

Predicting Future Landings for the Gulf of Mexico Gray Triggerfish Recreational Sector

LAPP/DM Branch
NOAA Fisheries Service
Southeast Regional Office

Introduction

Gray triggerfish (*Balistes capriscus*) are one of 31 reef fish species in the 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.

The Council approved a Framework in January 2021 increasing the gray trigger recreational Annual Catch Limit and Annual Catch Target (ACT). The new ACT is 274,323 pounds whole weight (lbs ww). The Council is now considering another Framework Action to modify the gray triggerfish recreational sector seasonal closures. A prediction of future landings are needed to explore seasonal closure options.

Data Sources

Recreational landings data for Gulf of Mexico gray triggerfish were obtained from the Marine Recreational Information Program (MRIP), the Texas Parks and Wildlife Department Creel Survey (TPWD), Louisiana Creel survey (LA Creel), and the Headboat Survey (Headboat). MRIP, TPWD, and LA Creel generate recreational landings estimates for charter, private, and shore modes. Headboat uses logbooks completed by headboat operators to generate recreational landings for headboats.

Predicted Future Landings

In the past eight years (2012-2019) the Gulf of Mexico gray triggerfish recreational sector has had a closure and was not open the full calendar year. Different years had different closure dates. Some states followed the federal closures (e.g., Mississippi) and some states ignored the federal closures (e.g., Texas). Also, some states sometimes went compatible with the federal gray triggerfish recreational closures and then other times ignored the federal closures (e.g., Florida). The different closure dates and variation in compatibility of state and federal closures made it difficult to predict future landings.

As stated earlier, the Gulf of Mexico recreational landings are a combination of data from four different recreational surveys (MRIP, TPWD, LA Creel, and Headboat). The majority (> 90%) of the Gulf of Mexico gray triggerfish recreational landings come from MRIP which is organized by two-month wave (January/February, March/April). The predicted future landings were organized by two-month wave and then broken up into individual months by assuming a uniform distribution of landings within the two-month wave. Additionally, all of the MRIP data used in this analysis is from the MRIP Coastal Household Telephone Survey (CHTS) because the ACTs considered in the Framework Action are based on MRIP CHTS data.

On January 16, 2018 Final Amendment 46 to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico (Amendment 46) implemented changes to the Gulf of Mexico gray triggerfish recreational fishing regulations. Amendment 46 reduced the recreational bag limit from 2-fish per person per day to 1-fish per person per day, increased the recreational minimum size limit from 14 to 15-inches fork length, and created a January through February recreational closed season. Due to the recent changes to the Gulf of Mexico gray triggerfish recreational sector from Amendment 46 there is a priority to use the recent data from 2018 and 2019 when the recreational sector was open. This is because this recent data has been impacted by the fishery changes from Amendment 46.

Since Amendment 46 implemented a January through February closure in 2018 landings for these two months came from the most recent two years when the recreational sector was open in January and February. In both 2014 and 2016 the gray triggerfish recreational sector was open during the entire January through February time period. No January and February data from 2015 were used because the recreational sectors was closed in 2015 on February 7th. The January and February data from 2014 and 2016 were adjusted to account for the Amendment 46 size limit and bag limit changes. The data were modified by using the Amendment 46 analysis results that were done for Amendment 46. The Amendment 46 analysis had percent reductions of 16% for the size limit and 8% for the bag limit that were applied to the January and February 2014 and 2016 data.

The recreational sector was open in March and April of 2018 and 2019. An average of the landings from these two years were used to generate predicted future landings for March and April.

The gray triggerfish recreational sector was open in May of 2018 and these landings are used for the predicted future May landings. The recreational sector was closed in the month of June in 2018 due to a fixed closure. Predicted future landings for June came from determining the daily catch rate from May of 2018 and then applying it to the total number of days in June (30 days) to predict future landings for June. Table 1 provides a description of the data used to predict the landings for each month.

Table 1. Description of the data used to predict future Gulf of Mexico gray triggerfish recreational landings.

Time Period	Predicted Landings Data come from:
January through February	2014 and 2016 data adjusted for the Amendment 46 change in the size and bag limit
March through April	Average of 2018 and 2019 data
May	2018 data
June	Assumed same daily catch rate as May of 2018 and applied to the number of days in June

No landings predictions were made from July to December. This is because the last time the recreational sector was open in July and August was in 2013, and the last time the recreational sector was open in September to December was in 2011. Since 2011 and 2013 there have been management changes to the recreational sector. There were two bag limit reductions (in 2016 and 2018), and there was an increase in the size limit in 2018. Additionally the average size of gray triggerfish has changed over time (SEDAR 43). Therefore, due to the lack of data and changes to the fishery over the past decade no landing predictions were made for July to December.

