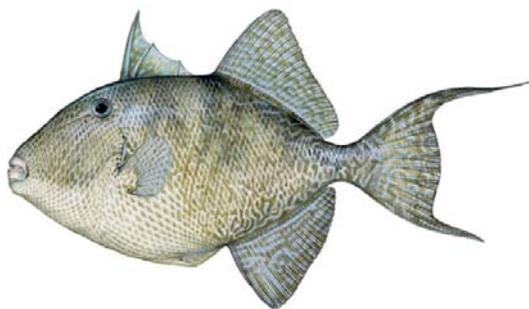


Modifications to the Gray Triggerfish Rebuilding Plan



Draft Options Paper

For Amendment 46

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COVER SHEET

Name of Action

Options Paper for Amendment 46: Modifications to the Gray Triggerfish Rebuilding Plan

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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
AMs	accountability measures
B	biomass
B _{MSY}	stock biomass level capable of producing an equilibrium yield of MSY
Council	Gulf of Mexico Fishery Management Council
F	Instantaneous rate of fishing mortality
FL	fork length
F _{MSY}	fishing mortality rate corresponding to an equilibrium yield of MSY
F _{OY}	fishing mortality rate corresponding to an equilibrium yield of OY
F _{30% SPR}	fishing mortality corresponding to 30% spawning potential ratio
FMP	Fishery Management Plan
GMFMC	Gulf of Mexico Fishery Management Council
M	Instantaneous rate of natural mortality
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	Maximum fishing mortality threshold
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing level
OY	optimum yield
SEDAR	Southeast Data, Assessment and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SSASPM	State-Space Age-Structured Production Model
SSB	spawning stock biomass
SSC	Scientific and Statistical Committee
SPR	Spawning potential ratio
ww	whole weight

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CHAPTER 1. INTRODUCTION

1.1 Background and Status of the Gray Triggerfish Stock

Gray triggerfish (*Balistes capriscus*) is one of 31 reef fish species in the management unit for the Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf of Mexico (Gulf). The FMP provides management for reef fish species in the federal waters of the Gulf.

Gray triggerfish is caught throughout the Gulf, but landings are greater east of the Mississippi River than in the western Gulf (SEDAR 43 2015). Total landings in the last fifteen years, from 2001 through 2015, have increased and peaked in 2004 at almost 1,200,000 lbs whole weight (ww) (Figure 1.1.1). Landings declined after 2004 to just under 500,000 lbs ww in 2008 and 2009 and decreased to around 350,000 lbs ww in 2010. In 2013, landings increased to 564,000 lbs ww.

In 2012, the Gulf of Mexico Fishery Management Council (Council) modified the gray triggerfish rebuilding plan through Reef Fish Amendment 37 (GMFMC 2012). This rebuilding plan implemented management changes to the recreational and commercial sectors. Amendment 37 reduced the recreational annual catch limit (ACL) to 241,200 lbs ww and the recreational annual catch target (ACT) to 217,100 lbs ww. The commercial ACL was reduced to 64,100 lbs ww and the commercial ACT (quota) was reduced to 60,900 lbs ww. This rebuilding plan also established a fixed closed season for both the recreational and commercial sectors during peak spawning during the months of June 1 – July 31. A recreational bag limit of 2 gray triggerfish within the 20-reef fish aggregate bag limit and a commercial trip limit of 12 gray triggerfish was also established. The recreational accountability measures were modified to allow an in-season closure authority for gray triggerfish based on the recreational ACT. As long as gray triggerfish remains overfished, if the recreational ACL is exceeded a post-season overage adjustment is applied at or near the beginning of the following fishing year.

Annual Catch Limit (ACL)

The amount of fish that can be harvested from the stock each year.

Annual Catch Target (ACT)

A harvest level set lower than the annual catch limit to create a buffer so that overharvest does not occur.

Accountability Measures (AMs)

Measures taken to prevent harvest from exceeding the annual catch limit and, if exceeded, to mitigate or correct the overage.

