Gulf of Mexico Fishery Management Council
Standing, Reef Fish, Socioeconomic, and Ecosystem SSC

Review of SEDAR 85: Gulf of Mexico Yellowedge Grouper
Meeting Summary
February 27 – 28, 2024

Review of SEDAR 85: Gulf of Mexico Yellowedge Grouper

Model review and SSC discussion

Dr. Skylar Sagarese (Southeast Fisheries Science Center [SEFSC]) provided an overview of the yellowedge grouper stock assessment (SEDAR 85) model data inputs, results, diagnostics and sensitivity analyses. The terminal data year of the assessment was 2021. Including updates and improvements to the stock assessment model (relative to SEDAR 22) and recreational landings data collected through the Marine Recreation Information Program Fishing Effort Survey (MRIP-FES).

A two-region approach, informed by the life history of yellowedge grouper, was separated at the Mississippi River. One improvement from SEDAR 22 was fixing the hermaphroditism transition rate (first age male) rather than estimating it in the model based on histological studies of gonadal tissue. Similar life history information was used in SEDAR 85 and SEDAR 22. However, there were some slight changes to the alpha parameter for the weight-length relationship. For age and growth, stock assessment analysts did not retain the growth curves from SEDAR 22 and instead developed those curves based on the east/west delineation. Natural mortality was derived from catch curve analyses from as far back as the 1970s and appeared to be a good representation of the estimate. SEFSC staff re-evaluated the representativeness and reliability of sex-specific composition data; an approach used in SEDAR 22. Due to a number of identified issues, including small samples sizes and non-representative data, the determination was made to construct the SEDAR 85 model with both sexes combined. Yellowedge grouper are a long-lived species (maximum age 85 years) and age is arduous to assess as they get older resulting in more uncertainty in the ageing estimate. To address this issue, an ageing error matrix was developed for the stock assessment using data collected between 1977-2009 and 2013-2021.

SEDAR 85 used the Beverton-Holt recruitment relationship to model yellowedge grouper recruitment. This stock generally does not appear in the landings data until approximately 8 years of age. Steepness was not estimable, so a plausible approximation was derived from FishLife[1] resulting in a steepness value of 0.827. Sigma R was fixed at 0.5.

Recreational landings for yellowedge grouper only accounted for about 2% of the total removals over the total time series. An anomalous peak in recreational landings observed in 1982 was smoothed by averaging the landings collected between 1981-1985. Broadly, landings of yellowedge grouper were characterized as vertical line (commercial "other" gears, recreational

[1] https://github.com/James-Thorson-NOAA/FishLife

landings, and dead discards) and longline (commercial longline and dead discards) by region. To account for uncertainty, an approach of weighting by state landings was performed since yellowedge grouper are harvest throughout the Gulf of Mexico (Gulf). For age-composition, nominal composition was used due to concerns over assumptions and poor model fits, exclusions were made for fleet/year combinations with less than 10 otoliths collected, and otoliths collected from 2010-2012 were excluded since they were non-representative of landings. For fishery-independent survey length composition, composition was nominal, sample size was represented as number of fish, and information from the NFMS bottom longline was excluded pre-2000 due to gear changes in hook type. The same conditions were applied when assessing age composition from fishery-independent surveys. Additionally, data from the NMFS SEAMAP groundfish trawl survey from the eastern Gulf were excluded due to low samples sizes.

An SSC member asked whether there was any way to ascertain whether yellowedge grouper landed in a particular region were harvested within that region. He continued that most of the landings information come from the east but it's possible that vessels may take trips more than a week in duration and could fish in other parts of the Gulf while landing their catch in a different region. SEFSC staff replied that the majority of landings come from the region in which they were harvested and if that distinction is unknown from the logbooks, there are other locational information collected that can help assign those data fields. Additionally, positional data collected from Vessel Monitoring Systems, required in the reef fish commercial fishery since 2007, can also provide fishing location information.