The uncertainty in the predicted landings were explored by evaluating the variability of the annual landings estimates. This was conducted using the mean proportion standard error (PSE) for the landings estimates generated from the MRIP dataset. This was done to match the same time period used to generate future landings. For example, predicted landings for January and February were generated from 2014 and 2016 so the average PSE for these two months were generated from the same months and same years. The PSE values were used to generate 95% confidence intervals around the predicted landings. Table 2 and Figure 1 show the predicted landings along with the upper and lower 95% confidence intervals.

Table 2. Gulf of Mexico recreational gray triggerfish predicted landings by month, and the upper and lower 95% confidence intervals. No landing predictions were made for July through December because of lack of recent landings and high uncertainty of landings for this time period.

	January	February	March	April	May	June	Total
Predicted Future Landings	37,866	34,202	108,142	104,654	230,932	223,483	739,278
Lower 95% Confidence Interval	28,311	24,647	102,174	98,686	220,074	212,624	686,515
Upper 95% Confidence Interval	47,421	43,757	114,110	110,622	241,790	234,341	792,042

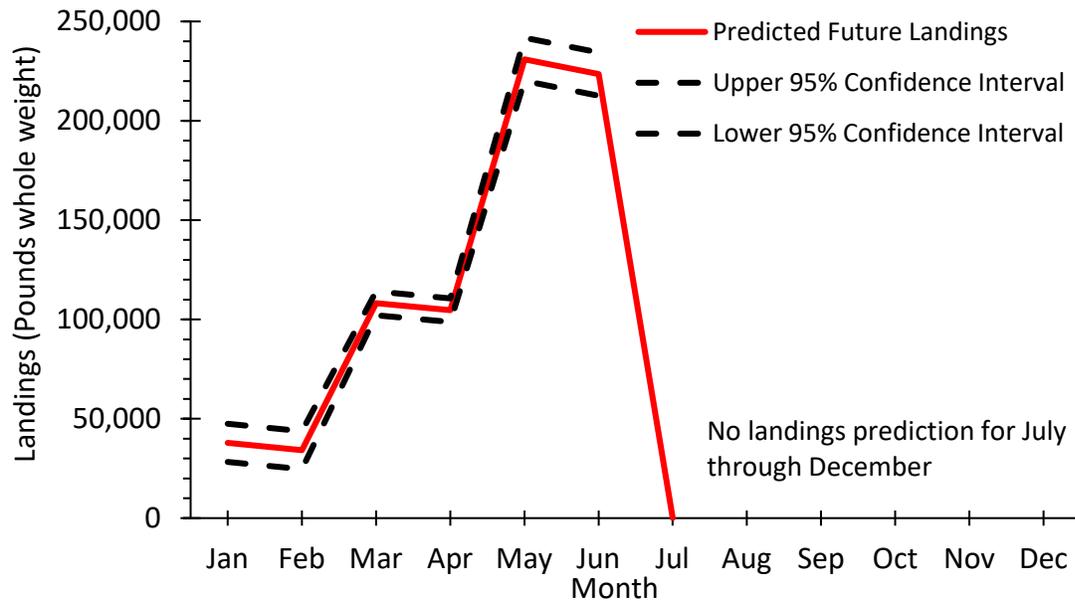


Figure 1. Gulf of Mexico recreational gray triggerfish predicted landings by month. The red line is the predicted landings and the black dashed lines are upper and lower 95% confidence intervals. No landing predictions were made for July through December because of lack of recent landings and high uncertainty of landings for this time period.

Seasonal Closure Analysis

The predicted landings and the 95% confident intervals were cumulatively summed to determine when the ACT of 274,323 lbs ww would be reached for different seasonal closure alternatives. The results reveal that the ACT under different closures is expected to be reached in either April or May (Table 3).

Table 3. Predicted Gulf of Mexico recreational gray triggerfish closure dates using the Action 1 alternative ACTs of the Framework Action.

Alternative	Closure Period	Closure Dates		
		Predicted Landings	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Alternative 1	January 1 through end of February, June 1 through July 31	9-May	11-May	7-May
Alternative 2	January 1 through January 31, June 1 through July 31	4-May	7-May	1-May
Alternative 3	February 1 through end of February, June 1 through July 31	4-May	7-May	1-May
Alternative 4	June 1 through July 31	27-Apr	3-May	19-Apr