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

Review of SEDAR 68: Gulf of Mexico Scamp and Yellowmouth Grouper
Meeting Summary
September 21 – 23, 2022

Review: SEDAR 68 Operational Assessment for Gulf of Mexico Scamp and Yellowmouth Grouper

Dr. Katie Siegfried (SEFSC) presented the findings of the SEDAR 68 Operational Assessment (OA) of Gulf of Mexico Scamp and Yellowmouth Grouper. SEDAR 68 began in 2020 with a research track (RT) to build the modeling environment for this stock assessment, as it is a first for scamp in the Gulf. Scamp is currently considered part of the shallow-water grouper complex (along with black grouper, yellowfin grouper, and yellowmouth grouper). Also, commercial harvest of scamp is regulated under an individual fishing quota (IFQ) program such that when a shareholder of commercial shallow-water grouper allocation has landed that allocation for the year, they can still land scamp on any remaining deep-water grouper allocation.

Dr. Siegfried reviewed the management history for scamp, and noted that the assessment also includes yellowmouth grouper due to difficulties in differentiating between the species when identifying them dockside. The stock structure was unchanged from the current management structure, as no data supported an alternative. One of the tasks of the OA was to re-estimate age data using updated growth curves and age composition data. Approximately 500 otoliths from 2003 - 2012 were reprocessed, and added to additional samples from 2018 – 2020. These data were then input for placeholder data from the RT and the ageing error matrix was reconstructed. Coefficients of variation for growth parameters were allowed to be model-estimated, and resulted in an updated growth curve. Natural mortality was estimated internally using the Lorenzen approach and, with a reference age of 10 years, was equal to 0.17. This estimate accounts for an assumption of peak spawning occurring in mid-April.

Dr. Siegfried summarized the data updated in the model, which uses a terminal data year of 2020. Abundance indices were informed by the commercial vertical line and headboat fleets, and from the fishery-independent combined video surveys. Landings and discards were input by fleet, with the private angling and charter for-hire fleets combined. Age and length composition data were available for all fleets, and length composition data only for the video surveys. Corrections were made in the OA for the omission of area 23 off the Florida/Alabama line in the headboat landings, as was also done recently for gag grouper (SEDAR 72). Landings are generally dominated by the commercial fleets (mostly vertical line), but recreational landings have increased considerably recently. Recreational landings are input as numbers of fish. Recreational discards are estimated to be substantially greater than commercial discards. This was maintained for the OA, along with mean weight estimated by fleet (headboat and charter/private); generally, the charter/private fleet lands larger fish than the headboat fleet. The commercial fleets land larger fish on average when compared to the recreational fleets. Discard mortality rates of 47% for commercial longline, 68% for commercial vertical line, and 26% for the recreational fleets were applied to discards. Most

recreational discards are commensurate with the minimum size limit, while commercial discards after 2010 (when the IFQ program was implemented) can be either above or below the minimum size limit, likely due to the availability of allocation on a trip. Indices of relative abundance indicate a decline in recent years, especially in the Reef Fish Observer Program (RFOP) data.

Dr. Siegfried noted that the base model in the OA uses a spawning stock biomass (SSB) estimate considerate of both males and females, and updated the mean weight estimated for recreational landings. Changes in the growth curve estimation resulted in larger changes, resulting in an increase in terminal year SSB. Additional model improvements had minimal impacts on terminal year outputs but resulted in more stable model performance. Hindcasting ability was improved, with Mohn's Rho estimating within bounds in the OA base model for SSB and fishing mortality (F). Growth is estimated by the model, and time-varying retention is used to account for changes in fisheries management with time. Dr. Siegfried pointed out that scamp is not assumed to be in a virgin exploited condition at the beginning of the time series in 1986, necessitating estimation of initial F conditions for all fleets except headboat (which used the average of 1986 – 1990). Large errors on recreational landings (CV = 0.3) are assumed; commercial CVs are constrained to 0.05 up to 2009, and 0.01 post-2009. Catchability is held constant, as the manner in which harvest has occurred has been consistent. Ages were modeled from 1 – 34 years, with fish 20 years and older lumped into a "plus" group (20+; <4% of ages). For estimating the stock-recruitment relationship, recruitment deviations were estimated from 1986 – 2017. Steepness was not able to be estimated freely in the model, and was fixed at 0.69 based on empirical data and from the steepness estimate for South Atlantic scamp. Length-based selectivity was used for all fleets and surveys, with logistic functions applied to commercial fleets and the SEAMAP combined video survey, and dome-shaped functions applied to the recreational fleets. Selectivity was held constant, and retention was time-varying using time blocks based on regulatory changes. All fish caught prior to the implementation of minimum size limits were assumed retained, as are all commercially harvested fish post-2009. Recreational retention is assumed asymptotic (and estimated within the model), since daily bag limits keep all fish from being retained.