An SSC member expressed concern about excluding commercial age samples collected during 2010-2012 and inquired if there was any way to account for that data gap. Dr. Sagarese replied that, up to 2009, the commercial age sampling design was informed from landing locations so they would be reflective of commercial harvest. For 2010-2012, there is no documentation on the sample design to collect those data, and when reviewing the fits for those years, they did not represent anything else collected during the time series. Starting in 2013, SEFSC staff began randomly assigning ageing data collection sites, so changes in sampling survey design have caused some concerns for constructing the model. Both the SSC and SEFSC staff acknowledge that better sampling documentation and changes in survey design need to be developed to avoid similar pitfalls in the future.

Dr. Sagarese reviewed ecosystem considerations for input in the model, including effects of red tide events and the Deepwater Horizon Oil spill. Yellowedge grouper did not exhibit the substantial drop in landings observed in other stock during unusually high red tide years. She postulated that red tide events could affect younger juveniles residing in more nearshore habitats, but to date, no detrimental stock-wide affects due to red tide have been observed. For the Deepwater Horizon Oil spill, the affects and potential mechanism for inclusion for the stock assessment is still unclear. An SSC member asked if there was still a market for yellowedge grouper since the oil spill. Dr. Jessica Stephen (Southeast Regional Office [SERO]) said yes that yellowedge grouper represent 80% of all Individual Fishing Quota (IFQ) deepwater grouper landings and also yielded the highest ex-vessel price in the Gulf.

The SSC discussed a moderate, but noticeable, rise in recreational landings in recent years. Several SSC members reported that recreational fishermen with larger vessels (more seaworthy,

improved fuel range) have begun targeting yellowedge grouper offshore. However, these vessels are more likely to launch from privately owned docks (too large to easily trailer and launch at some public boat ramps) where they will not be intercepted by dockside samplers. Given these factors, several SSC members contended that recreational landings of yellowedge grouper are likely underestimated and that a potentially substantial private recreational fishery may be emerging.

For the model results, a specialized version of a continuity run indicated that changes from SEDAR 22 to SEDAR 85 were within levels of expectations. A bridging analysis indicated that a few of the biggest changes between models included combining sexes, fixing the hermaphroditism rate, and treating the ageing data as nominal. The SEDAR 85 model was a lot different from what was constructed in SEDAR 22 but this was so improvements could be incorporated in the newest assessment. For the landings, the most uncertainty occurred in the earlier years (pre-1986) which lead to poorer fits. Tighter fits were observed from 2010 onwards. There were poor fits observed for the index of relative abundance. There was not a lot of contrast and the model predicted a relatively flat relationship over time. This result was similar to SEDAR 22, so in this instance despite more years of data input, there was not a marked improvement in capturing abundance estimates in SEDAR 85. There was some improvement in fitting the length and age composition from SEDAR 22. Occasionally the groundfish trawl survey would capture a larger yellowedge grouper and the model had difficulty accounting for these observations when fitting survey length data.

Recruitment fits represented a challenge for the model to fit since there is such little data to inform the stock-recruitment relationship, and both steepness and Sigma had to be fixed. The model results indicated the last few years (since 2005) have had low recruitment; however, there is not a good fishery-independent index of abundance for juvenile yellowedge grouper in the Gulf. Thus, the recruitment index is all model derived from fishery-dependence indices. An SSC member noted that since yellowedge grouper do not recruit to the fishery until about the ages of 8-9 years, any strong recruitment classes after 2012 will not materialize in the fisheries landings as of the assessment period. Therefore, the stock dynamics may not be as worrisome as they seem.

Results of model diagnostic and sensitivity analyses were also presented. A jitter analyses revealed no lower negative log-likelihood scenarios relative to the base model. Sensitivity runs indicated that was an influence of early uncertainty in the landings data. However, beginning the landings history in 1986 would eliminate contrast observed in the eastern region where the majority of the landings are harvested, so the entirety of the available landings data years was used. Excluding recreational data did not change any of the model outputs, so SEFSC recommended their continued inclusion.

