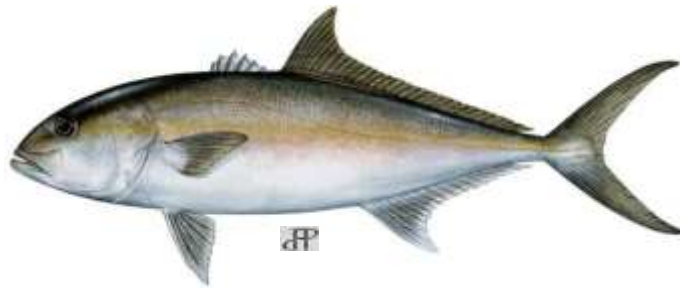


10/10/19

Modifications to the Greater Amberjack Recreational Management Measures



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

October 2019



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ENVIRONMENTAL ASSESSMENT COVER SHEET

Name of Action

Modifications to the Greater Amberjack Recreational Management Measures: Framework Action to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico

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Type of Action

<input type="checkbox"/> Administrative	<input type="checkbox"/> Legislative
<input checked="" type="checkbox"/> Draft	<input type="checkbox"/> Final

ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
AM	accountability measure
Bmsy	stock biomass level capable of producing an equilibrium yield of MSY
Council	Gulf of Mexico Fishery Management Council
Headboat	Headboat Survey
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	environmental justice
E.O.	Executive Order
FL	fork length
FMP	Fishery Management Plan
F _{MSY}	fishing mortality rate corresponding to an equilibrium yield of MSY
Gulf	Gulf of Mexico
LA Creel	Louisiana Creel Survey
M	Instantaneous rate of natural mortality
MFMT	Maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
MRIP	Marine Recreational Information Program
MSST	Minimum stock size threshold
MSY	Maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration
OY	Optimum yield
RA	Regional Administrator
SEDAR	Southeast Data, Assessment and Review
SERO	Southeast Regional Office
SPR	Spawning potential ratio
SSC	Scientific and Statistical Committee
TPWD	Texas Parks and Wildlife Department
ww	whole weight

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CHAPTER 1. INTRODUCTION

1.1 Background

In 2016, an update to the Southeast Data Assessment and Review (SEDAR) 33 Gulf of Mexico (Gulf) greater amberjack stock assessment was completed. The Gulf of Mexico Fishery Management Council's (Council) Scientific and Statistical Committee (SSC) reviewed this update at its March 2017 meeting. The SSC accepted the greater amberjack update assessment as the best scientific information available and concluded that greater amberjack was still overfished and undergoing overfishing, and the stock would not be rebuilt by 2019 as previously projected. To address the results of the most recent stock assessment, the Council completed a framework action (GMFMC 2017a) that modified the acceptable biological catch (ABC) along with the recreational annual catch limits (ACL) and annual catch targets (ACT) for greater amberjack (Table 1.1.1). The new catch limits reduced the allowable harvest for the 2018 and 2019 fishing years, with an increase in 2020 and beyond, and are expected to end overfishing and rebuild the stock by 2027. The stock status has remained unchanged from the 2018 fourth quarter update report which removed Gulf greater amberjack from the list of species undergoing overfishing, but lists the stock as overfished.¹

Table 1.1.1. Stock ABC, recreational ACL, and recreational ACT (pounds whole weight) set by the 2017 Framework Action (GMFMC 2017a).

Year	ABC	ACL	ACT
2018	1,182,000	862,860	716,173
2019	1,489,000	1,086,970	902,185
2020+	1,794,000	1,309,620	1,086,985

Source: GMFMC (2017a)

Accountability measures (AM) put in place through Reef Fish Amendment 30A: Greater amberjack – revise rebuilding plan, accountability measures (GMFMC 2008) require that the Regional Administrator close the respective sector to further harvest of greater amberjack when the sector's ACT has been met or estimated to have been met, and to reduce that sector's ACL and ACT in the following year by the amount of any overage of the sector ACL. Overage adjustments resulting from these AMs have occurred in both the recreational and commercial sectors and have led to dramatically shortened fishing seasons in some years. Recreational sector landings, ACL adjustments and closure dates are shown in Table 1.1.2.

¹ <https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates>

Table 1.1.2. Recreational landings (pounds whole weight), ACTs, and ACLs from 2008 through 2019 for Gulf greater amberjack.

Year	Landings	ACT	Adjusted ACT	% ACT	ACL	Adjusted ACL	% ACL	Closure Date
2008	1,318,662			NA	1,368,000		96.4	
2009	1,480,315			NA	1,368,000		108.2	10/24/2009
2010	1,225,225			NA	1,368,000	1,243,184	105.9	
2011	949,999			NA	1,368,000	1,315,224	78.5	
2012	1,238,718	1,130,000		NA	1,299,000		96.7	
2013	1,620,761	1,130,000		NA	1,299,000		118.1	
2014	1,090,048	1,130,000	888,829	102.0	1,299,000	1,057,829	85.8	8/24/2014
2015	1,407,551	1,130,000		119.7	1,299,000		104.2	9/28/2015
2016	2,037,378	1,092,372	1,034,442	218.1	1,255,600	1,197,670	184.8	6/1/2016
2017	794,202	1,092,372	335,741	206.1	1,255,600	498,969	144.8	3/24/17
2017/2018*	622,011	716,173		86.9	862,860		72.1	None
2018/2019**	929,497	902,185		103.0	1,086,970		85.5	5/1/2019

* Landings from January 1 – January 27, 2018 and May 2018 (closed January 28 – April 30 and June 1 – July 31)

**2018/2019 landings are preliminary; Data presented for 2018/2019 are complete through May 30, 2019.

Source: See Appendix A.2 Data sources

The fishing year for most reef fish species is January 1 – December 31 (GMFMC 1981). As a result, many species are open to harvest on January 1 each year, but the season may be closed prior to year’s end if a species is subject to in-season monitoring and reaches its ACL or ACT before the end of the fishing year (GMFMC 2011). The result may be fewer reef fish species open to harvest later in the calendar year. This could be attributed to socioeconomic preferences, prevailing weather patterns, market conditions, or migratory patterns of some species and thus, may not allow maximum benefits to be realized from the reef fish resource. In 2017, the Council decided to open recreational fishing for greater amberjack later in the calendar year to improve fishermen’s access to greater amberjack and provide an opportunity to harvest a prized reef fish species during a period of the year when some other desirable species are prohibited from harvest (e.g., red snapper). Effective in 2018 (GMFMC 2017b), the recreational fishing year was modified from the calendar year to August 1 – July 31. Additionally, fixed closed seasons were established within the new fishing year from November 1 – April 30, and June 1 – July 31. This resulted in a fishing season that is potentially open August 1 through October 31 and May 1 – May 31, provided the ACT is not met before the end of the fishing year.

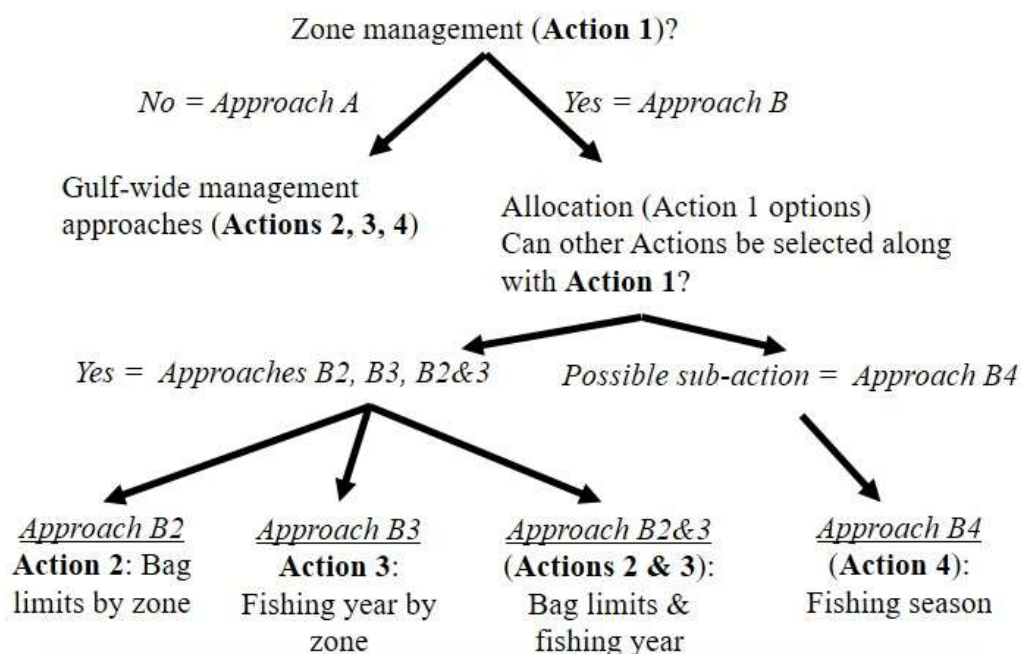
Although the Council intended the new fishing year and closed periods to provide both a fall and spring fishing season, recreational landings of Gulf greater amberjack during the 2018/2019 fall season met the ACT. As a result, harvest was closed for the remainder of the fishing year (i.e.,

through July 2019) and no harvest was allowed in 2018/2019 spring season.² During public comment, anglers from Florida through Alabama have expressed a preference for harvesting greater amberjack during the winter (January – February) and spring (May) while anglers from Texas, Louisiana, and Mississippi would like to harvest during the fall (September, October, November).

To address public concerns about the failure to have both a fall and spring open season for recreational Gulf greater amberjack harvest, the Council initiated development of this framework action to examine additional approaches to accomplish this management goal. The framework action includes alternatives for implementing fishing zones (Action 1), changing the bag and possession limits (Action 2), the fishing year (Action 3), and the fixed season closures (Action 4).

The recreational management measures being considered in the framework could also be combined using a number of approaches (Figure 1.1.1). Each of these potential approaches have associated trade-offs for achieving management goals. If a zone management approach is not selected, any modification to recreational bag limits, fishing season and year modifications would be Gulf-wide and each of these management measures could be combined with one another. If zone management is selected, options for allocating landings between zones would need to be considered using historical recreational landings, or daily catch rates, or some other mechanism. If zone management and allocation of recreational harvest is established, modifications to bag limits, fishing year, or a combination of bag limit and fishing year could also be implemented by zone. However, a zone management approach could not be combined with fixed season closures. This is because if a zone harvests the total ACL during their fishing season it would not be possible to allow for harvest in another zone.

² <https://www.fisheries.noaa.gov/bulletin/recreational-harvest-closures-greater-amberjack-and-gray-triggerfish-federal-waters>



Approach	Pro	Con
A: No to Action 1 zone management	Can extend season	Access region-dependent
B: Yes to Action 1 zone management	Improved access	Requires allocation & May shorten season
B2: Yes to Action 1 and Action 2 Modify bag limits by zone	Can extend season	Requires very reduced bag limits
B3: Yes to Action 1 and Action 3 Modify year by zone	Improved access	May shorten season
B2&3: Yes to Action 1 , Action 2 , & Action 3 Modify bag limits and year by zone	Can extend season	Complicated
B4: Yes to Action 1 & Action 4 Modify fishing season	Improved access	Cannot open a zone if other zone(s) harvested ACL

Figure 1.1.1. A decision tree outlining the possible approaches for modifying recreational management of greater amberjack using the proposed actions. Each potential management approach has a trade-off for achieving management goal.

1.2 Purpose and Need

The purpose of this framework action is to consider modifications to Gulf greater amberjack recreational management measures.

The need for this framework action is to improve recreational fishing opportunities throughout the Gulf while constraining harvest to management targets and rebuilding the Gulf greater amberjack stock.

1.3 History of Management

This history of management covers actions pertinent to the harvest of Gulf greater amberjack by the recreational sector. A complete history of management for the Reef Fish Fishery Management Plan (FMP) is available on the Council's website.³

The **Reef Fish FMP** (with environmental impact statement [EIS]) was implemented in November 1984. The original list of species included in the management unit consisted of snappers, groupers, and sea basses. Gray triggerfish and *Seriola* species, including greater amberjack, were in a second list of species included in the fishery, but not in the management unit. The species in this list were not considered to be target species, because they were generally taken incidentally to the directed fishery for species in the management unit. Their inclusion in the Reef Fish FMP was for purposes of data collection, and their take was not regulated.

Amendment 1 (with environmental assessment [EA]) implemented in 1990, added greater amberjack and lesser amberjack to the list of species in the management unit. It set a greater amberjack recreational minimum size limit of 28 inches fork length (FL), a 3-fish recreational bag limit, and a commercial minimum size limit of 36 inches FL. This amendment's objective was to stabilize the long-term population levels of all reef fish species. A framework procedure for specification of total allowable catch was created to allow for annual management changes. This amendment also established a commercial vessel permit for reef fish as a requirement for harvest in excess of the bag limit and for the sale of reef fish.

Amendment 5 (with supplemental EIS), implemented in 1994, required that all finfish, except for oceanic migratory species, be landed with head and fins attached, and closed the region of Riley's Hump (near Dry Tortugas, Florida) to all fishing during May and June to protect mutton snapper spawning aggregations.

