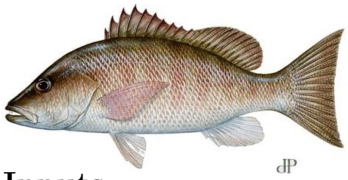
Gulf of Mexico Gray Snapper (*Lutjanus griseus*)

SouthEast Data, Assessment, and Review (SEDAR) 75 Summary

Gulf SSC Review Completed January 2023



Data Inputs

Recreational and commercial landings and dead discards predicted by the assessment model are shown (Figure 1). Recreational removals were updated using the Fishing Effort Survey. Indices of relative abundance were included from multiple sources (Figure 2).

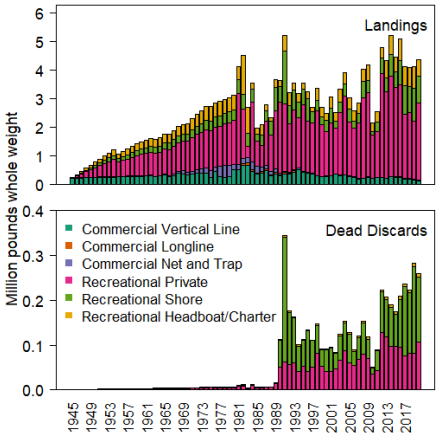


Figure 1: Final landings and dead discard estimates from the SEDAR 75 Operational Assessment model for commercial and recreational fisheries in millions of pounds, 1945-2020.

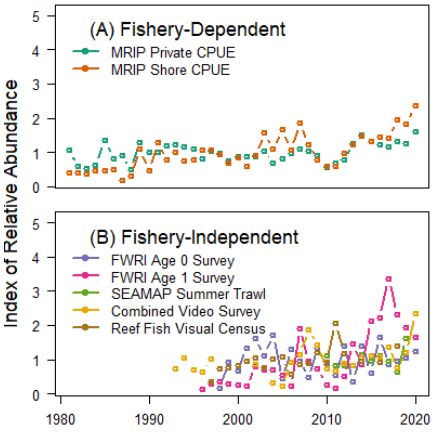


Figure 2: Fishery-dependent (A) and -independent (B) indices of abundance input into the SEDAR 75 Operational Assessment model.

Stock Status

The assessment found that Gray Snapper in the Gulf is not overfished and not undergoing overfishing as of 2020 using a Spawner Potential Ratio of 26% (Figure 3). Benchmarks including the Maximum Fishing Mortality Threshold (MFMT) and Minimum Stock Size Threshold (MSST) are defined in Table 1.

Table 1: Benchmarks from the SEDAR 75 Operational Assessment model. Spawning Stock Biomass (SSB) = metric tons, F = harvest rate (total biomass killed / total exploitable biomass).

Benchmarks	
Spawner Potential Ratio (SPR)	26%
Natural Mortality Rate (M)	0.15
MFMT = $F_{MSYproxy}$	0.16
$F_{2018-2020}$/ MFMT	0.56
Overfishing (F/MFMT> 1)?	No
$SSB_{MSYproxy}$	5,607
MSST = (0.5)*$SSB_{MSYproxy}$	2,803
$SSB_{2020}/SSB_{Unfished}$	0.48
SSB_{2020}/MSST	3.69
Overfished (SSB/MSST< 1)?	No

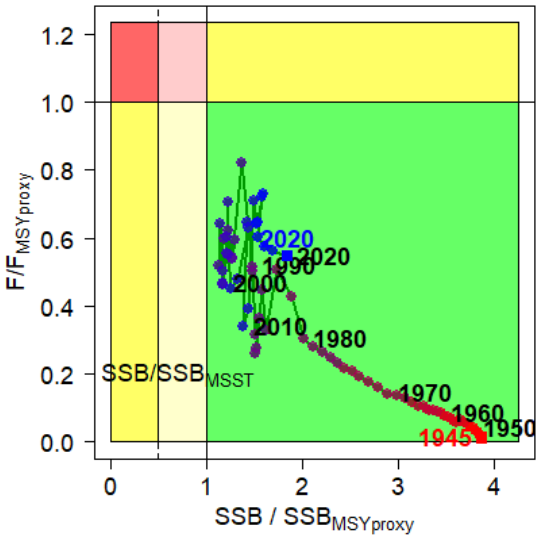


Figure 3: Kobe plot showing the progression of exploitation status of Gulf Gray Snapper from 1945 (red) to 2020 (blue), with MSST denoted.

Assessment Outcome

The Gulf of Mexico Fishery Management Council's Scientific and Statistical Committee (SSC) accepted the SEDAR 75 Operational Assessment model as the best scientific information available, and deemed it appropriate for providing management advice (Tables 1-2).

Projections

Final projections were run using an MSYProxy of 26% SPR, the reported landings for 2021, and using the average of 2019-2021 landings for 2022 and 2023 for each fleet. Forecast recruitment values were derived from the Beverton-Holt stock-recruitment relationship with fixed steepness, with recruitment values estimated in the assessment model from 1945-2020 (Figure 4).

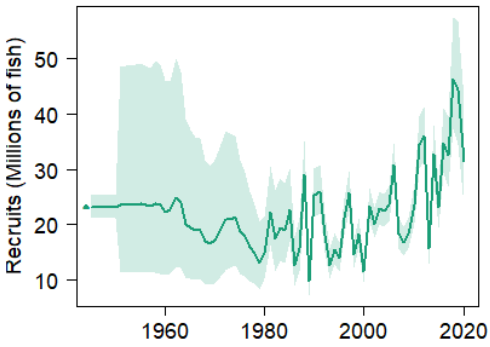


Figure 4: Annual and virgin (dot) recruitments estimated by the SEDAR 75 Operational Assessment model with uncertainty estimates (shading).

Table 2: SSC recommended catch levels for the Overfishing Limit (OFL; yield at FMSYproxy) and the Acceptable Biological Catch (ABC; yield at 75% FMSYproxy) for 2024-2028 (shown in Figure 5). Catch units are million pounds whole weight (mp ww).

Yr	OFL	ABC
2024-2028	7.547	6.226

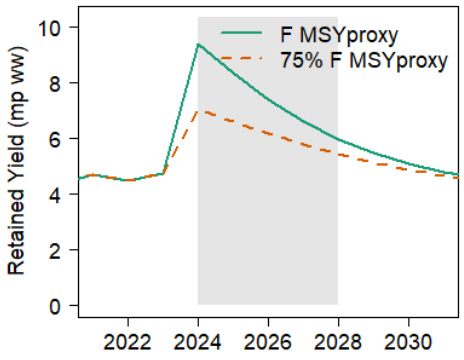


Figure 5: Retained yields from the OFL and ABC projections with the years highlighted (in gray) for catch advice.