An SSC member advocated for the removal of the recreational landings data form the model. He contended that yellowedge grouper represented a “rare event” species for the recreational sector and that the Office of Science and Technology who run MRIP-FES program have a history of extrapolating those types of data observations to unrealistically high landings estimates which affect management measures. Several SSC members replied that it appears the recreational interest in yellowedge grouper is growing, given the recent advancements in technology (e.g., mapping, spot-lock trolling motors). They also stated that the stock currently does not have a

sector allocation, so taking the recreational data out of the model was not address the issues brought up by the concerned SSC member. Another SSC member also advocated for leaving the recreational landings data in the model as that data represented valuable social information that should be incorporated when evaluating a fishery.

An SSC member expressed some concern about the health of the stock. The concerns were primarily based on the low recent estimates of recruitment and the NMFS bottom longline survey trending downward. Overall, the SSC determined that the stock assessment model presented was appropriate for generating catch advice.

Motion: The SSC accepts the SEDAR 85 Gulf of Mexico yellowedge grouper assessment as consistent with the best scientific information available.

Motion carried with no opposition.

Presentation of the Fishermen Feedback Tool for Yellowedge Grouper

Council staff analyzed 63 responses received from September 15 – October 12, 2023. The majority of responses indicated an overall neutral sentiment followed in frequency, by a negative sentiment. Relative to stock condition, only 34 responses were analyzed as those comments included some information regarding abundance. The results for this subgroup of comments indicated a split between positive and negative sentiment. There was some misalignment in sentiments between the private recreational being more neutral and the commercial sector being more negative. Council staff speculated this was perhaps due to the yellowedge grouper being a deepwater species where recreational anglers may be newer to this fishery and thus have a different historical baseline than commercial anglers that have prosecuted this fishery for decades. Council staff also noted, that for the first time in several recent iterations of the tool, the word "shark" was not the most used negative word across all comments.

An SSC member suggested that assessing comments containing both negative and positive sentiment as a neutral comment was less than optimal. He recommended breaking up those comments into sentiment categories for subsequent analysis. Another SSC member asked if 63 responses represented a normal sample size for the tool and Council staff replied that the yellowedge grouper version of the tool received a moderate number of commenters. An SSC member inquired if the commercial industry had a relatively higher negative sentiment because respondents had a longer history with the fishery. Council staff answered that they are bound by the Paperwork Reduction Act, so asking pointed questions about fishing history is difficult. They did state that future reports of the tool could include parsing of the data by sector, location, and sentiment.

Discussion on the Conditions for Yellowedge Grouper Model Projections

The SSC re-evaluated the current Maximum Sustainable Yield (MSY) proxy of the fishing yield at 30% spawning potential ratio ($30\%_{SPR}$) for yellowedge grouper. Several SSC members argued for the merits of a more conservative proxy. The rationale included the long-life span of yellowedge grouper and the late age of male transition (about 40 years). The SSC reviewed its recent previous

discussions to change the MSY proxy for other grouper species including gag (F_{MAX} to 40%$_{SPR}$) and scamp (30% $_{SPR}$ to 40%$_{SPR}$). Given that yellowedge grouper is long-lived (max 85 years), and the high level of recruitment uncertainty, particular in the recent time series, as well as the complex life history of the species, the SSC determined that projections using a 40% spawning potential ratio (40%$_{SPR}$) MSY proxy was appropriate.

Motion: The SSC recommends an MSY proxy of the yield at $F_{40\%spr}$ for yellowedge grouper.

Motion carried with no opposition.