Amendment 12 (with EA), submitted in 1995 and implemented in 1997, reduced the greater amberjack bag limit from three fish to one fish per person, and created an aggregate bag limit of 20 reef fish for all reef fish species not having a bag limit (including lesser amberjack, banded rudderfish, almaco jack, and gray triggerfish). The National Marine Fisheries Service (NMFS) disapproved proposed provisions to include lesser amberjack and banded rudderfish along with

³ http://www.gulfcouncil.org/fishery_management_plans/reef_fish_management.php

greater amberjack in an aggregate one-fish bag limit and to establish a 28-inch FL minimum size limit for those species.

Amendment 15 (with EA), implemented in 1998, established a fixed closed season for the commercial harvest of greater amberjack in the Gulf during the months of March, April, and May.

A Regulatory Amendment (with EA), implemented in 1999, created two marine reserves (i.e., closed two areas), 115 and 104 square nautical miles respectively, year-round to all fishing under the jurisdiction of the Council with a 4-year sunset clause.

Generic Sustainable Fisheries Act Amendment (with EA), partially approved and implemented in 1999, set the maximum fishing mortality threshold (MFMT) for greater amberjack at the fishing mortality necessary to achieve 30% of the unfished spawning potential ratio (SPR) $F_{30\% SPR}$. Estimates of maximum sustainable yield (MSY), minimum stock size threshold (MSST), and optimum yield (OY) were disapproved, because they were based on SPR proxies rather than biomass-based estimates.

Secretarial Amendment 2 (with EIS), implemented in 2003, specified MSY for greater amberjack as the yield associated with $F_{30\% SPR}$ (proxy for fishing mortality rate corresponding to an equilibrium yield of MSY [F_{MSY}]) when the stock is at equilibrium, optimum yield (OY) as the yield associated with an $F_{40\% SPR}$ when the stock is at equilibrium, maximum fishing mortality threshold MFMT equal to $F_{30\% SPR}$, and minimum stock size threshold MSST equal to $(1 - M) * B_{MSY}$ (where M = natural mortality and B_{MSY} = stock biomass level capable of producing an equilibrium yield of MSY) or 75% of B_{MSY} . It also set a rebuilding plan limiting the harvest to 2,900,000 lbs for 2003-2005, 5,200,000 lbs for 2006-2008, 7,000,000 lbs for 2009-2011, and for 7,900,000 lbs for 2012. This was expected to rebuild the stock in 7 years. Regulations implemented in 1997 and 1998 (Amendments 12 and 15 to the Reef Fish FMP) were deemed sufficient to comply with the rebuilding plan so no new regulations were implemented.

Amendment 30A (with EIS), implemented in 2008, was developed to stop overfishing of gray triggerfish and greater amberjack. The amendment established ACLs and AMs for greater amberjack and gray triggerfish. For greater amberjack, the rebuilding plan was modified, increasing the recreational minimum size limit to 30 inches FL, implementing a zero bag limit for captain and crew of for-hire vessels, and setting commercial and recreational ACTs.

Amendment 30A also established an allocation for greater amberjack harvest of 73% recreational and 27% commercial, which would be in effect until such time that the Council, through the recommendations of an Ad Hoc Allocation Committee, could implement a separate amendment that fairly and equitably allocated Reef Fish FMP resources between recreational and commercial sectors.

A Regulatory Amendment (with EA), implemented in 2011, specified the greater amberjack recreational closed season from June 1 – July 31. The intended effect of this final rule was to mitigate the social and economic impacts associated with implementing in-season closures.

Amendment 35 (with EA), implemented in 2012 in response to a 2010 update stock assessment, established a new ACL equal to the ABC at 1,780,000 lbs, which was less than the current ACL of 1,830,000 lbs. Reducing the ABC by 18% was expected to end overfishing. The rule also established a commercial trip limit of 2,000 lbs whole weight (ww) throughout the fishing year. The Council also considered bag limits and closed season management measures for the recreational sector but did not alter any recreational management measures.

2015 Framework Action (with EA), implemented in 2016 decreased the total ACL from 1,780,000 lbs to 1,720,000 lbs, set the commercial ACL at 464,400 lbs and the commercial ACT at 394,740 lbs, set the recreational ACL at 1,255,600 lbs and the recreational ACT at 1,092,372 lbs, reduced the commercial trip limit from 2,000 lbs to 1,500 lbs, and increased the recreational minimum size limit from 30 inches FL to 34 inches FL (GMFMC 2016).

Amendment 44 (with EA), was implemented in December 21, 2017. This amendment changed the minimum stock size threshold for seven species in the Reef Fish FMP, including greater amberjack. After the approval of Amendment 44, the greater amberjack stock was still classified as overfished and undergoing overfishing.

The Council approved two framework actions in 2017 that addressed management of Gulf greater amberjack. **Modifications to Greater Amberjack Allowable Harvest and Rebuilding Plan** (with EA) was implemented on January 27, 2018 (GMFMC 2017a). The action set the sector-specific ACLs and ACTs for 2018 to 2020 and beyond. In addition, this framework action modified the fixed season closure for the recreational sector to be January 1 through June 30 each year.

Modifications to the Greater Amberjack Fishing Year and the Recreational Fixed Closed Season (with EA; GMFMC 2017b). This action modified the recreational fishing year to begin on August 1 and run through July 31 of the following year. It also modified the fixed closed season so that recreational harvest is prohibited from November 1 – April 30 and June 1 – July 31. The final rule was effective April 30, 2018.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1– Establish Greater Amberjack Recreational Fishing Zones and Quotas

Alternative 1: No Action – Do not establish recreational fishing zones. Retain a single annual catch limit (ACL) and annual catch target (ACT) for the recreational harvest of greater amberjack throughout the Gulf of Mexico (Gulf).

Alternative 2: Establish two zones. A **Western Zone** (Texas, Louisiana, Mississippi) and **Eastern Zone** (Alabama, Florida) and allocate a quota of the total ACT between zones based on:

Option a: historical landings (years TBD).

Option b: daily catch rates (years TBD).

Alternative 3: Establish three zones. A **Western Zone** (Texas, Louisiana, Mississippi), **Northern Zone** (Alabama to Florida Dixie/Levy county line), and **Southern Zone** (south of Florida Dixie/Levy county line through Monroe County) and allocate a quota of the total ACT between zones based on:

Option a: historical landings (years TBD).

Option b: daily catch rates (years TBD).

Discussion

The greater amberjack recreational component of the Gulf reef fish fishery has been subject to multiple management measures such as quota closures, paybacks, increased size limits, seasonal closures, and a change in the fishing year to prolong the fishing season (see History of Management). However, the recreational sector has continued to meet or exceed its annual catch target (ACT) resulting in in-season closures and in some years, a payback (Table 1.1.2). Since these traditional management approaches are not achieving management goals of improved access to the fishery when each area in the Gulf prefers to fish and extending season length, zone management is being considered for recreational greater amberjack. One purpose of this action is to prevent one area from harvesting most, if not all, of the ACT before other areas begin fishing for greater amberjack. Another purpose is to allow the ability to apply paybacks to the specific zone that had an overage. Lastly, having zones may allow for-hire fishermen to better set their recreational seasons.

The proposed zones are based on a number of factors such as Mississippi’s federal water access, reported recreational harvest seasonality, and Marine Recreational Information Program (MRIP)/Southeast Regional Headboat Survey (SRHS) grid lines in Florida (Figure 2.1.1). The Western and Eastern (**Alternative 2**) and Western and Northern (**Alternative 3**) zone delineation lines were selected at the Mississippi/Alabama state line to account for Mississippi’s constrained federal water access through Louisiana’s state waters. Furthermore, confidential headboat landings between Louisiana and Mississippi prevent listing headboat landings separately per these state and therefore make a zone split between these states impracticable without imposing more uncertainty in landings. Public testimony and Gulf of Mexico Fishery Management Council (Council) discussion indicated that there is variable seasonal harvest of greater amberjack throughout the Gulf and that

“zoning” may already be occurring due to preference in harvest timelines. The western Gulf greater amberjack recreational fishery is mainly a fall fishery, while the eastern Gulf greater amberjack recreational fishery is primarily a winter through spring fishery. The eastern Gulf greater amberjack fishery can be further broken down (**Alternative 3**). The northern part of the eastern Gulf tends to fish in the spring/summer whereas the southern part of the eastern Gulf tends to fish in the winter/spring. MRIP/SRHS data collection is broken into grids, which provide an optimal delineation line for the seasonal harvest preference, between SRHS grid 21 and 23 (Dixie/Levy County, Florida line). Choosing a Northern/Southern Zone division (**Alternative 3**) at this data collection line also reduces uncertainty in Florida’s harvest by not splitting landings per a grid. In addition, a zone division at the Dixie/Levy County, Florida line should not result in a significant amount of crossover (fishermen fishing in both zones) because of the geographical distance between major harvesting areas. Another option for west Florida that does not split recreational landings data would be a zone delineation at the Monroe/Collier County, Florida line. With historical landings south of Dixie County, Florida only comprising an average of up to 20%, further breaking these landings down for a Southern Zone that was only comprised of Monroe County, Florida in the Gulf did not seem practicable.

If Gulf recreational greater amberjack zones are selected, it will need to be determined as to how the quota allocation of the ACT should be split between those zones. While **Option a**, by historical landings, and **Option b**, by daily catch rates, are presented, further detail as to how these options will be achieved will need to be determined. For example, what years should be analyzed for determining a quota percentage per zone by using historical landings? How would the daily catch rates be used to decide the allocation? Or possibly another allocation mechanism not yet identified could be considered as another option? All alternatives would retain the recreational ACL and ACT set with the 2017 Framework (GMFMC 2017a) using the 2020 and beyond ACL of 1,309,620 lbs whole weight (ww) and an ACT of 1,086,985 lbs ww for the start of the fishing year, however, **Alternatives 2 and 3** would allocate a quota of the ACT for each zone. With the total ACL across the Gulf being retained, further discussion is needed to determine if the fishing year could stay open if the total ACL has already been exceeded, even if a specific zone did not reach their quota. Could the ACL also be apportioned for each zone as a quota as is proposed for the ACT? In addition, there may be other considerations, such as socioeconomic needs and reliance, which should be prioritized for apportionment of the ACT. Lastly, consideration of whether other management measures, such as the current bag limit and fishing year, should stay consistent across the Gulf or if they should be different per zone.

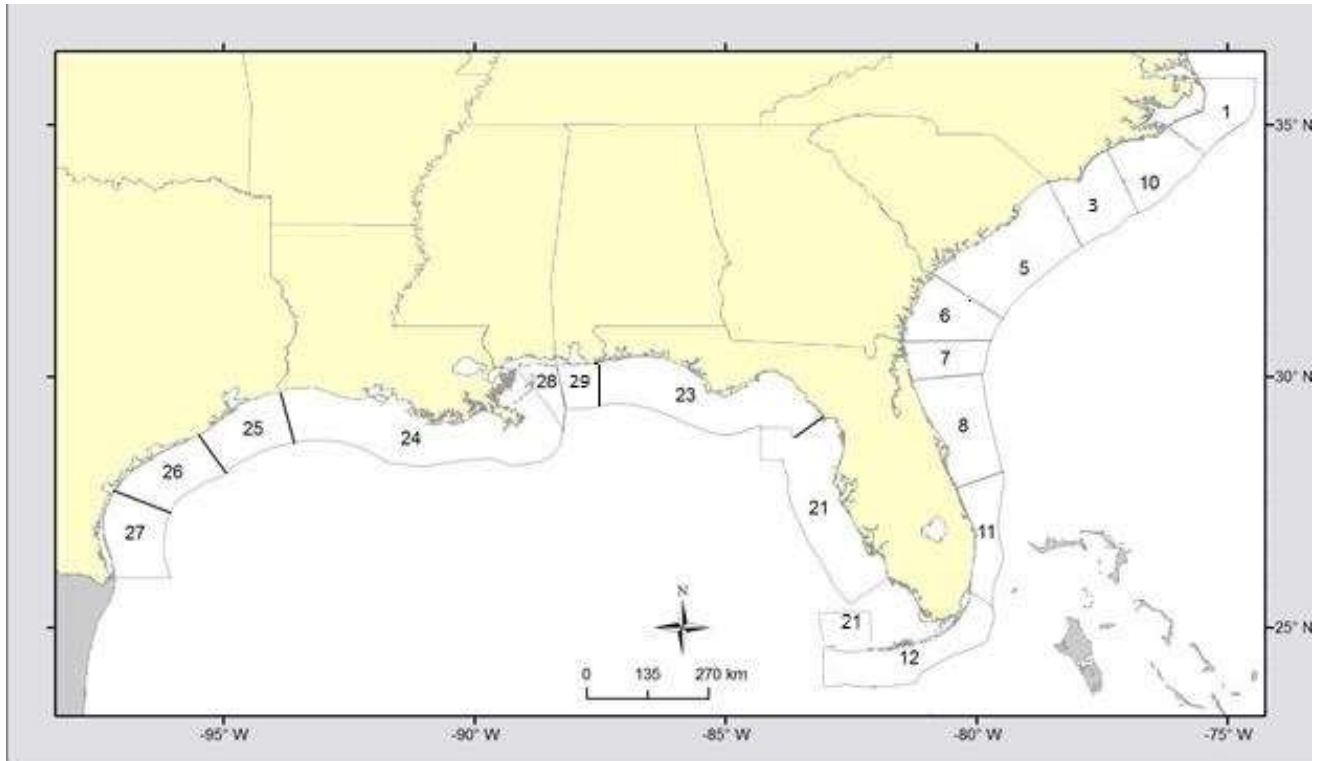


Figure 2.1.1. Map of SRHS data collection grids. MRIP data collection also separated by these grids.