The recent SEDAR 43 (2015) standard assessment of gray triggerfish was completed and reviewed by the Scientific and Statistical Committee (SSC) in October 2015. The assessment indicated that the Gulf of Mexico gray triggerfish was no longer undergoing overfishing, but remains overfished (Table 1.1.1). On November 2, 2015, NMFS notified the Council that the Gulf gray triggerfish stock was not making adequate progress toward rebuilding. Within two years of this notification, the Council must prepare and implement a plan amendment or proposed regulations to rebuild the stock. Based on SSC recommendations and Council

discussion, the Council requested additional data and analyses from the Southeast Fisheries Science Center (SEFSC) for subsequent review by the SSC. The Council requested the SEFSC complete six projection scenarios with specific rebuilding targets of 8, 9, and 10 years and assuming two recruitment scenarios due to recruitment concerns brought up during the assessment for the SSC to review at their January 2016 meeting.

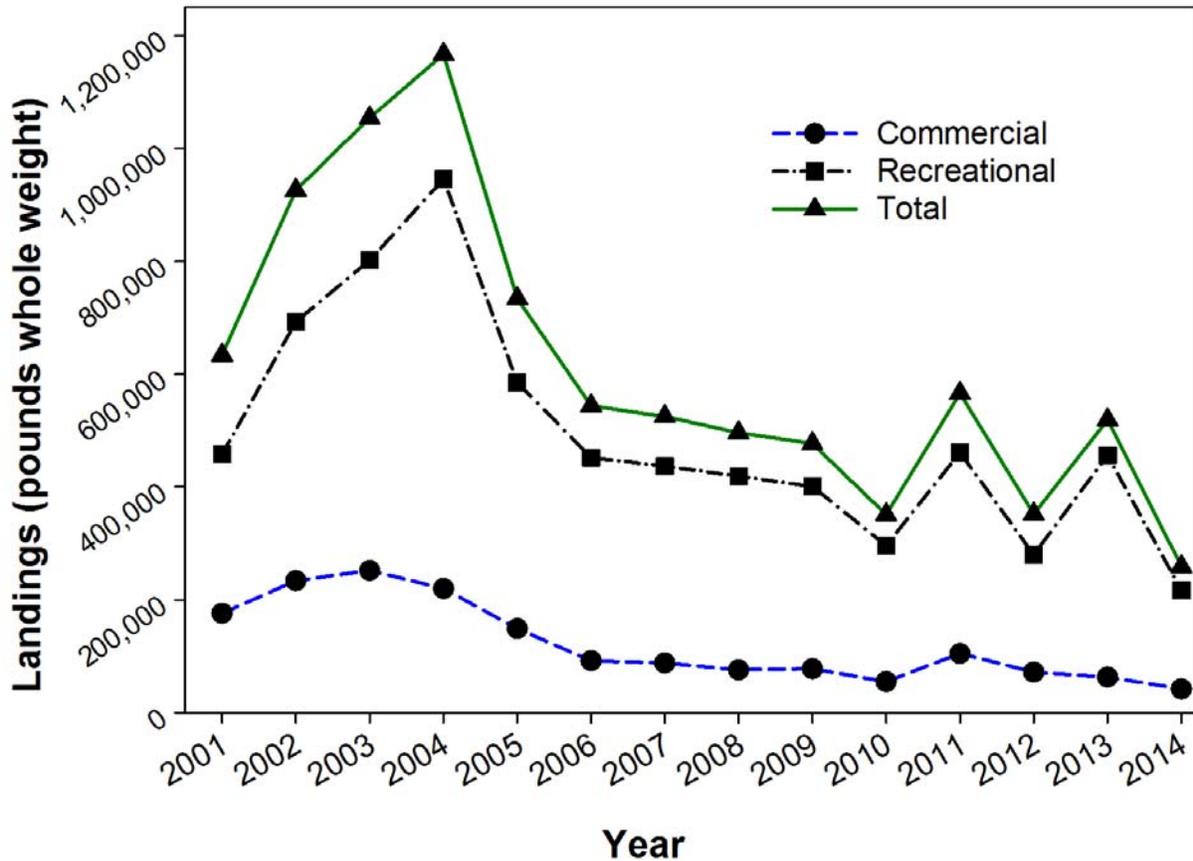


Figure 1.1.1. Gulf of Mexico gray triggerfish recreational, commercial, and total landings in pounds whole weight from 2001 through 2014. Source: Commercial landings from SERO (February 16, 2016). Recreational landings are from the ACL dataset (October 8, 2014).

