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).
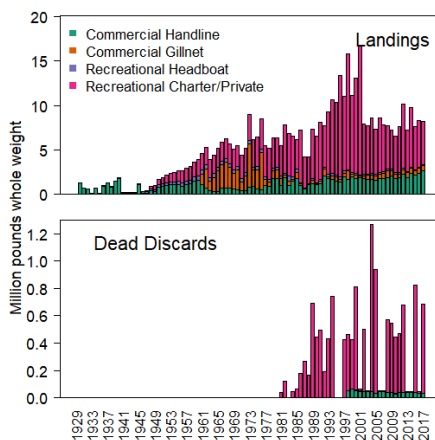

Figure 1: Final landings and dead discard estimates from the SEDAR 38 Update model for commercial and recreational fisheries in millions of pounds, 1929-2017.
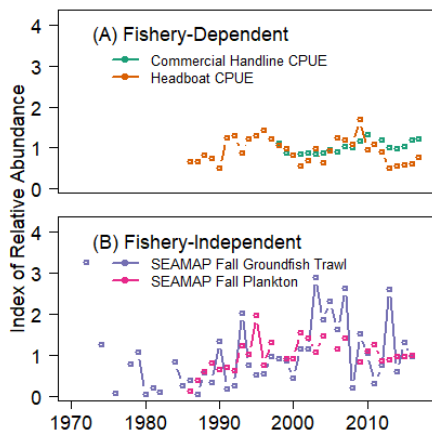

Figure 2: Fishery-dependent (A) and -independent (B) indices of abundance input into the SEDAR 38 Update model.

Stock Status

The assessment found that King Mackerel in the Gulf is not overfished and not undergoing overfishing as of 2017 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 38 Update model. Spawning Stock Biomass (SSB) = billions of eggs, F = harvest rate (total biomass killed / total exploitable biomass).

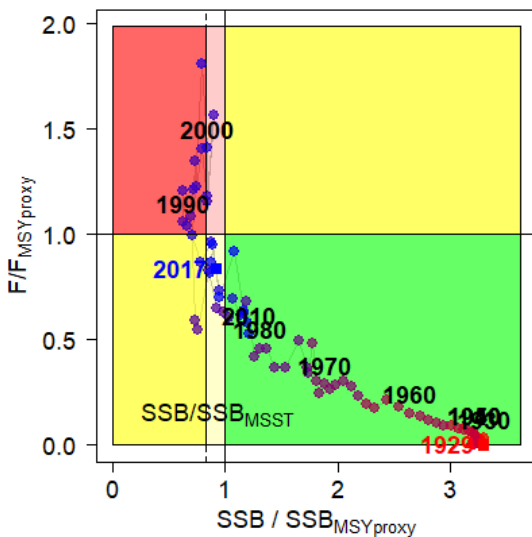| Benchmarks	
Spawner Potential Ratio (SPR)	30%
Natural Mortality Rate (M)	0.17
$MFMT = F_{MSYproxy}$	0.167
$F_{2015-2017}$/ MFMT	0.84
Overfishing (F/MFMT> 1)?	No
$SSB_{MSYproxy}$	1,714
$MSST = (1-M)*SSB_{MSYproxy}$	1,416
$SSB_{2017}/SSB_{Unfished}$	0.28
SSB_{2017}/MSST	1.12
Overfished (SSB/MSST< 1)?	No

Figure 3: Kobe plot showing the progression of exploitation status of Gulf King Mackerel from 1929 (red) to 2017 (blue), with MSST denoted.

Assessment Outcome

The Gulf of Mexico Fishery Management Council's Scientific and Statistical Committee (SSC) accepted the SEDAR 38 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, with catches in 2018-2020 arrived at by exploiting the 2018-2020 projected stock size by the 2017 estimated exploitation rate. All projections assumed that recruitment would remain constant at the unfished level of 7.68 million fish per year (Figure 4).
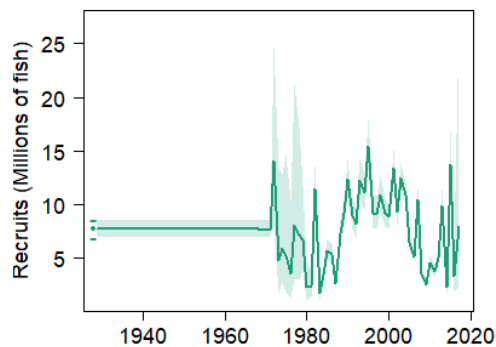

Figure 4: Annual and virgin (dot) recruitments estimated by the SEDAR 38 Update model with uncertainty estimates (shading).

Table 2: SSC recommended catch levels for the Overfishing Limit (OFL; yield at FMSYproxy) and the Acceptable Biological Catch (ABC; yield at 85% FMSYproxy) for 2021-2023 (shown in Figure 5). Catch units are million pounds whole weight (mp ww).

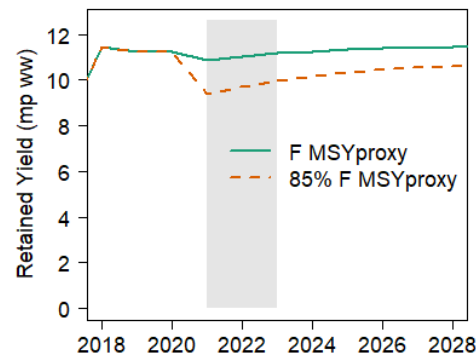| Yr	OFL	ABC
2021	10.89	9.37
2022	11.05	9.72
2023	11.18	9.99

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