Alternative 1 would continue a Gulf wide recreational ACL and ACT (Figure 2.1.2) and management measures. Recreational closures occurred from 2014 to 2017 (Table 1.1.2) and landings have varied by state and year (Table 2.1.1). A closure did not occur in 2017/2018 due to the implementation of two framework actions (GMFMC 2017a and 2017b). First, a recreational seasonal closure for January through June was effective on January 27, 2018, closing recreational fishing at that point. On April 30, 2018, the recreational fishing year was changed to August to July and the recreational seasonal closure was modified to be November through April and June through July. The 2018 ACL was then applied to the 2017/2018 recreational fishing year. Since the 2017 fishing season closed on March 24, 2017 until December 31, 2017, the 2017/2018 season was only open for 52 days (January 1 until January 27 and then during May for the new spring season). A closure occurred at the end of the 2018/2019 fishing year fall season, which did not allow for a spring season.

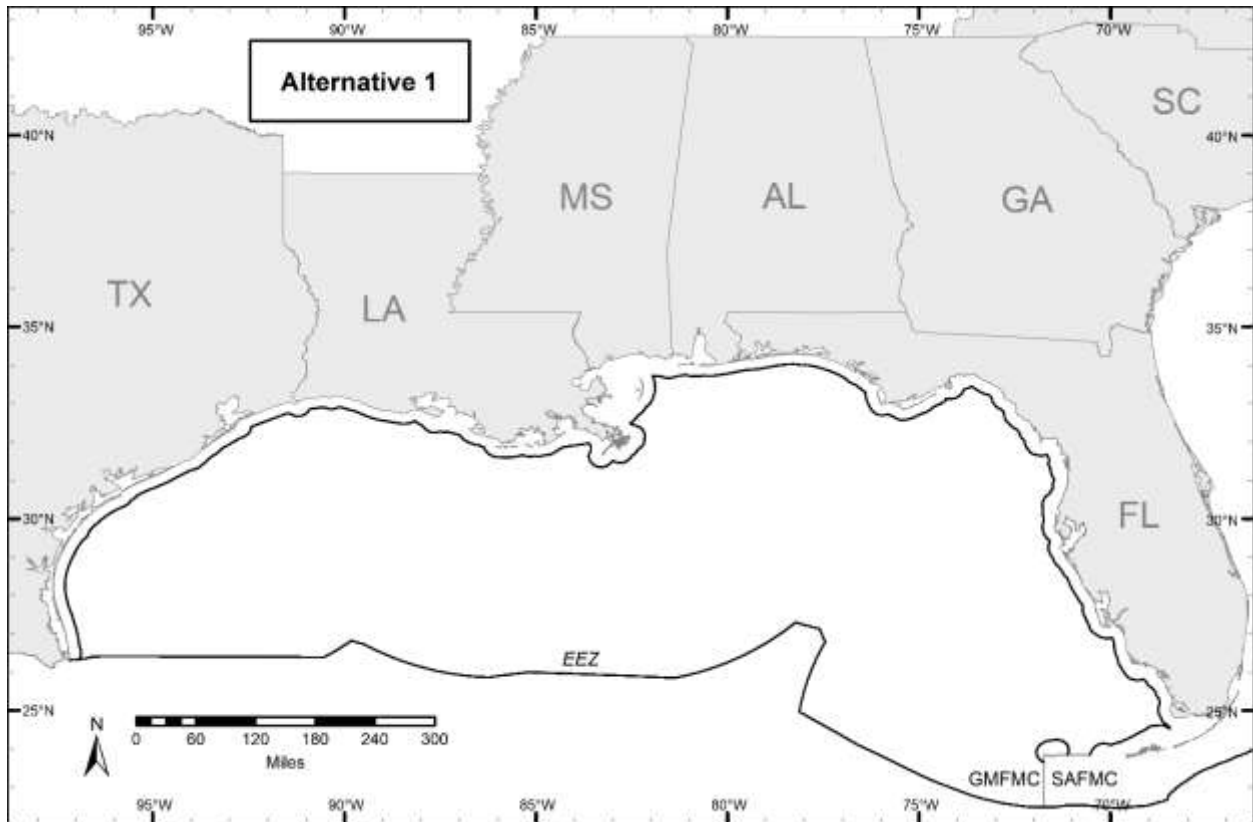


Figure 2.1.2. Map of **Alternative 1** with no zone division. This alternative would maintain a Gulf-wide recreational ACL and ACT for greater amberjack.

Table 2.1.1. Greater amberjack recreational landings from 2009-2018 in lbs whole weight (ww) by calendar year and state with associated total yearly landings.

Year	AL	AL/ FLW	FLW	LA	LA/ MS	MS	TX	Total
2009	43,142	57,566	925,430	442,919	27,246	20,102	21,011	1,537,416
2010	85,324	33,860	1,005,557	79,532	2,485	0	22,294	1,229,052
2011	64,888	39,201	796,628	9,057	7,986	0	18,577	936,337
2012	57,725	66,054	899,070	244,235	10,390	0	28,138	1,305,612
2013	173,444	-	1,186,416	230,047	7,262	11,679	30,420	1,639,268
2014	162,769	-	844,402	158,356	6,942	4,995	30,700	1,208,163
2015	269,695	-	1,059,442	126,101	6,797	0	30,193	1,492,228
2016	259,604	-	1,455,836	207,523	994	100,106	13,316	2,037,378
2017	173,290	-	576,002	11,056	0	13,071	20,782	794,202
2018	403,826	-	670,282	355,878	4,136	15,968	43,435	1,493,525

Note: Prior to 2013, headboat landings could not be separated between Alabama and west Florida due to confidentiality; therefore, headboat landings for these states have a combined column. After 2013, Alabama and west Florida headboats landings could be separated due to no longer being confidential. Therefore, after 2013 the Alabama and west Florida headboat landings are listed per associated state and added to the private and charter landings per state. Louisiana and Mississippi individual column landings are private and charter combined only. LA/MS column is headboat only. The headboat data from Mississippi is confidential at the state level and therefore must be combined with Louisiana. Texas landings combine private, charter, and headboat for all years.

Source: Recreational ACL file released July 25, 2019.

Alternative 2 would divide the Gulf into two zones along the Mississippi/Alabama state line creating a proposed Western Zone comprising Texas, Louisiana, and Mississippi and a proposed Eastern Zone comprising Alabama and Florida to the Gulf and South Atlantic Fishery Management Council boundary. (Figure 2.1.3). Under **Alternative 2**, the overall recreational ACL and ACT set with the 2017 Framework (GMFMC 2017a) would remain in effect. However, upon implementation of the final rule, the current ACT of 1,086,985 lbs ww would be divided by some apportionment between the proposed Western and Eastern Zones.

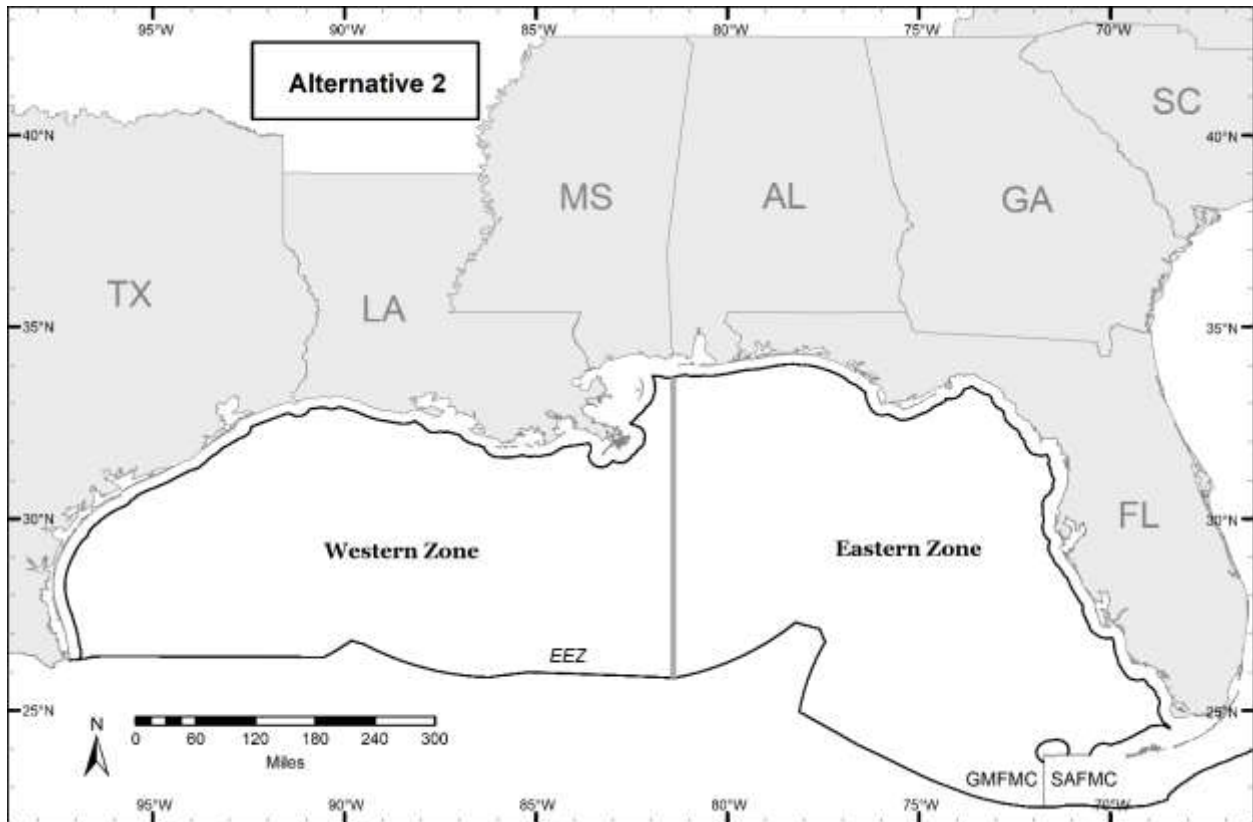


Figure 2.1.3. Map of **Alternative 2**, which would divide the Gulf along the Mississippi and Alabama border. A recreational ACT for greater amberjack would be allocated between the proposed Western (Texas, Louisiana, and Mississippi) and Eastern zones (Alabama and Florida).

Alternative 2 Option a would require the Council to determine a quota of the ACT for each zone, based on historical yearly landings. Landings have been variable between zones by waves due to fishery closures, seasonal closures, and changes to the size limit. From 2009-2018, the proposed Western Zone harvested an average of 16% (range 4-33%) of the calendar year total harvest while the proposed Eastern Zone harvested an average of 84% (range 67-96%). However, there have been multiple waves where harvest was zero due to the fishery being closed during the entire wave, reduced due to a closure mid-wave, or reduced due to the oil spill and subsequent fishery area closure in 2010 (Table 2.1.2, 2.1.3, and Figure 2.1.4). The reduced landings in 2010 were more prominent in the proposed Western Zone where a fishery closure was implemented for two of the three states. Due to the seasonal preferences in harvest, yearly total landings may not accurately reflect how much fish each zone would land if a closure did not occur before fishing year-end. However, concern about earlier closures in recent years may have caused a shift in fishermen behavior, resulting in fishing at the season start even if not their preferred time to fish. On the other hand, when earlier historical landings are analyzed (1992-2008), which was before multiple management measures were implemented, the proposed Western Zone still harvested on average 20% of the calendar year total harvest and the proposed Eastern Zone harvested an average of 80%. The percentages stayed the same even when landings were broken down by wave. This may mean that regardless of when the fishery is open, or what management measures or implemented, each of these two zones are anticipated to harvest the same yearly amount. However, if a derby-style fishery has developed,

Alternative 2 could help alleviate this by allowing stakeholders in each zone to fish during their preferred time of the year. Furthermore, assigning a separate quota for each zone could hold a zone accountable for any overage because any payback would be attributed to the zone that exceeded its apportionment. Further examination of federal regulations will be completed to see individual apportionments of the ACL could be implemented, as it may not be possible to allow fishing in any zone if the total ACL has been harvested. Lastly, establishing zones may allow for-hire operators to better set their client season reservations due to the more likely possibility of having quota available for their preferred time during the fishing season.

