

SEDAR 72 Assessment Workshop Webinar IV
Gulf of Mexico Gag
July 12, 2021 from 1:00 PM to 3:00 PM
Summary Report

Base Model

Commercial age composition has been input as nominal ages, as in SEDAR 33U, which has resulted in improved coefficients of variance (CVs) on the overall age composition and age-specific mortality due to red tide. Originally, the commercial age composition was input as conditional age at length, which assumes each age observation is from a random sample; this assumption is likely being violated. This resulted in overestimated asymptotic lengths, and a conflict between age and length composition data. Another pattern observed was an issue when increasing the CVs on recreational catches to better encapsulate the uncertainty expected there. Reverting to nominal ages for the commercial data has resolved these issues.

The CVs on the recreational catches have been increased to 0.2, and the commercial vertical line selectivity was changed to a lognormal from double lognormal, which improved model stability. The base model uses updated catch and effort data; time blocks to account for management changes; updated life history parameters for growth, M, maturity, and hermaphroditism; red tide effects for 2014 and 2018; Dirichlet weighting on age composition data; bias adjustments for recruitment deviations; and Francis reweighting for indices. An asymptote has been estimated for the retention functions due to reduced fishing seasons for the recreational fleet. Still, retention was not able to be estimated for the private recreational fleet in any year, thereby assuming the recreational fleet will retain any fish greater than the minimum size. Input was received stating that the private recreational fleet possessed the same ability to avoid gag out of season as other directed fleets.

Landings for gag, both commercial and recreational, are lower than typical as a proportion of the sector ACLs for the last several years. Fits to length composition data are good for directed fleets, and moderate to poor for fishery-independent indices. Fits to age composition data for the directed fleets are moderate, with peaks in the distribution tending to be underestimated. Recruitment has remained below average since 2009. Diagnostics indicate some deviation in the end-year model estimate of spawning stock biomass in the retrospective pattern analysis, indicating a reliance on estimates from the most recent years by the base model. Similar deviations are also seen for recruitment estimates. Jitter analyses show good model stability when input parameters are varied by up to 10%.

Sensitivity analyses include examining SSB as total biomass versus females only. Little difference has been observed in terminal year recruitment and SSB, with the portion of the unfished biomass estimated to be lower under the SSB-combined scenario. Decreasing the estimate of natural mortality decreases estimates for annual recruitment, but results in a negligible difference in total SSB. Using the combined Gulf fishery-independent video survey index reduces the CVs overall for estimates of SSB and recruitment, and for the model overall, but does not appear to result in marked differences in terminal year SSB or recruitment; however, it does indicate a less severe effect of the 2018 red tide. When private recreational retention mirrors the headboat fleet's retention, annual estimates of recruitment are significantly

higher for many years, as are estimates of fishing mortality. However, retention for the private fleet should not be assumed the same for headboats, due to differences in practices in general between the fleets, and the ability to be nimble and avoid gag during closed seasons. Modifying the selectivity at age for red tide mortality resulted in an improvement in the uncertainty in the annual estimates of mortality, and describes a subdued effect of that mortality on the stock.

The last sensitivity analysis looked at using the FWC Gulf Reef Fish Survey (now the State Reef Fish Survey) instead of the MRIP-FES data for private recreational catch and effort. The magnitude of landings was much lower for GRFS than for MRIP. Due to input from FWC being needed to better understand the effort portion of the equation for comparing the data, further exploration on this sensitivity analysis will be included in the assessment workshop report.

Projection settings were reviewed, specifically the definition of the minimum stock size threshold (50% of BMSY, with MSY being defined as a proxy of FMAX), the start year, and how to handle interim projection years. Projections will begin in 2023, with preliminary data used for 2020, and the three-year average of landings for 2018 – 2020 used for 2021 and 2022. It would be expected that the SSC will review the SEDAR 72 assessment in September 2021, and any rebuilding plans and projections in January 2022.

SEDAR 72 will be reviewed by the Gulf Council's SSC at its meeting on August 9 – 11, 2021
