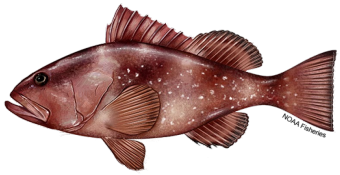

Projection Scenarios for Gulf Red Grouper

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April 2025

Keywords

Catch Advice, Red Grouper, Gulf, SRFS Recreational Landings, SEDAR 61, SEDAR 88

Abstract

This document describes both the adjustment of SEDAR61 assessment catch advice in the units used in the most recent Gulf Red Grouper Operational Assessment (SEDAR 88) and updated catch advice beginning in 2025 (*http://sedarweb.org/sedar-88*). SEDAR 88 replaced the time series of Florida-caught private recreational landings and discards from the Marine Recreational Information Program Fishing Effort Survey (MRIP-FES)-based estimates with the Florida State Reef Fish Survey (SRFS) estimates. This represents a change to the 'currency' of recreational catches. Adjusted catch advice for SEDAR 61 is presented here in SRFS units for comparison purposes. The catch advice provided for SEDAR 88 began in 2027; this advice has been updated to begin in 2025.

Introduction

The recent Gulf Red Grouper Operational Assessment (SEDAR 88) was presented to the Gulf Fishery Management Council's Scientific and Statistical Council (SSC) in February, 2025. The assessment was found to be consistent with the best scientific information available and considered appropriate for management advice by the SSC. Several changes were made to both the data inputs and model configurations used in SEDAR61, and these changes are fully outlined in the Stock Assessment Report for SEDAR 88 (SEDAR 2025; *http://sedarweb.org/sedar-88*). SEDAR 88 implemented a number of new or improved procedures and methodologies including the following:

- Revised estimates of commercial landings and discards
- Revised estimates of recreational landings and discards (via SRFS)
- Incorporated yearly error estimates in landings and discards to better reflect uncertainties
- Updating the age composition weighting procedures
- Re-evaluating and estimating steepness
- Estimating the growth curve internally within Stock Synthesis

- Utilized the Dirichlet-multinomial error distribution for composition data (Thorson et al. 2017)
- Updated the natural mortality point estimate to current best practices
- Used age selectivity on the fleets with weighted age compositions
- Used empirical selectivity-at-age for red tide years which were informed by the West Florida Shelf Ecospace Model
- Extended population age bin to maximum age of 29

Collectively, these changes to data inputs and model parameterization greatly affected the assessment results and improved many aspects of model performance for the SEDAR 88 assessment model.

Materials and Methods

Base Model

The Standard SEDAR61 stock assessment (SEDAR 2019,: *http://sedarweb.org/sedar-61*) for Red Grouper fit to recreational landings in numbers of fish (see Figure 4.2 in Full SEDAR61 Stock Assessment Report). Gulf assessments have traditionally fit to recreational landings in numbers as numbers are the native units of recreational monitoring surveys. A comparison between mean size of landed Red Grouper predicted by the SEDAR61 assessment model and the ACL monitoring dataset revealed that the SEDAR61 assessment model underpredicted the size of landed Red Grouper. The underestimation was caused by the growth curve, which was externally fit and fixed in the assessment model, and the assumed distribution regarding the variability-at-length (i.e., the coefficient of variation). The SEDAR61 assessment model ultimately inferred the weights, which were lower than observed in the ACL monitoring dataset. For SEDAR88, the mean weight of the recreational private mode landings was included and fit to in order to provide the model more information on the size of the recreational landings.

The SEDAR 61 base model was used to run the projections in this exercise with two different projection configurations: 1. The base model and projection specifications used to develop Amendment 53 and, 2. the base model and projection specifications used to develop mean-weight adjusted catch advice which was later used in the 2021 Interim Analysis (SEFSC, 2021).

The SEDAR 88 base model was used to run the projections with management beginning in 2025 as opposed to 2027 (SEDAR, 2025).

Recreational Landings and Discards

The recreational landings and discards data used in SEDAR61 were replaced with the SEDAR88 recreational landings and discards data through the terminal year of the old assessment model (2017). The interim landings used to run the projections in SEDAR61 replaced the MRIP Florida private mode landings with SRFS private mode landings for years 2018 and 2019 as these were the years with available interim landings for SEDAR61.

Projections

SEDAR 61

For both sets of SEDAR 61 projections, the retained yields were projected starting in 2020 under assumed conditions of recent average recruitment, catch allocations of 59.3% commercial and 40.7% recreational (GMFMC 2021), selectivity and retention similar to 2017, and assuming the 2018 red tide event had a similar impact on the population as the 2005 red tide event. Additional details on projection specifications are provided in Section 5.2 of the Full SEDAR 61 Stock Assessment Report. For SEDAR 61, the OverFishing Limit (OFL) was set as the average projected yield between 2020 and 2024 for the projection achieving 30% spawning potential ratio in equilibrium.

The catch advice presented herein are based on:

1. The projections using SRFS data in the original SEDAR 61 assessment model

2. The projections using SRFS data in the SEDAR 61 assessment model using the adjusted recreational weight of landings (SEFSC 2021).

SEDAR 88

The simulated dynamics used for projections assumed nearly identical parameter values and population dynamics as the SEDAR 88 OA Base Model. Projections were run assuming that relative *F* and selectivity associated with the last three years (2020-2022) would remain the same into the future. Forecast recruitment values were derived from the model-estimated Beverton-Holt stock-recruit relationship.

