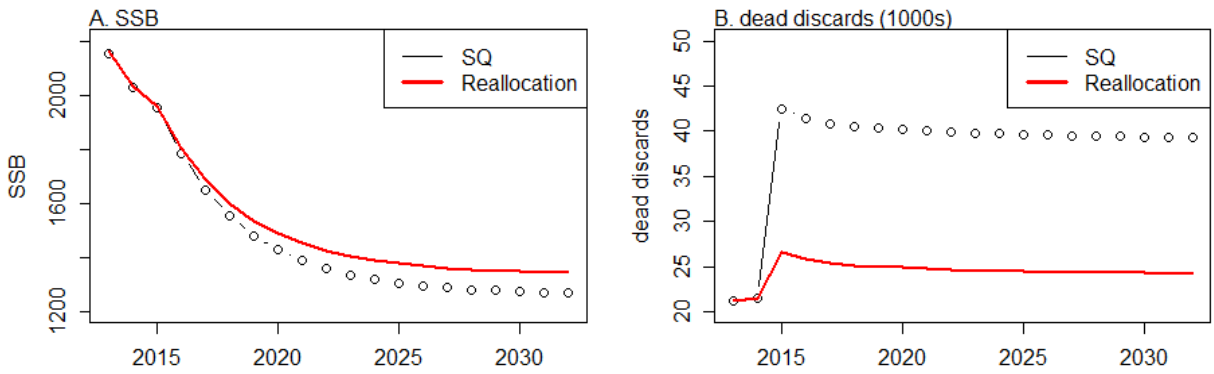

Figure 3. Estimated SSB (A) and dead discard (B) trends for the status quo and reallocation scenarios.

Comparison between the Current Underage and the Reallocation Scenarios

If the current recreational fleet underage was perpetuated into the future then the overall ACL would not be caught. This would allow the population to remain at higher than target levels (Figure 4) into the future and impact CPUE. To evaluate the impact on CPUE the recreational underages were projected into the future by reducing the equilibrium fishing mortality rates for each recreational fleet to 38% of their original value and projecting forward with the following levels of fixed F.

	Handline	Gillnet	Shrimp	Headboat	Charter/Private
Equilibrium F	0.069	0.060	0.133	0.014	0.239
Rec reduced by 38%	0.069	0.060	0.133	0.005	0.091

This resulting equilibrium CPUE values were 21% (headboat) and 25% (private recreational, not shown) higher than expected values under the status quo scenario (Figure 4).

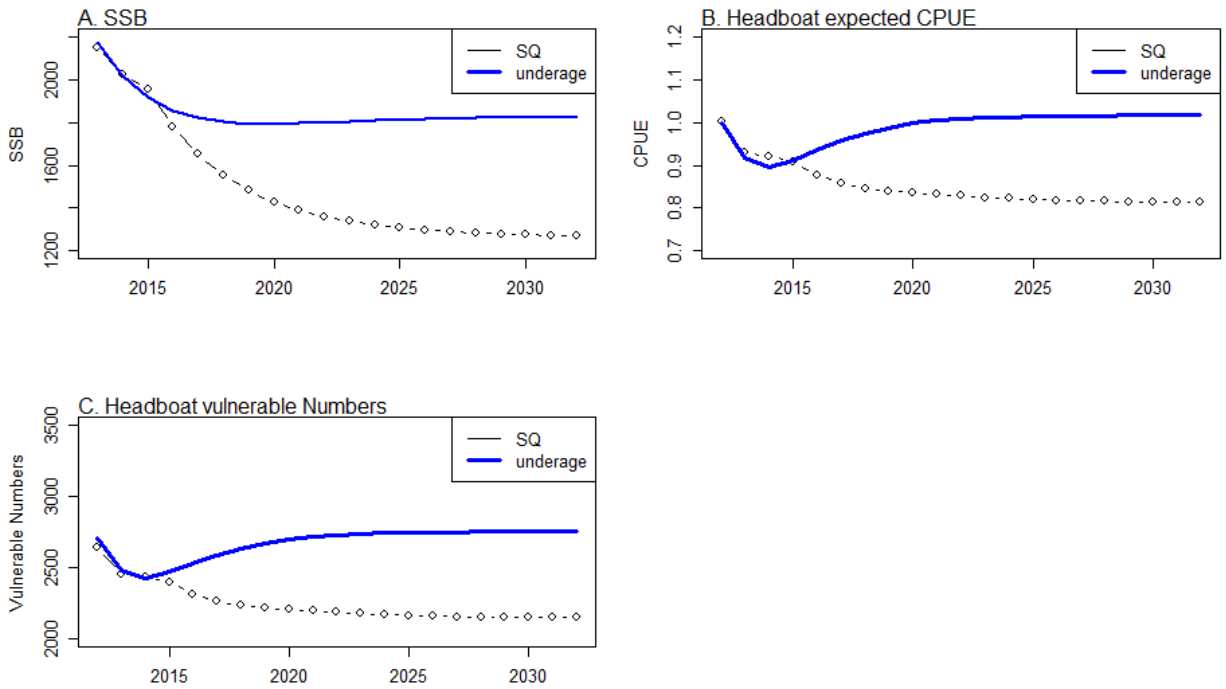

Figure 4. Projected SSB (A) CPUE (B) and numbers (C) for headboat fleet under the status quo and under the recreational underage scenario.

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