# Gulf of Mexico Cobia (*Rachycentron canadum*)

## SouthEast Data, Assessment, and Review (SEDAR) 28 Update Summary

Gulf SSC Review Completed July 2020

## 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 two fishery-dependent sources, as no fishery-independent indices were available (Figure 2).

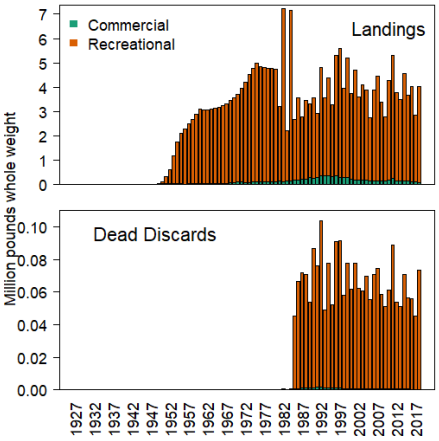


Figure 1: Final landings and dead discard estimates from the SEDAR 28 Update model for commercial and recreational fisheries in millions of pounds, 1927-2018.

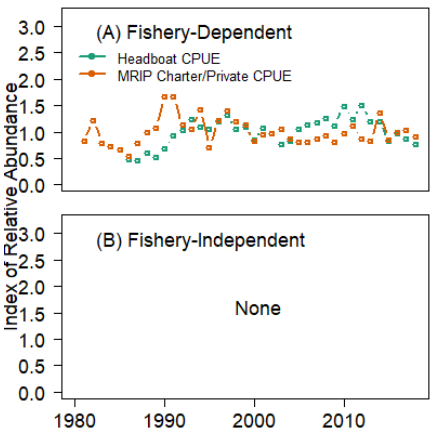


Figure 2: Fishery-dependent (A) and -independent (B) indices of abundance input into the SEDAR 28 Update model.

## Stock Status

The assessment found that Cobia in the Gulf is not overfished but undergoing overfishing as of 2018 using a Spawner Potential Ratio of 30% (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 28 Update model. Spawning Stock Biomass (SSB) = metric tons, F = harvest rate (total biomass killed / total exploitable biomass).

| **Benchmarks** | |
|---|---|
| Spawner Potential Ratio (SPR) | 30% |
| Natural Mortality Rate (M) | 0.38 |
| MFMT = $F_{MSYproxy}$ | 0.23 |
| $F_{2016-2018}$/ MFMT | 1.43 |
| Overfishing ($F$/MFMT> 1)? | Yes |
| $SSB_{MSYproxy}$ | 5,406 |
| MSST = $(1-M)*SSB_{MSYproxy}$ | 3,352 |
| $SSB_{2018}/SSB_{Unfished}$ | 0.21 |
| $SSB_{2018}$/MSST | 1.11 |
| Overfished (SSB/MSST< 1)? | No |

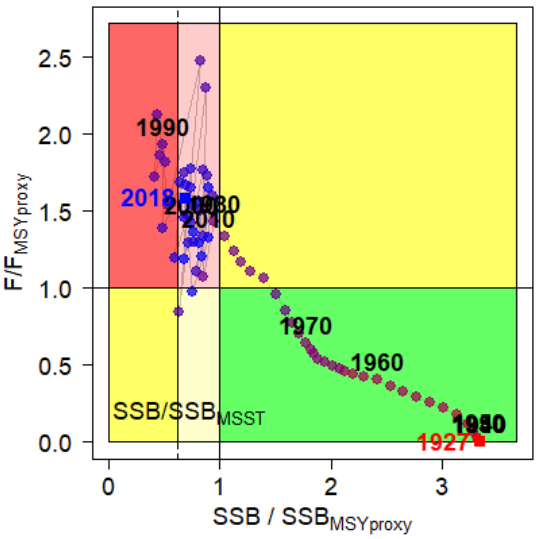


Figure 3: Kobe plot showing the progression of exploitation status of Gulf Cobia from 1927 (red) to 2018 (blue), with MSST denoted.

## Assessment Outcome

The Gulf of Mexico Fishery Management Council's Scientific and Statistical Committee (SSC) accepted the SEDAR 28 Update 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 30% SPR, using the reported landings for 2019, and using the average of 2017-2019 landings as the proxy for the interim projection year of 2020 for each fleet. For determining catch advice, the SSC supported using the mean recruitment over the last 10 years where estimated, which was below the mean of the time series where recruitment was estimated (Figure 4).

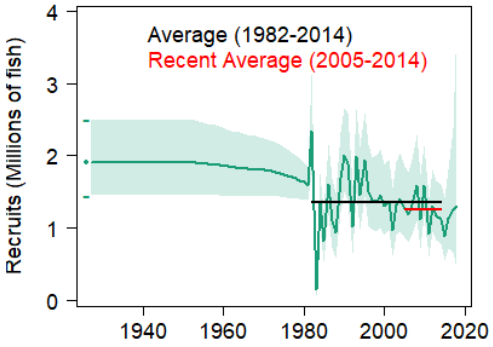


Figure 4: Annual and virgin (dot) recruitments estimated by the SEDAR 28 Update model with uncertainty estimates (shading).

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 2022+ (shown in Figure 5). Catch units are million pounds whole weight (mp ww).

| Yr | OFL | ABC |
|---|---|---|
| 2022 | 3.21 | 2.6 |
| 2023+ | 3.31 | 2.76 |

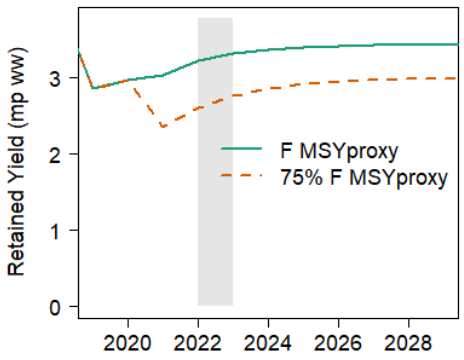


Figure 5: Retained yields from the OFL and ABC projections with the years highlighted (in gray) for catch advice.