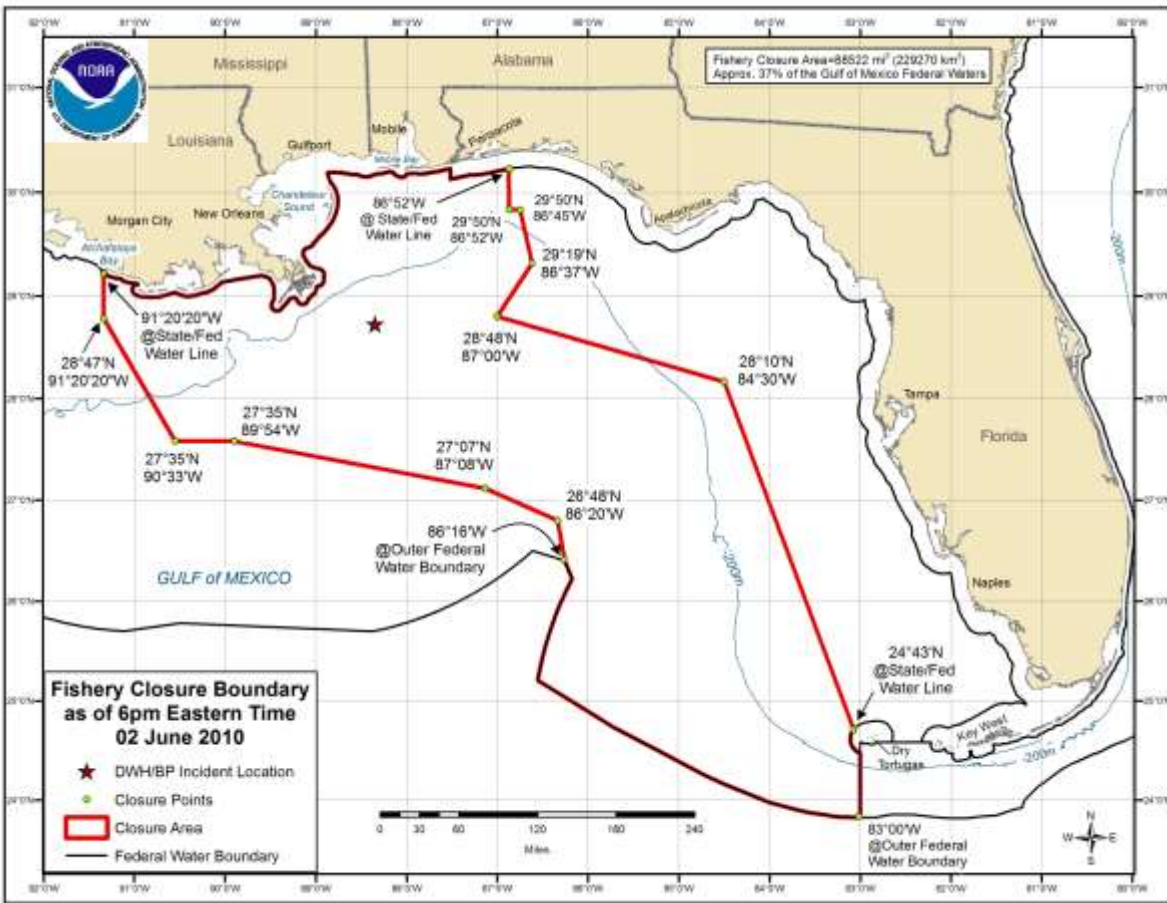


Figure 2.1.4. Maximum fishery closure at the height of the Deepwater Horizon MC252 oil spill. This max extent of the closure was effective from June 2, 2010 until June 4, 2010; however, areas surrounding the incident location off Louisiana, Mississippi, and Alabama were closed from May 2, 2010 until September 2, 2010 and off some portions of Louisiana starting at the federal water boundary until November 15, 2010. The last area of closed federal waters immediately surrounding the incident location did not reopen until April 19, 2011.

Table 2.1.2. Greater amberjack recreational landings from 2009-2018 in lbs ww by calendar year per wave for the proposed **Western Zone** (Texas, Louisiana, and Mississippi) with associated annual landings.

Year	Wave						Total
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec	
2009	161,286	52,965	112,562	166,844	17,621	0	511,278
2010	5,699	53,505	5,206	12,942	25,953	1,006	104,311
2011 ^a	2,878	8,527	4,134	10,825	7,962	1,293	35,620
2012	7,264	171,338	8,956	28,333	33,560	33,313	282,763
2013 ^b	19,684	105,612	78,330	14,728	57,878	3,175	279,408
2014	8,686	10,528	53,060	128,212	507	0	200,993
2015	16,232	37,201	34,746	52,794	22,117	0	163,091
2016 ^c	13,869	134,629	169,239	4,202	0	0	321,938
2017	21,454	19,144	627	3,685	0	0	44,910
2018 ^d	4,565	0	129,117	196,570	88,643	522	419,417

Yellow cells-recreational sector closed partially in a wave.

Red cells-recreational sector closed every day of the wave.

Gray cells-recreational landings reduced from 2010 oil spill and area closure.

^aJune-July seasonal closure implemented

^bACL reduced and an ACT implemented

^cSize limit increased from 30-34 in FL and ACL and ACT were further reduced

^dA seasonal closure of January 1 – June 30 was effective from January 27 – April 30, 2018 (GAJ #1 Framework). 2017 fishing was closed from March 24 – December 31. Landings for 2017 were from 1/1/7-3/23/17. A seasonal closure of Nov 1 – Apr 30 and Jun 1 – Jul 31 and fishing year of August to July was implemented in April 2018 with GAJ #2 Framework. Only landings from 1/1/18-1/26/18 and 5/1/18-5/31/18 were attributed to the 2017/2018 fishing year. August in Wave 4 for 2018 started the 2018/2019 fishing year.

Note: Landings shown in months when the recreational sector was closed are attributed to MRIP interviews where a greater amberjack was harvested.

Source: Recreational ACL file released July 25, 2019.

Table 2.1.3. Greater amberjack recreational landings from 2009-2018 in lbs ww by calendar year per wave for the proposed **Eastern Zone** (Alabama and Florida) with associated annual landings.

Year	Wave						Total
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec	
2009	49,262	36,659	553,847	305,923	80,290	156	1,026,138
2010	64,197	223,071	514,628	79,361	179,687	63,797	1,124,741
2011 ^a	57,691	103,476	179,105	232,050	273,206	55,190	900,717
2012	112,185	276,423	223,942	139,680	172,780	97,839	1,022,849
2013 ^b	13,367	322,967	228,183	356,920	402,227	36,196	1,359,860
2014	86,470	256,107	168,204	448,189	46,670	1,529	1,007,170
2015	15,327	425,665	237,989	484,020	165,936	200	1,329,137
2016 ^c	217,968	1,180,443	299,139	16,726	26	1,138	1,715,440
2017	399,798	307,400	35,831	5,921	287	55	749,292
2018 ^d	32,793	0	387,625	175,375	478,420	0	1,074,214

Yellow cells-recreational sector closed partially in a wave.

Red cells-recreational sector closed every day of the wave.

Gray cells-recreational landings reduced from 2010 oil spill and area closure.

^aJune-July seasonal closure implemented

^bACL reduced and an ACT implemented

^cSize limit increased from 30-34 in FL and ACL and ACT were further reduced

^dA seasonal closure of January 1 – June 30 was effective from January 27 – April 30, 2018 (GAJ #1 Framework). 2017 fishing was closed from March 24 – December 31. Landings for 2017 were from 1/1/7-3/23/17. A seasonal closure of Nov 1 – Apr 30 and Jun 1 – Jul 31 and fishing year of August to July was implemented in April 2018 with GAJ #2 Framework. Only landings from 1/1/18-1/26/18 and 5/1/18-5/31/18 were attributed to the 2017/2018 fishing year. August in Wave 4 for 2018 started the 2018/2019 fishing year.

Note: Landings shown in months when the recreational sector was closed are attributed to MRIP interviews where a greater amberjack was harvested.

Source: Recreational ACL file released July 25, 2019.

Alternative 2 Option b would require the Council to allocate a quota of the ACT to each zone based on historical daily catch rates. The same variability in landings affects **Alternative 2 Option b** as in **Alternative 2 Option a**. From 2009-2018, the proposed Western Zone harvested an average of 1,557 lbs ww per day (range 137-4,851 lbs ww per day) excluding days where the wave was closed. The proposed Eastern Zone harvested an average of 7,139 lbs ww per day (range 3,076-13,056 lbs ww per day) excluding days where the wave was closed (Table 2.1.4 and 2.1.5). However, daily catch rate estimation is confounded by frequent in-season closures in recent years that make it difficult to predict daily catch rates during months with little historic landings information. Like **Alternative 2 Option a**, **Alternative 2 Option b** could help alleviate a possible derby-style fishery and would hold each zone accountable for any overage of their quota that would occur. **Alternative 2 Option b** may also allow for-hire operators to better set their client season reservations.

Table 2.1.4. Greater amberjack recreational daily catch rates from 2009-2018 in lbs ww by calendar year per wave for the proposed **Western Zone** (Texas, Louisiana, and Mississippi).

Year	Wave					
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
2009	2,734	868	1,845	2,691	326	0
2010	97	877	85	209	425	16
2011 ^a	49	140	133	349	131	21
2012	121	2,809	289	914	550	546
2013 ^b	334	1,731	2,527	475	949	52
2014	147	173	1,712	5,128	0	0
2015	275	610	1,121	1,703	790	0
2016 ^c	231	2,207	5,459	0	0	0
2017	364	798	0	0	0	0
2018 ^d	169	0	4,165	6,341	1,453	0

Yellow cells-recreational sector closed partially in a wave.

Red cells-recreational sector closed every day of the wave.

Gray cells-recreational landings reduced from 2010 oil spill and area closure.

^aJune-July seasonal closure implemented

^bACL reduced and an ACT implemented

^cSize limit increased from 30-34 in FL and ACL and ACT were further reduced

^dA seasonal closure of January 1 – June 30 was effective from January 27 – April 30, 2018 (GAJ #1 Framework). 2017 fishing was closed from March 24 – December 31. Landings for 2017 were from 1/1/7-3/23/17. A seasonal closure of Nov 1 – Apr 30 and Jun 1 – Jul 31 and fishing year of August to July was implemented in April 2018 with GAJ #2 Framework. Only landings from 1/1/18-1/26/18 and 5/1/18-5/31/18 were attributed to the 2017/2018 fishing year. August in Wave 4 for 2018 started the 2018/2019 fishing year.

Note: Landings for months when the recreational sector was closed are assumed to be zero even though yearly landings show greater amberjack harvest occurred.

Source: Recreational ACL file released July 25, 2019.

Table 2.1.5. Greater amberjack recreational daily catch rates from 2009-2018 in lbs whole weight (ww) by calendar year per wave for the proposed **Eastern Zone** (Alabama and Florida).

Year	Wave					
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
2009	835	601	9,079	4,934	1,487	0
2010	1,088	3,657	8,437	1,280	2,946	1,046
2011 ^a	978	1,696	5,778	7,485	4,479	905
2012	1,870	4,532	7,224	4,506	2,832	1,604
2013 ^b	227	5,295	7,361	11,514	6,594	593
2014	1,466	4,198	5,426	17,928	0	0
2015	260	6,978	7,677	15,614	5,926	0
2016 ^c	3,633	19,352	9,650	0	0	0
2017	6,776	12,808	0	0	0	0
2018 ^d	1,215	0	12,504	5,657	7,843	0

Yellow cells-recreational sector closed partially in a wave.

Red cells-recreational sector closed every day of the wave.

Gray cells-recreational landings reduced from 2010 oil spill and area closure.

^aJune-July seasonal closure implemented

^bACL reduced and an ACT implemented

^cSize limit increased from 30-34 in FL and ACL and ACT were further reduced

^dA seasonal closure of January 1 – June 30 was effective from January 27 – April 30, 2018 (GAJ #1 Framework). 2017 fishing was closed from March 24 – December 31. Landings for 2017 were from 1/1/7-3/23/17. A seasonal closure of Nov 1 – Apr 30 and Jun 1 – Jul 31 and fishing year of August to July was implemented in April 2018 with GAJ #2 Framework. Only landings from 1/1/18-1/26/18 and 5/1/18-5/31/18 were attributed to the 2017/2018 fishing year.

August in Wave 4 for 2018 started the 2018/2019 fishing year.

Note: Landings for months when the recreational sector was closed are assumed to be zero even though yearly landings show greater amberjack harvest occurred.

Source: Recreational ACL file released July 25, 2019.

Alternative 3 would retain the same proposed Western Zone as described for **Alternative 2**; however, the Eastern Zone would further be divided into new proposed Northern and Southern Zones (Figure 2.1.5). This additional division of the proposed Eastern Zone may be desirable because the northern part tends to fish in the spring/summer whereas the southern part tends to fish in the winter/spring. Based on recreational seasonal harvest preference and the MRIP/SRHS designation lines in Florida, a dividing line between the Northern and Southern Zones was selected at the Florida Dixie/Levy County line. Therefore, the proposed Western Zone would include Texas, Louisiana, Mississippi; the proposed Northern Zone would include Alabama to Florida Dixie/Levy County line; and the proposed Southern Zone would include south of Florida Dixie/Levy County line to the Gulf and South Atlantic Council boundary (through Monroe County, Florida). Under **Alternative 3**, the overall recreational ACL and ACT set with the 2017 Framework (GMFMC 2017a) would remain in effect. However, starting in 2020 the ACT of 1,086,985 lbs ww would be divided by some apportionment between the proposed Western, Northern, and Southern Zones. **Alternative 3 Option a** would require the Council to allocate a quota of the ACT to each zone, based on historical yearly landings. From 2009-2018, the proposed Western Zone harvested an average of 16% (range 4-33%) of the calendar year total harvest, the proposed Northern Zone harvested an average of 68% (range 52-79%), and the proposed Southern Zone harvested an average of 16% (range 4-30%). As seen in **Alternative 2**, there have been multiple waves where harvest was zero due to the fishery being closed

during the entire wave, reduced due to a closure mid-wave or reduced due to the oil spill and area closure in 2010 (Table 2.1.2, 2.1.6, 2.1.7, and Figure 2.1.4). Furthermore, when earlier historical landings are analyzed for **Alternative 3** (1992-2008), the proposed Western Zone harvested 10-20% of the calendar year total harvest, the proposed Northern Zone harvested 60-70%, and the proposed Southern Zone harvested up to 20%. The percentages varied slightly when landings were broken down by wave: Western- 10-20%, Northern- 55-75%, and Southern- 8-35%. The same considerations mentioned for **Alternative 2** regarding fishing behavior and possible outcomes of implementing zones apply for **Alternative 3** as well, although these outcomes may be more pronounced due to adding another zone.