Dr. Siegfried walked the SSC through the model results, which estimate selection and retention of larger and older scamp by the commercial fleets compared to the recreational fleets and the video indices. Fits to commercial landings were good, and fair for recreational landings in most years. Fits to discards were generally within confidence intervals (CI) for all fleets, but highly variable. Commercial discards decreased substantially post-2009. Some patterning of mis-fitting was evident in the residuals for the length and age composition data from the commercial fleets, but the residuals were nonetheless small. Patterns in residuals were evident in the recreational sector as well, to a lesser degree; however, residuals were larger compared to commercial data. Dr. Siegfried noted that scamp is rarely directly targeted except by the headboat fleet, and as such the residuals observed may be affecting the data for scamp based on what species are being targeted. Fits to length compositions were improved, albeit at the expense of the age compositions to some degree. Fits to indices were within CIs in most years for all indices, with the best fit being to the headboat index; the model appears to be largely ignoring the RFOP index. The stock-recruitment relationship is poorly defined, and recruitment deviations are generally lower for the last decade. Females (average age 2-3 years) are more prevalent than males (average age 10-13 years), and the proportion of males in the SSB has increased in recent years. Fishing mortality is dominated by the commercial fleets historically, and the charter-private fleet in recent years.

Dr. Siegfried described the model diagnostics, noting that very few model parameters are fixed, which results in some movement of model results in jitter analyses. Fixing parameters would reduce model movement, but would mask uncertainty. Likelihood profiling supported the OA base model estimate for virgin recruitment, initial Fs, and length-at-age, with less certainty in the recruitment and growth parameters. Retrospective bias fell within acceptable thresholds; however, bias was highest for estimates of F. Non-random patterns in residuals were evident in the commercial vertical line and recreational data, and poor predictive skill observed for the SEAMAP combined video surveys and the RFOP. A jackknife analysis, removing indices to test model sensitivity, showed a sensitivity to the headboat data and all fishery-independent indices for SSB.

Dr. Siegfried reviewed the estimated benchmarks and projections. The minimum stock size threshold (MSST) was set at 75% of biomass at maximum sustainable yield (B_{MSY}), and F_{MSY} at a 30% spawning potential ratio ($F_{30\%SPR}$). Relative Fs used the average of Fs for 2018 – 2020, as did retention and selectivity, respectively. Recruitment was informed by the Beverton-Holt stock-recruitment relationship. Interim landings used actual landings for 2021, and the average of 2019 – 2021 for 2022. Since scamp does not have a sector allocation, no allocation is assumed in the projections. As of 2020, scamp is not overfished (SSB_{2020}/MSST = 2.15; a value greater than 1 is good), and is not experiencing overfishing ($F_{Current}$/MFMT = 0.538; a value less than 1 is good). The SSC noted that optimum yield is a yield in pounds, not a rate of exploitation. Thus, OY should be defined as the yield at 90% of F_{MSY}, or 90% of $F_{30\%SPR}$. Because the current SSB is greater than SSB_{MSY}, the yield resulting from fishing at 75% of $F_{30\%SPR}$ would result in an OY greater than 90% of SSB_{MSY}. OY is a long-term equilibrium value, and is intended to be equivalent to a level of fishing that is below F_{MSY}.