In January 2016, the SSC accepted the low recruitment for 2014-2018 scenarios as the basis for the projections because the results of the analyses demonstrated there was a 5-year auto-correlation in the recruitment indices. However, the SSC felt there was no information in the assessment to support holding recruitment at lower levels more than 5 years into the future. The Council requested the projections start in 2017; however, the last year of data in the assessment was 2013 therefore, the following methodology was used for 2014, 2015, and 2016 landings. For 2014, the SEFSC used the finalized commercial and recreational landings; however at the time 2015 landings were only provisional for the commercial sector and partially available for the recreational sector, with the remainder of the 2015 recreational landings estimated based on

prior years' landings. For 2016, the total landings were set at the combined commercial and recreational ACLs of 305,300 lbs ww. Selectivity, discard, and retention functions were held constant for all years of the projections. The assessment indicated that the Gulf gray triggerfish stock was no longer undergoing overfishing, but remains overfished (Table 1.1.1).

Table 1.1.1. Status determination criteria and stock status of gray triggerfish based on SEDAR 43 (2015) accepted by the SSC. The highlighted rows indicate gray triggerfish stock status as overfished ($SSB_{CURRENT}/MSST$) but no longer experiencing overfishing ($F_{CURRENT}/MFMT$).

Criteria	Definition	Value
<i>Mortality Rate Criteria</i>		
F _{MSY}	F _{30% SPR}	0.166
MFMT	F _{MSY proxy}	0.166
F _{FOY proxy}	75% of F _{30% SPR}	0.125
F _{CURRENT}	2013	0.120
F_{CURRENT}/MFMT	30% SPR proxy	0.72
Base M	M	0.28
<i>Biomass Criteria</i>		
SSB _{MSY proxy} (egg production)	Equilibrium egg production @ F _{30% SPR}	9.16E+09
MSST (egg production)	(1-M)*SSB _{30% SPR} : M= 0.28	6.60E+09
SSB _{CURRENT}	2013	1.13E+10
SSB_{CURRENT}/MSST	SSB_{MSY proxy}	0.89
Equilibrium MSY (lbs ww)	Equilibrium Yield @ F _{30% SPR}	2,236,983
Equilibrium OY proxy (lbs ww)	Equilibrium Yield @ 75%*F _{30% SPR}	2,103,591

The SSC recommended yield streams for all three of the possible rebuilding time scenarios so that the Council could determine which target date (8, 9, or 10 years) to adopt. Given the uncertainties in the assessment and projections, the SSC recommended acceptable biological catch (ABC) for 3 years (2017-2019) using a 40% probability of exceeding the overfishing limit (OFL) applied to the yield at F_{rebuild} (the yield that rebuilds the stock within 10 years or less). If there is not a new assessment by 2019, the SSC intends to reevaluate the ABC yield stream based on updated landings and any other new information available.

1.2 Assessment and Management History

A benchmark stock assessment was conducted in 2006 for the Gulf gray triggerfish stock (SEDAR 9 2006a). The assessment used the two scenarios of a Stock Production Model Incorporating Covariates and the State-Space Age-Structured Production Model (SSASPM). The assessment results indicated the stock was both overfished and experiencing overfishing (SEDAR 9 2006a). In October 2006, the NMFS notified the Council that the gray triggerfish stock was overfished and experiencing overfishing. This required that the Council take action to end overfishing and develop a rebuilding plan.

Reef Fish Amendment 30A (GMFMC 2008) put in place a stock rebuilding plan beginning in 2008 as required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Commercial and recreational ACTs¹, ACLs, and accountability measures (AMs) were also established in Amendment 30A. The sector-specific ACTs, ACLs, and landings are shown in Table 1.2.1. For the commercial sector, the in-season AM would close the fishing season within the year after the ACT (quota) is estimated to be met. If the commercial ACL is exceeded, the post-season AM is to reduce the ACL for the following year by the amount of overage the prior year. For the recreational sector, if the single year ACL or after 3-years of landings, the 3-year running average of the recreational ACL is exceeded, the post-season AM is to shorten the length of the fishing season the next year to the length estimated to land the ACT.

On June 10, 2013, NMFS implemented Amendment 37 (GMFMC 2012), that adjusted the commercial and recreational ACLs and ACTs, established a 12-fish commercial trip limit and a 2-fish recreational daily bag limit, established an annual fishing season closure from June 1 through July 31 for the commercial and recreational sectors, and revised the in-season AM for the recreational sector by eliminated the 3-year running average ACL. In addition, an overage adjustment for the recreational sector was added.