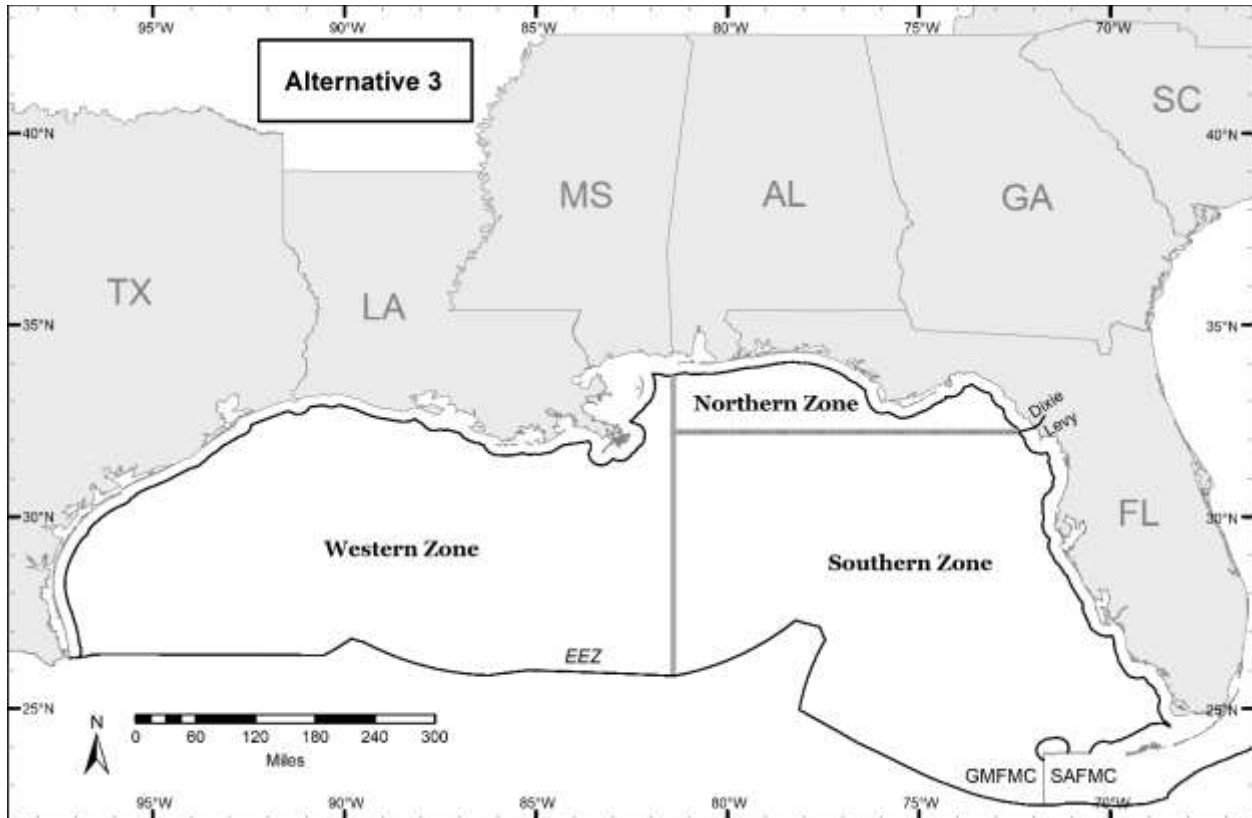


Figure 2.1.5. Map of **Alternative 3**, which would divide the Gulf along the Mississippi and Alabama border as well as along the Dixie and Levy County line in FL. A recreational ACT for greater amberjack would be allocated between the proposed Western (Texas, Louisiana, and Mississippi), Northern (Alabama to the Florida Dixie/Levy county line), and Southern zones (south of Florida Dixie/Levy County line through Monroe County).

Table 2.1.6. Greater amberjack recreational landings from 2009-2018 in lbs whole weight (ww) by calendar year per wave for the proposed **Northern Zone** (Alabama to Florida Dixie/Levy County line) with associated annual landings.

Year	Wave						Total
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec	
2009	828	23,957	530,084	296,666	67,371	156	919,062
2010	25,593	127,289	384,271	52,534	129,535	38,285	757,507
2011 ^a	397	46,961	169,669	206,665	256,305	31,944	711,941
2012	38,112	241,134	218,536	104,718	168,002	94,265	864,767
2013 ^b	2,294	319,423	222,160	355,241	377,934	14,863	1,291,915
2014	57,641	182,098	150,659	333,255	46,670	0	770,323
2015	7,942	305,429	229,328	476,917	164,512	200	1,184,328
2016 ^c	196,108	1,075,994	217,552	16,726	26	147	1,506,553
2017	216,733	258,810	35,831	5,921	17	0	517,312
2018 ^d	386	0	289,322	170,256	321,403	0	781,367

Yellow cells-recreational sector closed partially in a wave.

Red cells-recreational sector closed every day of the wave.

Gray cells-recreational landings reduced from 2010 oil spill and area closure.

^aJune-July seasonal closure implemented

^bACL reduced and an ACT implemented

^cSize limit increased from 30-34 in FL and ACL and ACT were further reduced

^dA seasonal closure of January 1 – June 30 was effective from January 27 – April 30, 2018 (GAJ #1 Framework). 2017 fishing was closed from March 24 – December 31. Landings for 2017 were from 1/1/7-3/23/17. A seasonal closure of Nov 1 – Apr 30 and Jun 1 – Jul 31 and fishing year of August to July was implemented in April 2018 with GAJ #2 Framework. Only landings from 1/1/18-1/26/18 and 5/1/18-5/31/18 were attributed to the 2017/2018 fishing year. August in Wave 4 for 2018 started the 2018/2019 fishing year.

Note: Landings shown in months when the recreational sector was closed are attributed to MRIP interviews where a greater amberjack was harvested.

Source: Recreational ACL file released July 25, 2019.

Table 2.1.7. Greater amberjack recreational landings from 2009-2018 in lbs whole weight (ww) by calendar year per wave for the proposed **Southern Zone** (south of Florida Dixie/Levy County line through Monroe County) with associated annual landings.

Year	Wave						Total
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec	
2009	48,435	12,702	23,763	9,258	12,919	0	107,077
2010	38,604	95,782	130,357	26,826	50,152	25,513	367,234
2011 ^a	57,294	56,516	9,436	25,385	16,900	23,246	188,777
2012	74,074	35,289	5,406	34,962	4,778	3,575	158,084
2013 ^b	11,074	3,543	6,023	1,679	24,293	21,332	67,944
2014	28,829	74,009	17,545	114,935	0	1,529	236,847
2015	7,386	120,236	8,661	7,103	1,424	0	144,810
2016 ^c	21,860	104,448	81,586	0	0	991	208,885
2017	183,065	48,591	0	0	270	55	231,981
2018 ^d	32,407	0	98,303	5,120	157,017	0	292,847

Yellow cells-recreational sector closed partially in a wave.

Red cells-recreational sector closed every day of the wave.

Gray cells-recreational landings reduced from 2010 oil spill and area closure.

^aJune-July seasonal closure implemented

^bACL reduced and an ACT implemented

^cSize limit increased from 30-34 in FL and ACL and ACT were further reduced

^dA seasonal closure of January 1 – June 30 was effective from January 27 – April 30, 2018 (GAJ #1 Framework). 2017 fishing was closed from March 24 – December 31. Landings for 2017 were from 1/1/7-3/23/17. A seasonal closure of Nov 1 – Apr 30 and Jun 1 – Jul 31 and fishing year of August to July was implemented in April 2018 with GAJ #2 Framework. Only landings from 1/1/18-1/26/18 and 5/1/18-5/31/18 were attributed to the 2017/2018 fishing year. August in Wave 4 for 2018 started the 2018/2019 fishing year.

Note: Landings shown in months when the recreational sector was closed are attributed to MRIP interviews where a greater amberjack was harvested.

Source: Recreational ACL file released July 25, 2019.

Alternative 3 Option b would require the Council to allocate a quota of the ACT to each zone, based on historical daily catch rates. From 2009-2018, the proposed Western Zone harvested an average of 1,557 lbs ww per day (range 137-4,851 lbs ww per day) excluding days where the wave was closed. The proposed Northern Zone harvested an average of 5,821 lbs ww per day (range 3,026-11,170 lbs ww per day), and the proposed Southern Zone harvested an average of 1,318 lbs ww per day (range 207-3,418 lbs ww per day) excluding days where the wave was closed (Table 2.1.4, 2.1.8, and 2.1.9).

Table 2.1.8. Greater amberjack daily catch rates from 2009-2018 in lbs whole weight (ww) by calendar year per wave for the proposed **Northern Zone** (Alabama to Florida Dixie/Levy County line).

Year	Wave					
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
2009	14	393	8,690	4,785	1,248	0
2010	434	2,087	6,300	847	2,124	628
2011 ^a	7	770	5,473	6,667	4,202	524
2012	635	3,953	7,050	3,378	2,754	1,545
2013 ^b	39	5,236	7,166	11,459	6,196	244
2014	977	2,985	4,860	13,330	0	0
2015	135	5,007	7,398	15,384	5,875	0
2016 ^c	3,268	17,639	7,018	0	0	0
2017	3,673	10,784	0	0	0	0
2018 ^d	14	0	9,333	5,492	5,269	0

Yellow cells-recreational sector closed partially in a wave.

Red cells-recreational sector closed every day of the wave.

Gray cells-recreational landings reduced from 2010 oil spill and area closure.

^aJune-July seasonal closure implemented

^bACL reduced and an ACT implemented

^cSize limit increased from 30-34 in FL and ACL and ACT were further reduced

^dA seasonal closure of January 1 – June 30 was effective from January 27 – April 30, 2018 (GAJ #1 Framework). 2017 fishing was closed from March 24 – December 31. Landings for 2017 were from 1/1/7-3/23/17. A seasonal closure of Nov 1 – Apr 30 and Jun 1 – Jul 31 and fishing year of August to July was implemented in April 2018 with GAJ #2 Framework. Only landings from 1/1/18-1/26/18 and 5/1/18-5/31/18 were attributed to the 2017/2018 fishing year. August in Wave 4 for 2018 started the 2018/2019 fishing year.

Note: Landings for months when the recreational sector was closed are assumed to be zero even though yearly landings show greater amberjack harvest occurred.

Source: Recreational ACL file released July 25, 2019.

Table 2.1.9. Greater amberjack recreational daily catch rates from 2009-2018 in lbs whole weight (ww) by calendar year per wave for the proposed **Southern Zone** (south of Florida Dixie/Levy County line through Monroe County).

Year	Wave					
	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
2009	821	208	390	149	239	0
2010	654	1,570	2,137	433	822	418
2011 ^a	971	926	304	819	277	381
2012	1,235	579	174	1,128	78	59
2013 ^b	188	58	194	54	398	350
2014	489	1,213	566	4,597	0	0
2015	125	1,971	279	229	51	0
2016 ^c	364	1,712	2,632	0	0	0
2017	3,103	2,025	0	0	0	0
2018 ^d	1,200	0	3,171	165	2,574	0

Yellow cells-recreational sector closed partially in a wave.

Red cells-recreational sector closed every day of the wave.

Gray cells-recreational landings reduced from 2010 oil spill and area closure.

^aJune-July seasonal closure implemented

^bACL reduced and an ACT implemented

^cSize limit increased from 30-34 in FL and ACL and ACT were further reduced

^dA seasonal closure of January 1 – June 30 was effective from January 27 – April 30, 2018 (GAJ #1 Framework). 2017 fishing was closed from March 24 – December 31. Landings for 2017 were from 1/1/7-3/23/17. A seasonal closure of Nov 1 – Apr 30 and Jun 1 – Jul 31 and fishing year of August to July was implemented in April 2018 with GAJ #2 Framework. Only landings from 1/1/18-1/26/18 and 5/1/18-5/31/18 were attributed to the 2017/2018 fishing year. August in Wave 4 for 2018 started the 2018/2019 fishing year.

Note: Landings for months when the recreational sector was closed are assumed to be zero even though yearly landings show greater amberjack harvest occurred.

Source: Recreational ACL file released July 25, 2019.

2.2 Action 2– Modify the Greater Amberjack Recreational Bag and Possession Limit

Alternative 1: No Action – Maintain the current one fish per angler per day recreational bag limit.

Alternative 2: Reduce the recreational bag limit to one fish per two or fewer anglers per day.

Alternative 3: Reduce the recreational bag limit to one fish per three or fewer anglers per day.

Alternative 4: Reduce the recreational bag limit to one fish per six or fewer anglers per day.

Alternative 5: Allow only one daily bag limit of greater amberjack per anglers on multi-day trips.

Note: Alternative 5 can be selected in addition to any of Alternatives 1-4.