The SSC then discussed what years from the recruitment time series would be most appropriate to inform the projection analysis. An SSC member argued against using the entire time series as uncertainty is higher in earlier years. The SSC expressed a desire to capture some of the recent contrast in recruitment by including years of estimated higher recruitment with those years of estimated lower later in the time series. An SSC member noted that there are notable differences between the east and west regions from the bottom longline landings data creating a net positive relationship in newly recruited ages. Potentially the model maybe underestimating recruitment, so providing a contrast in recruitment years to inform the projections is important when developing catch advice.

Motion: The SSC recommends to set the period for estimating mean recruitment for the purpose of constructing projections for yellowedge grouper as the 15-year period from 1998-2012.

Motion carried with no opposition.

Review of Other Deepwater Grouper Landings Data and Catch Limits

Council staff presented the landings for the species within the deep-water grouper complex to discuss if these species should continue to be managed as a group. Within the complex, the majority of landings come from yellowedge grouper, which is the only species within the group with a completed stock assessment.

An SSC member noted the declining trend in landings for the deepwater grouper complex. The group also acknowledged that catch recommendations should incorporate the amount of data uncertainty. The potential use of yellowedge grouper as an indicator species was discussed. Council staff noted that an indicator species for the complex could result in potential implications for calculating and distributing commercial IFQ shares. The SSC discussed if Tier 3a or Tier 3b in the Acceptable Biological Catch (ABC) Control Rule would be more appropriate given the declining trend in the landings data

Some SSC members were concerned about taking a conservative approach, given that there would not be much room for increasing harvest. However, the SSC determined that the declining trend in recent landings, uncertainty in the data, and the life history of the deepwater grouper species, it was appropriate to set the OFL and ABC using Tier 3b in the ABC Control Rule.

Motion: The SSC recommends that the OFL (244,035 lbs gw) for snowy, warsaw and speckled hind be based on tier 3b of the control rule and the time series be between 2010-2022 and that the ABC (183,026 lbs gw) be 75% of the OFL.

Motion carried 21-1 with 2 abstentions.

Review of SEDAR 85: Gulf of Mexico Yellowedge Grouper Projections

Dr. Sagarese presented the results of a projection analysis generating the Overfishing Limit (OFL) and ABC for yellowedge grouper using the MSY proxy and recruitment years stipulated by the SSC. By modifying the MSY proxy to the yield at $40\%_{SPR}$ the stock is not considered overfished but is undergoing overfishing. The SSC determined that using a 5-year average to calculate constant catch limits was appropriate since no other stock assessment for yellowedge grouper is expected to be conducted in the near future. Since several deepwater grouper species inhabit similar environments, the SSC acknowledged the difficulty fishermen would have of attempting to avoid catching yellowedge grouper when targeting other deepwater grouper species. Therefore, the SSC also recommended keeping yellowedge within the deepwater grouper complex. Since yellowedge grouper has a stock assessment catch advice informed by SEDAR 85 will added to the OFL and ABC (calculated using Tier 3b of the ABC Control Rule) for the rest of the deepwater grouper complex. This determination maintains the current management structure for the complex.

Motion: For GOM yellowedge grouper, the SSC recommends the OFL based on 5 years (2025-2029) of 487,000 lb gw and an ABC of 372,000 lb gw.

Motion carried 20 to 2 with 1 abstention and 1 absent.

Meeting Participants

Standing SSC
Luiz Barbieri, *Vice Chair*
Harry Blanchet
David Chagaris
Roy Crabtree
Doug Gregory
David Griffith
Paul Mickle
Trevor Moncrief
Jim Nance, *Chair*
Will Patterson
Dan Petrolia
Sean Powers
Steven Scyphers
Jim Tolan

Special Socioeconomic SSC
Luke Fairbanks
Cindy Grace-McCaskey
Jack Issacs

Council Representative
Billy Broussard

Special Ecosystem SSC
Mandy Karnauskas
Josh Kilborn
Steven Saul

Special Reef Fish SSC
Jason Adriance
Mike Allen
John Mareska

A list of all meeting participants can be viewed here.