Since the implementation of Amendment 30A in 2008 and the reduction in sector ACTs in Amendment 37 (GMFMC 2012), the commercial sector has only exceeded its ACT (quota) in 2012 (Table 1.2.1). However, this has not been the case for the recreational sector. The recreational sector has exceeded its gray triggerfish ACL in 2008, 2011, 2012, 2013, 2014, and 2015. The ACLs for 2009 and beyond are based on an average of the Foy yield streams as established in Amendment 30A (GMFMC 2008).

¹ Because this amendment was developed before the new National Standard 1 guidelines (74 FR 3178) were published, the Council used the term target total allowable catch to describe what are now referred to as ACTs.

Table 1.2.1. Gulf of Mexico landings, ACTs, and ACLs for gray triggerfish during the eight years of the rebuilding plan.

Year	Recreational			Rec. Landings Moving Average	Commercial		
	Landings	ACT	ACL		Landings	ACT (Quota)	ACL
2008	419,276	306,000	394,000	419,000	76,569	80,000	105,000
2009	401,026	356,000	426,000	410,000	78,117	93,000	122,000
2010	296,358	405,000	457,000	372,000	55,661	106,000	138,000
2011	461,548	405,000	457,000	386,000	105,251	106,000	138,000
2012	279,874	217,100	241,200		71,948	60,900	64,100
2013	456,642	217,100	241,200		63,086	60,900	64,100
2014	217,885	211,093	186,993		42,532	60,900	64,100
2015*	114,059	30,107	54,207		47,480	60,900	64,100

Source: Landings provided by SERO. Data came from the most current commercial and recreational ACL datasets. Commercial landings came from December 24, 2015 commercial ACL dataset and recreational landings came from the March 17, 2016 recreational ACL dataset.

An update stock assessment was conducted for Gulf gray triggerfish in 2011 (SEDAR 9 Update 2011b). The same assessment model (SSASPM model) from the 2006 gray triggerfish benchmark assessment (SEDAR 9 2006a) was applied and three scenarios were explored: 1) re-run the same model but with updated landings, catch-per-unit-effort series including 2010, and updated indices of abundance; 2) additional updated age-length information; and 3) updated shrimp trawl bycatch and effort data.

The Council’s SSC reviewed the 2011 Update Assessment and accepted the second and third model scenarios listed above that used the updated age and length data and the shrimp trawl bycatch and effort data. At that time the status determination criteria and the estimated rebuilding timeframes were based on future recruitment adhering to maximum sustainable yield (MSY) proxy. The MSY proxy is defined as the fishing mortality rate at 30% spawning potential ratio ($F_{30\% SPR}$). Future yields are normally based on recruitment projections that depend in part on the spawner-recruit curve developed in the assessment. At time the update assessment was completed, gray triggerfish recruitment has been at low levels relative to the spawner-recruit curve (SEDAR 9 Update 2011b). The reason for low recruitment was unknown. Further, it was unknown whether recruitment in the near future will remain at these low levels or revert back to the levels projected by the spawner-recruit curve. At that time the SSC set the ABC based on a low recruitment time period (i.e., 2005 through 2009) for 2012 and 2013 of 305,300 lbs ww (http://gulfcouncil.org/resources/SSC_Reports.php). The corresponding overfishing limit

Spawning Potential Ratio (SPR)

The spawning potential ratio assumes that a certain amount of fish must survive and spawn in order to replenish the stock.

The spawning potential ratio is calculated as the average number of eggs per fish over its lifetime when the stock is fished compared to the average number of eggs per fish over its lifetime when the stock is not fished.

defined by the SSC was the yield at $F_{SPR30\%}$, equal to 401,600 lbs ww for these years. Results from the update stock assessment showed that the gray triggerfish stock is continuing to experience overfishing and the stock was considered overfished. In March 2012, NMFS informed the Council of the status of the gray triggerfish stock.