Discussion

The recreational bag limit for Gulf of Mexico (Gulf) greater amberjack is one fish per angler per day and was implemented in 1997 (GMFMC 1995). Reduction of the bag limit below one fish per angler per day is being considered in an effort to decrease the likelihood of exceeding the annual catch target (ACT) and potentially allow for an increase in season length (Table 2.2.1).

Table 2.2.1. The number of Gulf greater amberjack that can be retained relative to the number of anglers for **Alternatives 1 – 4.**

Number of anglers	1 fish per angler (Alt. 1)	1 fish for 2 or fewer anglers (Alt. 2)	1 fish for 3 or fewer anglers (Alt. 3)	1 fish for 6 or fewer anglers (Alt. 4)
	Allowable number of fish	Allowable number of fish	Allowable number of fish	Allowable number of fish
1	1	1	1	1
2	2	1	1	1
3	3	2	1	1
4	4	2	2	1
5	5	3	2	1
6	6	3	2	1
7	7	4	3	2
8	8	4	3	2
9	9	5	3	2
10	10	5	4	2
11	11	6	4	2
12	12	6	4	2

Harvest rates are difficult to predict when management changes are frequent, specifically August through October, which have few landings data to inform forecasting analyses (Appendix A). **Alternatives 2-5** are expected to modestly reduce harvest (Table 2.2.2). The bag limit would need to be further reduced to achieve any substantial harvest reduction.

Table 2.2.2. Percent reductions in recreational landings under **Alternatives 2-5** relative to **Alternative 1**, and the number of fish allowed to be retained under each alternative.

Bag limit alternatives	Reduction	Allowance
Alternative 1: One fish per angler	0%	1 person on vessel retain 1 fish; 2 persons on vessel retain 2 fish, etc.
Alternative 2: One fish per 2 or fewer anglers	9.5%	1-2 anglers on vessel retain 1 fish; 3-4 anglers on vessel retain 2 fish, etc.
Alternative 3: One fish per 3 or fewer anglers	12.3%	1-3 anglers on vessel retain 1 fish; 4-6 anglers on vessel retain 2 fish, etc.
Alternative 4: One fish per 6 or fewer anglers	16.2%	1-6 anglers on vessel retain 1 fish; 7-12 anglers on vessel retain 2 fish, etc.
Alternative 5: Multi-day possession limits prohibited	2.7%	Same possession limit for a single or multi-day fishing trip

Source: See Appendix A.2 data sources

The Council has previously considered modifications of the one fish per angler per day bag limit in the past. During the development of Amendment 30A: Greater amberjack – revise rebuilding plan, accountability measures (GMFMC 2008), the Council received comments during public

hearings and from the Reef Fish Advisory Panel that called this type of bag limit the least acceptable way to manage the recreational sector (GMFMC 2008). The comments stated that bag limits less than 1 fish per angler per day would be arduous to enforce and would disproportionately affect the for-hire component of the recreational sector. During the development of Amendment 35 to the Reef Fish FMP, the Council also determined that there was little public interest in bag limits of less than 1 fish per angler per day and moved the action to considered by rejected (GMFMC 2012). Recent input from stakeholders at the June 2019 Council meeting indicated interest in reducing the recreational bag limit as a tool for extending the fishing season. However, results from recent analyses have indicated that even a reduction in the bag limit to 1 fish per 6 or fewer anglers would only reduce harvest by 16.2% (Table 2.2.1). This result is similar to what was found when drafting the Modifications to the Greater Amberjack Fishing Year and the Recreational Fixed Closed Season for the Reef Fish Resources of the Gulf of Mexico, including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis (GMFMC 2017b) where a further reduction to the bag limit was not expected to greatly reduce harvest. Ultimately, a reduction in bag limit was not pursued as a viable alternative for GMFMC 2017b. Due to the low number of multi-day recreational fishing trips, prohibiting a multi-day trip possession limit for greater amberjack would result in a harvest reduction of only 2.7% under **Alternative 5**.

2.3 Action 3– Modify the Greater Amberjack Recreational Fishing Year

Alternative 1: No Action – Do not modify the current August 1 – July 31 fishing year.

Alternative 2: Modify the fishing year to be January 1 – December 31.

Discussion

Alternative 1: No Action – Do not modify the current August 1 – July 31 fishing year.

Alternative 2: Modify the fishing year to be January 1 – December 31.

Discussion

The current fishing year (August 1 – July 31; **Alternative 1**) for recreational greater amberjack was established in the Framework to Modify the Greater Amberjack Fishing Year and the Recreational Fixed Closed Season (GMFMC 2017b). The fishing year for most reef fish species is based on the calendar year, January 1 – December 31 (**Alternative 2**) and was established in the original Reef Fish FMP (GMFMC 1981). Even though neither **Alternative 1** nor **2** modify the length of the fishing year (both represent a 12-month period), harvest rates do vary by month (Figure 2.3.1). This combined with the recreational 2-month wave reporting time periods can confound forecast analyses. For example, opening the fishing year in month that splits a wave may limit the season duration relative to beginning the fishing year in a month without a split wave due to less assumptions needing to be made.

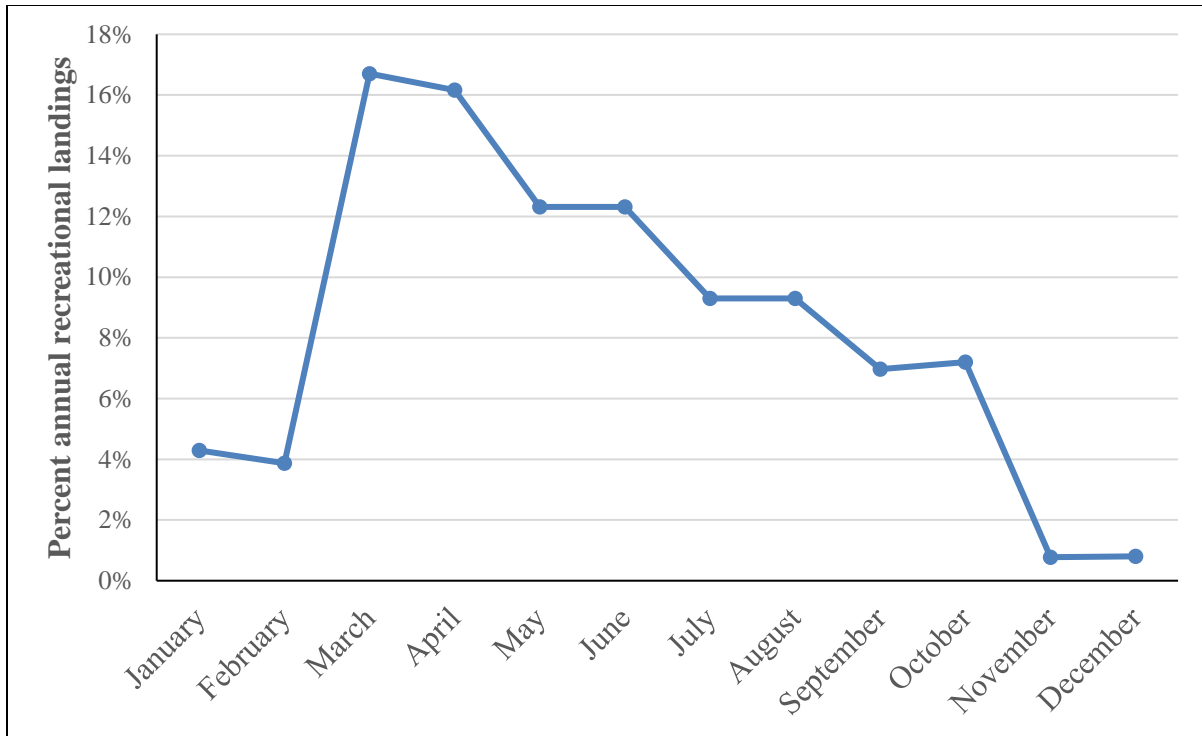


Figure 2.3.1. Percent annual landings of recreationally harvested Gulf greater amberjack by month from 2011-2018.

All of the predicted landings before 2013 were modified to account for the change in landings from the increase in size limit from 30 to 34 inches fork length in January 2016. A more detailed explanation of data sources for calculation of daily recreational catch rates by month are available in Appendix A.

Under **Alternative 1**, the recreational fishing year for greater amberjack begins each year on August 1 and extends through July 31. This creates a fishing year for the recreational harvest of greater amberjack that differs from all other federally managed reef fish except for commercial and recreational yellowtail snapper, which was changed to an August 1 through July 31 fishing year in 2017 (GMFMC 2016). Under current management, many reef fish species open to harvest each year on January 1, but some species close before the end of the calendar year if the ACL or ACT is met or projected to be met. The result is that fewer species may be open to harvest later in the calendar year. **Alternative 1** provides access to a highly prized species later in the calendar year during a period of the year when the harvest of other prized species (e.g., red snapper) is typically prohibited in federal waters. However, under **Alternative 1**, there is a disparity in the fishing year for greater amberjack between the commercial and recreational sectors and a split of the 2-month recreational reporting period occurs. This complicates efforts to monitor annual harvest and to determine if the combined commercial and recreational landings have exceeded the acceptable biological catch. Furthermore, **Alternative 1** did not allow for a spring season in the 2018/2019 fishing year as the ACT was exceeded by the end of the fall fishing season. **Alternative 2** would re-establish a January 1 – December 31 fishing year for both sectors and allows for estimates of total harvest (i.e., both recreational and commercial

sectors) that are within the same time period, which is useful for stock assessments and monitoring the progress of the rebuilding plan. Furthermore, **Alternative 2** would no longer split a recreational reporting wave. Lastly, **Alternative 2** would allow harvest to begin during the shorter spring season (May) which would increase the likelihood of being able to harvest during both the spring and fall.

Alternative 1 affects the recreational landings monitoring process for three of the Gulf States (Florida, Alabama, and Mississippi). Recreational landings of greater amberjack from private anglers and state permitted for-hire vessels are estimated via the MRIP in six two-month waves for these three states, while Louisiana and Texas recreational landings are monitored through state programs. The two months included in wave 4 (July and August) are the last month of one fishing year (July) and the first month of the next fishing year (August). Thus, **Alternative 1** requires wave 4 (July – August landings) to be split into separate fishing years. This increases the uncertainty of the landings estimate and causes delays in producing estimates of annual harvest. **Alternative 2** would move the start of the fishing year back to January 1, and, therefore, would not require an adjustment for splitting wave 4 in the MRIP data. However, implementation of **Alternative 2** would take special consideration as to when implementation would occur and how the current fishing year harvest would be distributed across the calendar year ACL and ACT.

Under **Alternative 1**, the 2019/2020 recreational fishing year would begin on August 1, 2019, and extend through July 31, 2020. Each subsequent recreational fishing year would also begin on August 1 and extend through July 31 of the following calendar year. Under **Alternative 2**, the recreational fishing year would return to the calendar year of January 1 – December 31. Both alternatives would use the 2020 and beyond recreational ACL and ACT established in a recent greater amberjack framework action (GMFMC 2017a) at the beginning of the next fishing year.

2.4 Action 4– Modify the Greater Amberjack Recreational Fixed Closed Season

Alternative 1: No Action – Do not modify the current November 1 – April 30 and June 1 – July 31 seasonal closure (open May 1 – May 31 and August 1 – October 31).

Alternative 2: Modify the recreational seasonal closure to be November 1 – April 30 and June 1 – August 31 (Open May 1 – May 31 and September 1 – October 31).

Alternative 3: Modify the recreational seasonal closure to be November 1 – April 30 and May 21 – July 31 (Open May 1 – May 20 and August 1- October 31).

Alternative 4: Modify the recreational seasonal closure to be November 1 – April 30 and May 21 – August 31 (Open May 1 – May 20 and September 1- October 31).

Alternative 5: Modify the recreational seasonal closure to be October 1 – April 30 and May 21 – June 30 (Open May 1 – May 20 and July 1- September 30).

Discussion

The peak spawning period for greater amberjack is March through April in most of the Gulf (Wells and Rooker 2002; Murie and Parkyn 2008; SEDAR 33 2014) and April through May in the Florida Keys (Harris et al. 2007). **Alternatives 1 - 5** would retain a closed season during part of the peak spawning period (March through April). **Alternatives 1 - 5** would still allow for harvest of greater amberjack after the red snapper season has closed or right before it typically opens. Modifications to the current closed seasons (**Alternative 1**) would include adding the month of August to the summer closed season (**Alternative 2**), limiting harvest in the month of May to 20 days (**Alternative 3**), or both adding the month of August to the summer closed season and limiting harvest in the month of May to 20 days (**Alternative 4**). **Alternative 5** would add the month of July to the open season and limit harvest in the month of May to 20 days (Table 2.4.1).

Table 2.4.1. Optional recreational seasons for Gulf greater amberjack (Action 4) for each fishing year alternative (Action 3). Black indicates months where no harvest would be permitted (closed season) and white indicates months where harvest is permitted (open season). The gray color during the month of May for **Alternatives 3, 4 and 5** indicate a partial open season within the month where harvest would be allowed from May 1 – May 20.