The terminal year of SEDAR 88 was 2022 and the first year of management advice is 2025. Retained catch for the interim years (2023-2024) used landings estimates for 2023 and the average of the last three years of retained catches (2021-2023) for 2024.

$F_{30\%SPR}$ and F_{MSY} were determined using a long-term 100-year projection assuming that equilibrium was obtained over the last 10 years (2113-2122). For the OFL projection, the $F_{40\%SPR}$ was applied to the stock starting in 2025. The fleet allocations for Red Grouper are 59.3% commercial and 40.7% recreational per Amendment 53 (GMFMC 2023).

Results and Discussion

Adjustment to Projected Yield Streams, OFL and ABC

SEDAR 61

The projections run from the original SEDAR 61 assessment model with SRFS landings and discards results in an OFL of 4.21 million pounds gutted weight and an ABC of 3.86 million pounds gutted weight (**Table 1**).

The projections run from the SEDAR 61 assessment model with the adjusted recreational weight of landings with SRFS landings and discards results in an OFL of 5.40 million pounds gutted weight and an ABC of 5.02 million pounds gutted weight (**Table 1**).

For comparison, the SEDAR 61 results adjusted for the mean weight correction has an OFL of 5.99 million pounds gutted weight and an ABC of 5.57 million pounds gutted weight, which was adjusted down to 4.96 million pounds gutted weight in the 2021 Interim Analysis for Red Grouper (GMFMC 2022).

Several updates and improvements were made in SEDAR 88 and it is impossible to reproduce the effect of these changes on the projections obtained from SEDAR 61. A full discussion of the bridging analysis and sensitivity runs for SEDAR 88 can be found in sections 4.8.6-4.8.8 in the SEDAR 88 Stock Assessment Report (SEDAR, 2025).

SEDAR 88

The projections run from the SEDAR 88 assessment model with management beginning in 2025 results in an OFL of 10.64 million pounds gutted weight and an ABC of 8.28 million pounds gutted weight (**Table 2** and **Figure 1**). As a comparison, the projections with management beginning in 2027 results in an OFL of 11.28 million pounds gutted weight and an ABC of 8.78 million pounds gutted weight.

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Tables

Table 1. Catch advice provided for SEDAR 61 using SEDAR 88 SRFS landings and discards (OFL and ABC values in millions pounds gutted weight). S61 MRIP-FES row shows original S61 projections at 30% SPR with FES units followed by that projection run using SRFS data (SRFS equivalent for MRIP-FES (Amendment 53)). Current MRIP - FES units (Interim Analysis) row has the current advice in FES with the adjusted mean weight for recreational landings at 30% SPR followed by that projection run using the SRFS data. The final two rows are the current advice obtained from the projections from SEDAR 88. **Note, allocation for all catch advice in table set at 59.3 commercial and 40.7 recreational.**

	OFL	ABC	ACL
S61 MRIP-FES units (Amendment 53)	4.66	4.26	4.26
S61 SRFS equivalent for MRIP-FES (Amendment 53)	4.21	3.86	
Current MRIP - FES units (Interim Analysis)	5.99	4.96	4.96
S61 SRFS equivalent for MRIP-FES units (adjusted mean weights)	5.40	5.02	
New Advice (S88) 40% SPR in SRFS units	11.28	8.78	8.78
New Advice (S88) 30% SPR in SRFS units	14.04	11.06	

Table 2. Catch advice provided for SEDAR 88 with management advice beginning in 2027 (top row) and 2025 (bottom). **Note, allocation for all catch advice in table set at 59.3 commercial and 40.7 recreational.**

	OFL	ABC	ACL
SEDAR 88 40% SPR (management starting 2027)	11.28	8.78	8.78
SEDAR 88 40% SPR (management starting 2025)	10.64	8.28	8.28

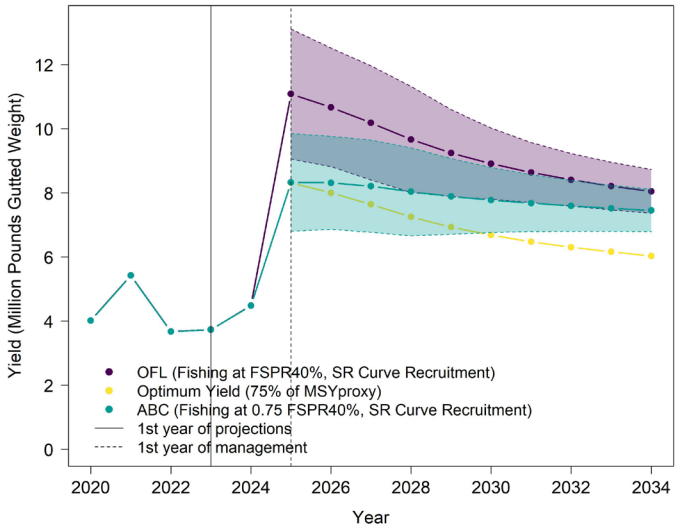

Figure 1. *Historic (2020-2022), interim (2023-2024) and forecasted yields (2025+) for the OFL (fishing set at F40%SPR) and ABC (directed F = 0.75 x Directed F at F40%SPR) projections.*