In response to this letter, the Council requested an interim rule for gray triggerfish be prepared for their April 2012 Council meeting that would reduce the recreational ACL to 241,200 lbs ww and recreational ACT to 217,100 lbs ww. The commercial ACL was reduced to 64,100 lbs ww and the commercial ACT (quota) was reduced to 60,900 lbs ww. The interim rule also established in-season closure authority for the recreational sector based on the ACT. Therefore, if the recreational gray triggerfish ACT is reached or projected to be reached within a fishing year, the Assistant Administrator for Fisheries can close the recreational sector from harvesting gray triggerfish the rest of the year (http://sero.nmfs.noaa.gov/bulletins/fishery_bulletins.htm). Amendment 30A (GMFMC 2008) had already established in-season closure authority for the commercial sector based on the ACT (quota). Following the implementation of the interim rule in May 2012, the recreational sector was closed on June 11 and the commercial sector was closed on July 1. The interim rule reduced fishing levels until long-term management measures were implemented through Amendment 37.

1.3 Purpose and Need

Purpose for Action

The purpose is to modify management measures and the timeline to rebuild gray triggerfish stock in the Gulf of Mexico.

Need for Action

To make adequate progress to rebuild an overfished stock, and to achieve, on a continuing basis, the optimum yield from the federally managed stock.

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 - Modify the Gulf of Mexico Gray Triggerfish Rebuilding Plan

Alternative 1: No Action. Maintain the gray triggerfish rebuilding plan at a constant fishing mortality rate defined as fishing mortality rate at optimum yield (F_{OY}) from the 2011 Update Assessment and Amendment 37.

Alternative 2: Modify the rebuilding plan to be the minimum number of years (T_{min}) to rebuild the stock based on a constant fishing mortality rate equal to zero starting in 2017. Using the Scientific and Statistical Committee (SSC) selected recruitment scenario the gray triggerfish stock is projected to recover to a biomass at 30% spawning potential ratio (i.e., spawning biomass is 30% of virgin biomass) in 6 years, by the end of 2022.

Alternative 3: Modify the rebuilding plan for gray triggerfish to rebuild the stock within 8 years or by the end of 2024.

Alternative 4: Modify the rebuilding plan for gray triggerfish to rebuild the stock within 9 years or by the end of 2025.

Alternative 5: Modify the rebuilding plan for gray triggerfish to rebuild the stock within 10 years or by the end of 2026.

Note: The modifications to the rebuilding plan are assumed to begin in 2017 based on the results of the SEDAR 43 (2015) standard assessment. The yield streams for this rebuilding period correspond to the 40th percentile of the Frebuild probability distribution functions.

Discussion:

2.2 Action 2 - Establish Annual Catch Limits and Annual Catch Targets for Gulf of Mexico Gray Triggerfish

The current interim sector allocations for gray triggerfish are 21% commercial and 79% recreational as established in Amendment 30A.

*Note: The decisions in Action 1 for rebuilding time period dictates the options that can be used in Alternative 3.

Alternative 1: No Action. Do not modify the gray triggerfish sector annual catch limits (ACLs) and annual catch targets (ACTs) from what was developed in Amendment 37 and has been in effect since 2012.

ABC	Commercial ACL	Recreational ACL
305,300 lbs ww	64,100 lbs ww	241,200 lbs ww
	Commercial ACT (quota)	Recreational ACT
	60,900 lbs ww	217,100 lbs ww

Alternative 2: Set sector ACLs and ACTs for gray triggerfish at zero pounds until a new stock assessment has been completed.

Alternative 3: Use the SSC's recommended rebuilding period of 8, 9, or 10 years from SEDAR 43 (2015).

Option a. Corresponds with the annual ABC's recommended for 2017 through 2019 by the SSC that are estimated to rebuild the gray triggerfish stock in 8 years or by the end of 2024. Use the ACL/ACT control rule buffer for each sector based on landings from 2012 through 2015. This results in an 8% buffer between the ACL and ACT for the commercial sector and a 20% buffer between the ACL and ACT for the recreational sector.

Year	ABC	Commercial ACL	Commercial ACT (quota)	Recreational ACL	Recreational ACT
2017	216,000	45,360	41,731	170,640	136,512
2018	227,000	47,670	43,856	179,330	143,464
2019	233,000	46,830	43,083	176,170	140,936

Option b. Corresponds with the annual ABC's recommended for 2017 through 2019 by the SSC that are estimated to rebuild the gray triggerfish stock in 9 years or by the end of 2025. Use the ACL/ACT control rule buffer for each sector based on landings from 2012 through 2015. This results in an 8% buffer between the ACL and ACT for the commercial sector and a 20% buffer between the ACL and ACT for the recreational sector.