Fishing year August 1 – July 31 (Action 3 Alternative 1)												
Action 4	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Alternative 1												
Alternative 2												
Alternative 3												
Alternative 4												
Alternative 5												
Fishing year January 1 – December 31 (Action 3 Alternative 2)												
Action 4	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alternative 1												
Alternative 2												
Alternative 3												
Alternative 4												
Alternative 5												

Greater amberjack accountability measures (AM) include requiring the Regional Administrator (RA) to close the respective sector to further harvest of greater amberjack when the sector’s ACT has been met or projected to be met, and to reduce that sector’s ACL and ACT in the following year by the amount of any overage of the sector ACL. In years when an ACL overage occurs, the amount of the overage must be subtracted from the recreational ACL and ACT in the following fishing year.

Alternative 1 would maintain the current recreational fishing season that was effective in April 2018, which allows for recreational harvest of greater amberjack in the fall and May when the harvest of other species, such as red snapper, is prohibited. This fishing season also provides protection to the stock during its rebuilding period (GMFMC 2017b). However, during the 2018/2019 fishing year, no harvest was permitted for the month of May (2019) due to the ACT having been harvested during the fall open period in 2018. Due to the timing of the rule, nearly all of the ACL for 2017/2018 was available in May and subsequently a closure did not occur. The recreational sector has now experienced an in-season closure on the harvest of greater amberjack in all full fishing years since 2014 (Table 2.4.2).

Table 2.4.2 Recreational greater amberjack closures from 2013-2019.

Fishing Year	Closure Date
2018/2019	May 1
2017/2018	None
2017	March 24
2016	June 1
2015	September 28
2014	August 24
2013	None

Combined Analysis of Actions 2, 3, and 4

The estimated season duration depends on the bag limit selected in Action 2 and the fishing year selected in Action 3. Alternatives for bag limit modification would have different effects on the percent by which the recreational harvest would be reduced. Variability in the daily catch rate between months would influence the overall cumulative harvest rate differently depending on when the beginning of the fishing year is defined. To account for these uncertainties, forecasting analyses for all combinations of alternatives from Actions 2 -4 were performed to predict the season duration for the recreational harvest of Gulf greater amberjack (Tables 2.4.3 – 2.4.6). In all analyses, season duration is defined as the amount of time (in days) estimated to land the recreational ACT of 1,086,985 lbs whole weight (lbs ww) under each action and alternative combination.

Table 2.4.3. Estimated recreational season durations with a bag limit of *1 fish per angler per day* (Action 2 Alternative 1) for both fishing year alternatives (Action 3), and all five season alternatives (Action 4).

Fishing Year	Estimated Closure Date	Number of days open
August 1 to July 31 Fishing Year (Action 3 Alternative 1)		
Open period August 1 – October 31 and May 1 – May 31 (Alt. 1)	10-May	102
Open period September 1 – October 31 and May 1 – May 31 (Alt. 2)	None	92
Open period August 1 – October 31 and May 1 – May 20 (Alt. 3)	10-May	102
Open period September 1 – October 31 and May 1 – May 20 (Alt. 4)	None	92
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	10-Jul	92
January 1 to December 31 Fishing Year (Action 3 Alternative 2)		
Open period May 1 – May 31 and August 1 – October 31 (Alt. 1)	24-Sep	86
Open period May 1 – May 31 and September 1 – October 31 (Alt. 2)	None	92
Open period May 1 – May 20 and August 1 – October 31 (Alt. 3)	24-Sep	105
Open period May 1 – May 20 and September 1 – October 31 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	3-Sep	86

Source: See Appendix A.2 Data sources

Table 2.4.4. Estimated recreational season durations with a bag limit of *1 fish per 2 or fewer anglers per day* (Action 2 Alternative 2) for both fishing year alternatives (Action 3), and all 5 season alternatives (Action 4).

Fishing Year	Estimated Closure Date	Number of days open
August 1 to July 31 Fishing Year (Action 3 Alternative 1)		
Open period August 1 – October 31 and May 1 – May 31 (Alt. 1)	17-May	109
Open period September 1 – October 31 and May 1 – May 31 (Alt. 2)	None	92
Open period August 1 – October 31 and May 1 – May 20 (Alt. 3)	17-May	109
Open period September 1 – October 31 and May 1 – May 20 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	20-Jul	102
January 1 to December 31 Fishing Year (Action 3 Alternative 2)		
Open period May 1 – May 31 and August 1 – October 31 (Alt. 1)	7-Oct	99
Open period May 1 – May 31 and September 1 – October 31 (Alt. 2)	None	92
Open period May 1 – May 20 and August 1 – October 31 (Alt. 3)	26-Oct	107
Open period May 1 – May 20 and September 1 – October 31 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	15-Sep	98

Source: See Appendix A.2 Data sources

Table 2.4.5. Estimated recreational season durations with a bag limit of *1 fish per 3 or fewer anglers per day* (Action 2 Alternative 3) for both fishing year alternatives (Action 3), and all 5 season alternatives (Action 4).

Fishing Year	Estimated Closure Date	Number of days open
August 1 to July 31 Fishing Year (Action 3 Alternative 1)		
Open period August 1 – October 31 and May 1 – May 31 (Alt. 1)	19-May	111
Open period September 1 – October 31 and May 1 – May 31 (Alt. 2)	None	92
Open period August 1 – October 31 and May 1 – May 20 (Alt. 3)	19-May	111
Open period September 1 – October 31 and May 1 – May 20 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	23-Jul	105
January 1 to December 31 Fishing Year (Action 3 Alternative 2)		
Open period May 1 – May 31 and August 1 – October 31 (Alt. 1)	11-Oct	103
Open period May 1 – May 31 and September 1 – October 31 (Alt. 2)	None	92
Open period May 1 – May 20 and August 1 – October 31 (Alt. 3)	30-Oct	111
Open period May 1 – May 20 and September 1 – October 31 (Alt. 4)	None	112
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	20-Sep	103

Source: See Appendix A.2 Data sources

Table 2.4.6. Estimated recreational season durations with a bag limit of *1 fish per 6 or fewer anglers per day* (Action 2 Alternative 4) for both fishing year alternatives (Action 3), and all 5 season alternatives (Action 4).

Fishing Year	Estimated Closure Date	Number of days open
August 1 to July 31 Fishing Year (Action 3 Alternative 1)		
Open period August 1 – October 31 and May 1 – May 31 (Alt. 1)	23-May	115
Open period September 1 – October 31 and May 1 – May 31 (Alt. 2)	None	92
Open period August 1 – October 31 and May 1 – May 20 (Alt. 3)	None	112
Open period September 1 – October 31 and May 1 – May 20 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	28-Jul	110
January 1 to December 31 Fishing Year (Action 3 Alternative 2)		
Open period May 1 – May 31 and August 1 – October 31 (Alt. 1)	17-Oct	109
Open period May 1 – May 31 and September 1 – October 31 (Alt. 2)	None	92
Open period May 1 – May 20 and August 1 – October 31 (Alt. 3)	None	112
Open period May 1 – May 20 and September 1 – October 31 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	26-Sep	109

Source: See Appendix A.2 Data sources

Modifications to the bag limit (Action 2, Alternatives 1-4) do not have a sizable effect on estimated season duration. For example, the maximum season duration estimated under any proposed bag limit varies by no more than 10 days. Overall, only the combinations that extend the summer closed season to include the month of August (Action 4 Alternative 2), or that extend the summer closed season to include August and partially close the month of May (Action 4 Alternatives 4) result in no in-season closure for either fishing year (Action 3 Alternatives 1 and 2). The only combinations of alternatives that are estimated to achieve a fishing season that includes August in the fall open season (Action 4 Alternative 3) is when harvest is restricted to 1 fish per 6 or fewer anglers per day (Action 2 Alternative 4) for either fishing year (Action 3 Alternatives 1-2).

There is uncertainty in the estimates produced by the decision tool because it assumes future catch rates will stay the same; however, in practice catch rates may increase or decrease for various reasons. Additionally, May begins a new data collection wave in the Marine Recreational Information Plan (MRIP) and it will be difficult to quickly process data landings data in during that month with a partial open season (**Alternatives 3, 4, and 5**). However, this information is important so a baseline for all years could be explored.

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APPENDIX A. ALTERNATIVE ANALYSES: MODELING RECREATIONAL MANAGEMENT CHANGES FOR GULF OF MEXICO GREATER AMBERJACK

A.1 Introduction

Greater amberjack (*Seriola dumerili*) are one of 31 reef fish species managed by the Gulf of Mexico Fishery Management Council (Council). Greater amberjack are in the Council's Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf of Mexico. The FMP provides management for reef fish species in the federal waters of the Gulf of Mexico.

In 2016, a stock assessment was conducted for the Gulf of Mexico (Gulf) greater amberjack (SEDAR 33 Update). Results from the assessment showed the greater amberjack stock is overfished and experiencing overfishing. A Framework Action is currently being drafted and its purpose is to examine recreational zoning and possible modifications to the recreational bag limit, recreational fishing year and season. The current management measures for the recreational sector are an August 1 to July 31 fishing year, closed seasons from November 1 – April 30 and June 1 to July 31, minimum size of 34 inches fork length (FL), and one greater amberjack per angler per day bag limit. These management measures and the ACL are for the entire Gulf.

A.2 Data Sources

Recreational landings data for Gulf of Mexico greater amberjack were obtained from the Southeast Fisheries Science Center (SEFSC) Marine Recreational Information Program (MRIP), the Texas Parks and Wildlife Department (TPWD) Creel Survey, Louisiana Creel survey (LA Creel) and the Headboat Survey (Headboat). MRIP, TPWD, and LA Creel conducted dockside intercepts to collect information on the size and number of greater amberjack. Headboat collected size and number of greater amberjack through logbooks completed by headboat operators. Recreational landings come from the ACL dataset provided from the Southeast Fisheries Science Center on July 25, 2019.

A.3 Methods

The Council is considering recreational zoning and changes to the recreational bag limit, recreational fishing year and season, for Gulf greater amberjack in a Framework Action. The Council's management measures proposed in the current Framework Action were explored.

A.3.1 Predicted Landings

The Framework Action currently being drafted will be imposed on future fishing years. An estimate of future landings are required to explore the impact of modifying the season start date and different closed seasons.

The greater amberjack recreational fishery has had several regulations changes over the past five years. For example there have been changes to the start of the fishing year, bag limit, size limit, and changes to the periods of time when the recreational sector was open for harvest. Since the recreational sector has had numerous regulation changes it was assumed that landings in recent years are the best predictor of future landings. One specific and significant change to the recreational sector occurred on January 4, 2016 when the size limit was increased from 30 to 34 inches fork length. This size limit change can impact the catch rates since it forces the fishers to release fish less than 34 inches and potentially target fish 34 inches or greater. This change to the catch was examined by looking at the size of greater amberjack harvested in the recreational sector before the size limit change (2013-2015) and after the size limit change (2016-2018). Before the size limit change the average length was 36.4 inches FL (standard deviation = 6.37) and it increased to an average length of 38.7 inches fork length (standard deviation = 5.12). The different average lengths were compared with a two sample t-test, and there is a significant difference between them ($n = 2,354$; t Value = 8.09, $P < 0.001$). There was a change to the length distribution of greater amberjack after the size limit was increased (Figure A.3.1). Therefore, landings data from 2016 or earlier was used to predict future landings.

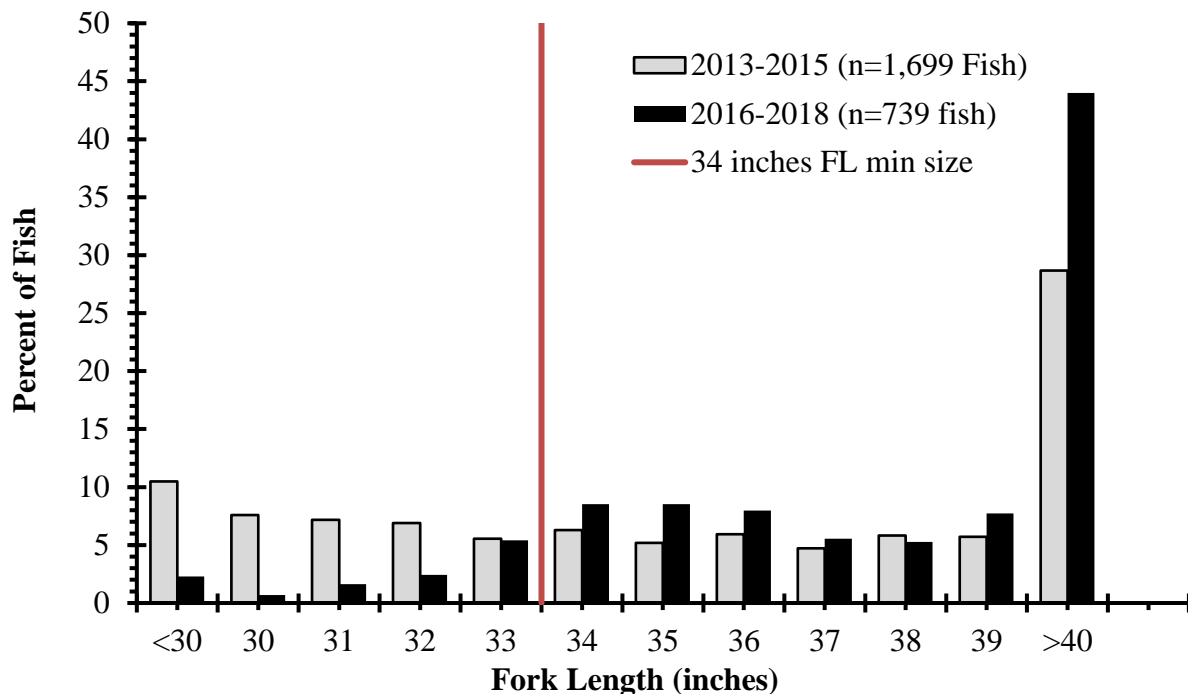


Figure A.3.1. Length distribution of Gulf of Mexico recreational greater amberjack before (2013-2015) and after (2016-2018). These time periods were used because the size limit changed from 30 to 34 inches fork length on January 4, 2016. Length data came from MRIP, TPWD, LA Creel, and Headboat datasets.

The recreational landings from 2016 to 2018 were examined to determine when the fishery was open. Predicted landings for January and February were determined from the average landings from 2016 and 2017 since the recreational sector was open for this time period in these two years. The only time the recreational sector was open in March and April since the size limit change was in 2016, therefore, the landings in March and April of 2016 were used to predict

future March and April landings. The recreational sector was open in May in 2016 and 2018 and the average from May in these two years was used to predict future May landings. The recreational sector has been closed in June for the past three years so it was assumed the landings in June are the same as the predicted landings in May. A similar situation occurred in July and August where the recreational sector was closed from 2016-2018 in July and only open in August of 2018. Landings from August of 2018 were used to predict future August landings and it was assumed the landings in July have the same catch rate as August. The only time the recreational sector was open in September and October since the size limit change was in 2018, therefore, the landings in September and October of 2018 were used to predict future September and October landings. The last time the greater amberjack recreational sector was open in November and December was in 2011, 2012, and 2013. The landings from 2011, 2012, and 2013 were first reduced to adjust for the decrease in landings from the change in the size limit and the percent reductions came from the 2015 Framework Action. Then average landings from 2011-2013 were used to predict future November and December landings. Details of the landings used to create future predicted landings are shown in Table A.3.1. The predicted future landings are plotted in Figure A.3.2.

Table A.3.1. Details of the landings used to determine the predicted recreational landings for greater amberjack.

	Jan/Feb	Mar/Apr	May/June	Jul/Aug	Sep/Oct	Nov/Dec
Details	Average of 2016 and 2017 landings	2016 Landings	Average of 2016 and 2018 Landings in May. June landings assumed to be the same as May	2018 Landings in August. July landings assumed to be same as August	2018 Landings	2011-2013 landings were modified due to the size limit increase. Average landings by wave from 2011-2013.

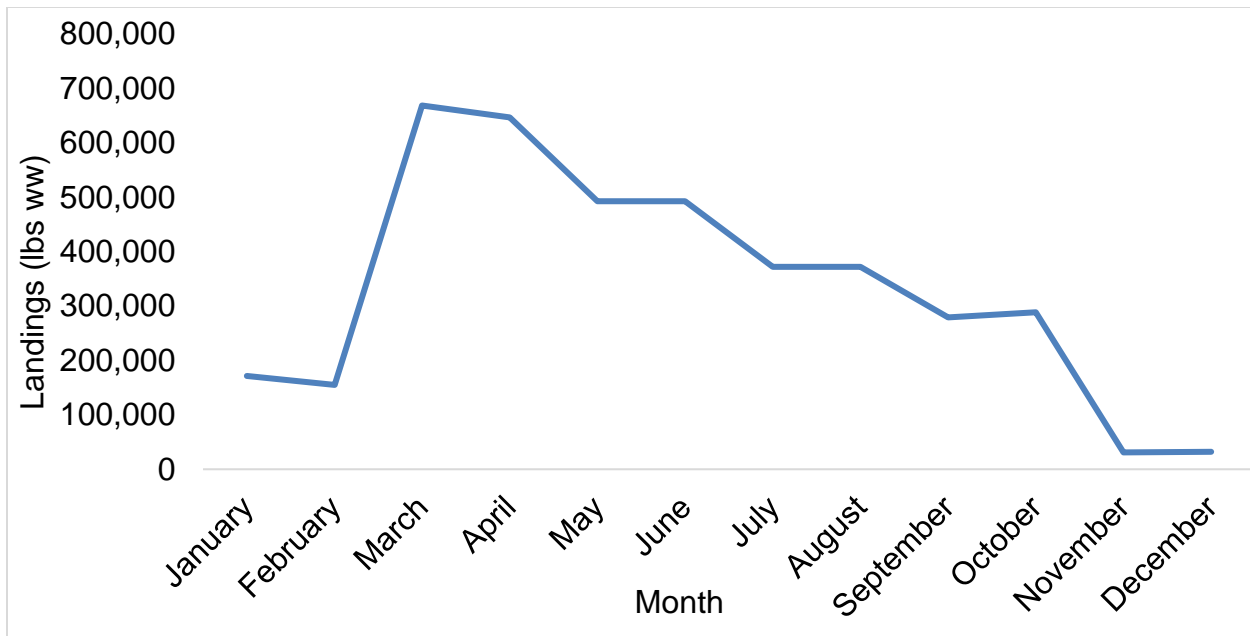


Figure A3.2. Predicted future Gulf of Mexico greater amberjack recreational landings by month.

A.3.2 Season Analyses

Recreational landings of greater amberjack are highly seasonal in the Gulf of Mexico; thus, reductions associated with seasonal closures differ greatly depending upon the time period selected for closure (Figure A.3.2). Following the Actions and Alternative presented in the Council’s Framework Action the predicted landings were projected until the Annual Catch Target (ACT) of 1,086,985 pounds whole weight (lbs ww) was met. A range of fishing years and closed seasons were examined and the landings were compared.

The Council is also considering modifying the bag limit to reduce landings. The current bag limit is one fish per person per day and the Council is considering reducing the bag limit even further. The Council is considering one fish for every two people or one fish for every three people with an allowance for fewer people. Table A.3.2 illustrates the allowance of fish per person being proposed by the Council. The statistics on number of anglers and the number of greater amberjack harvested per trip from 2016, 2017, and 2018 were analyzed. Percent reduction in landings from the fractional bag limits were calculated by determining what percentage of the landings will be reduced from reducing the bag limit (Table A.3.3). The Council is also considering reducing the recreational possession limit on a multi-day trip to 1 fish per angler. This was analyzed by capping all of the multi-day trips (>24 hours) so there were no multi-day trips that exceeded one greater amberjack per person and analyzing how this reduced the landings. This resulted in a 2.7% reduction in landings (Table A.3.3).

Table A.3.2. Allowance of Gulf of Mexico greater amberjack for the proposed changes to the recreational bag limit.

Number of Anglers	1 fish per angler	1 fish for 2 or fewer anglers	1 fish for 3 or fewer anglers	1 fish for 6 or fewer anglers
	Allowable number of fish	Allowable number of fish	Allowable number of fish	Allowable number of fish
1	1	1	1	1
2	2	1	1	1
3	3	2	1	1
4	4	2	2	1
5	5	3	2	1
6	6	3	2	1
7	7	4	3	2
8	8	4	3	2
9	9	5	3	2
10	10	5	4	2
11	11	6	4	2
12	12	6	4	2

Table A.3.3. Projected percent reductions of greater amberjack landings from imposing bag limits on the Gulf of Mexico recreational sector. The current bag limit is 1 fish per angler per day.

Bag limit alternatives	Reduction	Allowance
One fish per angler	0%	N/A
One fish per 2 or fewer anglers	9.5%	1-2 anglers on vessel retain 1 fish; 3-4 anglers on vessel retain 2 fish, etc.
One fish per 3 or fewer anglers	12.3%	1-3 anglers on vessel retain 1 fish; 4-6 anglers on vessel retain 2 fish, etc.
One fish per 6 or fewer anglers	16.2%	1-6 anglers on vessel retain 1 fish; 7-12 anglers on vessel retain 2 fish, etc.
One fish per angler on multi-day trips	2.7%	No possession limit change for a multi-day trip

The calculated reduction in landings from reducing the bag limit to one fish for up to two people or one fish for up to three people were applied to the predicted future landings. The modified predicted future landings were analyzed to determine when the ACT would be met.

A.4 Results

Estimated closure dates and days open in the season were provided for a variety of fishing years and closed seasons. The estimated closure dates and days were determined from cumulatively summing the landings until the ACT was met. The data used in Table A.4.1 assumes the bag limit was not changed (bag limit equals one fish per person). The data used in Table A.4.2 assumes the bag limit was decreased to one fish for two people, the data used in Table A.4.3 assumes the bag limit was reduced to one fish for three people, and the data used in Table A.4.4 assumes the bag limit was reduced to one fish for six people.

Table A.4.1. Estimated recreational season durations with a bag limit of 1 fish per angler per day (Action 2 Alternative 1) for both fishing year alternatives (Action 3), and all 5 season alternatives (Action 4).

Fishing Year	Estimated Closure Date	Number of days open
August 1 to July 31 Fishing Year (Action 3 Alternative 1)		
Open period August 1 – October 31 and May 1 – May 31 (Alt. 1)	10-May	102
Open period September 1 – October 31 and May 1 – May 31 (Alt. 2)	None	92
Open period August 1 – October 31 and May 1 – May 20 (Alt. 3)	10-May	102
Open period September 1 – October 31 and May 1 – May 20 (Alt. 4)	None	92
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	10-Jul	92
January 1 to December 31 Fishing Year (Action 3 Alternative 2)		
Open period May 1 – May 31 and August 1 – October 31 (Alt. 1)	24-Sep	86
Open period May 1 – May 31 and September 1 – October 31 (Alt. 2)	None	92
Open period May 1 – May 20 and August 1 – October 31 (Alt. 3)	24-Sep	105
Open period May 1 – May 20 and September 1 – October 31 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	3-Sep	86

Table A.4.2. Estimated recreational season durations with a bag limit of 1 fish per 2 or fewer anglers per day (Action 2 Alternative 2) for both fishing year alternatives (Action 3), and all 5 season alternatives (Action 4).

Fishing Year	Estimated Closure Date	Number of days open
August 1 to July 31 Fishing Year (Action 3 Alternative 1)		
Open period August 1 – October 31 and May 1 – May 31 (Alt. 1)	17-May	109
Open period September 1 – October 31 and May 1 – May 31 (Alt. 2)	None	92
Open period August 1 – October 31 and May 1 – May 20 (Alt. 3)	17-May	109
Open period September 1 – October 31 and May 1 – May 20 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	20-Jul	102
January 1 to December 31 Fishing Year (Action 3 Alternative 2)		
Open period May 1 – May 31 and August 1 – October 31 (Alt. 1)	7-Oct	99
Open period May 1 – May 31 and September 1 – October 31 (Alt. 2)	None	92
Open period May 1 – May 20 and August 1 – October 31 (Alt. 3)	26-Oct	107
Open period May 1 – May 20 and September 1 – October 31 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	15-Sep	98

Table A.4.3. Estimated recreational season durations with a bag limit of 1 fish per 3 or fewer anglers per day (Action 2 Alternative 3) for both fishing year alternatives (Action 3), and all 5 season alternatives (Action 4).

Fishing Year	Estimated Closure Date	Number of days open
August 1 to July 31 Fishing Year (Action 3 Alternative 1)		
Open period August 1 – October 31 and May 1 – May 31 (Alt. 1)	19-May	111
Open period September 1 – October 31 and May 1 – May 31 (Alt. 2)	None	92
Open period August 1 – October 31 and May 1 – May 20 (Alt. 3)	19-May	111
Open period September 1 – October 31 and May 1 – May 20 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	23-Jul	105
January 1 to December 31 Fishing Year (Action 3 Alternative 2)		
Open period May 1 – May 31 and August 1 – October 31 (Alt. 1)	11-Oct	103
Open period May 1 – May 31 and September 1 – October 31 (Alt. 2)	None	92
Open period May 1 – May 20 and August 1 – October 31 (Alt. 3)	30-Oct	111
Open period May 1 – May 20 and September 1 – October 31 (Alt. 4)	None	112
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	20-Sep	103

Table A.4.4. Estimated recreational season durations with a bag limit of 1 fish per 6 or fewer anglers per day (Action 2 Alternative 4) for both fishing year alternatives (Action 3), and all 5 season alternatives (Action 4).

Fishing Year	Estimated Closure Date	Number of days open
August 1 to July 31 Fishing Year (Action 3 Alternative 1)		
Open period August 1 – October 31 and May 1 – May 31 (Alt. 1)	23-May	115
Open period September 1 – October 31 and May 1 – May 31 (Alt. 2)	None	92
Open period August 1 – October 31 and May 1 – May 20 (Alt. 3)	None	112
Open period September 1 – October 31 and May 1 – May 20 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	28-Jul	110
January 1 to December 31 Fishing Year (Action 3 Alternative 2)		
Open period May 1 – May 31 and August 1 – October 31 (Alt. 1)	17-Oct	109
Open period May 1 – May 31 and September 1 – October 31 (Alt. 2)	None	92
Open period May 1 – May 20 and August 1 – October 31 (Alt. 3)	None	112
Open period May 1 – May 20 and September 1 – October 31 (Alt. 4)	None	81
Open May 1 – May 20 and July 1 – September 30 (Alt. 5)	26-Sep	109

A.5 References

SEDAR 33 Update. 2016. Stock assessment update report Gulf of Mexico greater amberjack (*Seriola dumereli*). Southeast Data, Assessment and Review. North Charleston, South Carolina. <http://www.sefsc.noaa.gov/sedar/>