Year	ABC	Commercial ACL	Commercial ACT (quota)	Recreational ACL	Recreational ACT
2017	399,000	83,790	77,087	315,210	252,168
2018	412,000	86,520	79,598	325,480	260,384
2019	417,000	87,570	80,564	329,430	263,544

Option c. Corresponds with the annual ABC's recommended for 2017 through 2019 by the SSC that are estimated to rebuild the gray triggerfish stock in 10 years or by the end of 2026. Use the ACL/ACT control rule buffer for each sector based on landings from 2012 through 2015. This results in an 8% buffer between the ACL and ACT for the commercial sector and a 20% buffer between the ACL and ACT for the recreational sector.

Year	ABC	Commercial ACL	Commercial ACT (quota)	Recreational ACL	Recreational ACT
2017	546,000	114,660	105,487	431,340	345,072
2018	554,000	116,340	107,033	437,660	350,128
2019	555,000	116,550	107,226	438,450	350,760

Alternative 4: Use the SSC recommendation of average ABC yield streams for 2017 through 2019 for each of rebuilding periods (8, 9, and 10 years). Use the ACL/ACT control rule buffer for each sector based on landings from 2012 through 2015. This results in an 8% buffer between the ACL and ACT for the commercial sector and a 20% buffer between the ACL and ACT for the recreational sector.

Option a. Corresponds with the mean ABC projections to rebuild the stock in 8 years or by the end of 2024.

Option b. Corresponds with the mean ABC projections to rebuild the stock in 9 years or by the end of 2025.

Option c. Corresponds with the mean ABC projections to rebuild the stock in 10 years or by the end of 2026.

Options	Year	ABC Mean (2017-2019)	Commercial ACL	Commercial ACT (quota)	Recreational ACL	Recreational ACT
Option a	8-year	225,333	47,320	43,534	178,013	142,410
Option b	9-year	409,333	85,960	79,083	323,373	258,698
Option c	10-year	551,667	115,850	106,582	435,817	348,654

2.3 Action 3 - Modify the Recreational Fixed Closed Season for Gulf of Mexico Gray Triggerfish

Alternative 1: No Action. Do not modify the gray triggerfish current closed season for the recreational sector of June 1 through July 31.

Alternative 2: Modify the gray triggerfish closed season for the recreational sector to be from June 1 through August 31.

Alternative 3: Modify the gray triggerfish closed season for the recreational sector to be from January 1 through July 31.

2.4 Action 4 - Modify the Recreational Bag Limit for Gulf of Mexico Gray Triggerfish

Alternative 1: No Action. Do not modify the recreational daily bag limit of 2 gray triggerfish per angler within the 20-reef fish aggregate bag limit.

Alternative 2: Adjust the recreational daily bag limit to be 1 gray triggerfish per angler within the 20-reef fish aggregate bag limit.

2.5 Action 5 - Modify the Recreational Minimum Size Limit for Gulf of Mexico Gray Triggerfish

Alternative 1: No Action. Do not modify the gray triggerfish recreational minimum size limit of 14 inches fork length (FL).

Alternative 2: Increase the recreational minimum size limit for gray triggerfish to 15 inches FL.

Alternative 3: Increase the recreational minimum size limit for gray triggerfish to 16 inches FL.

2.6 Action 6 - Modify the Commercial Fixed Closed Season for Gulf of Mexico Gray Triggerfish

Alternative 1: No Action. Do not modify the gray triggerfish current closed season for the commercial sector of June 1 through July 31.

Alternative 2: Modify the gray triggerfish closed season for the commercial sector to be from March 1 through July 31.

Alternative 3: Modify the gray triggerfish closed season for the commercial to be from June 1 through August 31.

2.7 Action 7 - Modify the Commercial Trip Limit for Gulf of Mexico Gray Triggerfish

Alternative 1: No Action. Maintain the commercial trip limit of 12 gray triggerfish per vessel per day.

Alternative 2: Increase the commercial trip limit for gray triggerfish to 14 fish per vessel per day.

Alternative 3: Decrease the commercial trip limit for gray triggerfish to 10 fish per vessel per day.

Chapter 3. References

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