The SSC was encouraged to think about the dynamics of how scamp and yellowmouth grouper are currently managed within the shallow-water grouper complex. Further, the OFL projections for this OA are calibrated to the MRIP-FES, while the black and yellowfin grouper portions of the current shallow-water grouper ACL are currently in MRIP's Coastal Household Telephone Survey data currency. Dr. Siegfried also asked about the projection settings, specifically for recruitment and using model-derived values for 2018 – 2020 that may be overly optimistic. An SSC member noted that the stock has been trending down towards SSB_{MSY} in recent years, while F has been decreasing at the same time. The SSC thought it best to use the stock-recruitment relationship for determining the benchmarks, but a more recent period for the projections. SSC members discussed the merits of using the last 10 years of estimated recruitment, considerate of recent management changes that may reduce direct targeting of shallow-water groupers in the near-term.

The SSC also discussed the F_{MSY} proxy of $F_{30\%SPR}$, and whether $F_{40\%SPR}$ should also be considered, as was done recently for gag. Of note was the lower susceptibility of scamp to red tide, as scamp is usually found on the shelf edge and less affected by red tide blooms. Also noted was the seemingly lower overall productivity of the stock, especially since scamp is not directly targeted as widely as gag and red grouper, and that scamp do not typically grow as large as gag and red grouper. Under Amendment 48 to the Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico (RF48), the Council can specify the adoption of a new proxy for status determination criteria (like F_{MSY}) within an amendment without it being a separate action. Thus, the SSC could investigate $F_{40\%SPR}$ if it thought that appropriate for scamp, and make such a

recommendation to the Council. Dr. Siegfried added that specifying recruitment for the projections was critical for estimating benchmarks and generating projections under $F_{40\%SPR}$.

Many SSC members thought that similar management strategies should be considered for other grouper species, including F_{MSY} proxies. Some SSC members were more reserved, wanting to consider the life history of scamp and yellowmouth grouper more directly before proposing any modification to the current F_{MSY} proxy. The SSC was reminded of presentations provided at past SSC meetings about applying higher F_{MSY} proxies like $F_{40\%SPR}$ and $F_{50\%SPR}$ for grouper species based on contemporary research. Some SSC members thought the SSC should have a more directed and public discussion of the global application of $F_{40\%SPR}$ to grouper species in general before adopting that F_{MSY} proxy for additional stocks. Other SSC members disagreed with a global application, but rather considered the similarities between scamp and gag (e.g., low recent recruitment, recent recruitment trends, low proportion of males, similar habitat requirements, and aggregate spawning of protogynous hermaphrodites). The SSC decided to consider the current analytical product for the OA before considering an alternative to the current F_{MSY} proxy.

> **<u>Motion</u>: The SSC moves to accept the SEDAR 68 Gulf of Mexico Scamp Operational Assessment as consistent with the best scientific information available. Under the current F_{MSY} proxy of $F_{30\%SPR}$, the model derived estimates indicate that the stock is not overfished and is not undergoing overfishing.**
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> *Motion carried without opposition*.

Dr. Siegfried presented updated scamp projections using $F_{40\%SPR}$, which also indicate that the stock is not overfished (SSB_{2020}/MSST = 1.41; a value greater than 1 is good), and is not experiencing overfishing ($F_{Current}$/MFMT = 0.786; a value less than 1 is good) as of 2020. Under $F_{40\%SPR}$, catch yields increase with time as the stock increases from an SSB level between MSST and SSB_{MSY} ($SSB_{40\%SPR}$) to $SSB_{40\%SPR}$. When projecting based on a model-estimated MSY, MSY is estimated equivalent to an SPR of 37.8%. The corresponding OFL projections based on $F_{30\%SPR}$ and $F_{40\%SPR}$ are shown in Tables 1 and 2.

Table 1. OFL projections for scamp assuming an F_{MSY} proxy of $F_{30\%SPR}$, beginning in 2023.

Year	Recr	F	F/ FSPR30	SSB	SSB/ SSBSPR30	SSB/ MSST	SSB ratio	OFL	OY
2023	1191	0.171	1	1069	1.33	1.77	0.28	0.426896	0.384206
2024	1176	0.171	1	1026	1.27	1.70	0.27	0.409010	0.368109
2025	1165	0.171	1	994	1.23	1.65	0.26	0.395361	0.355825
2026	1155	0.171	1	970	1.20	1.61	0.26	0.384984	0.346485
2027	1147	0.171	1	950	1.18	1.57	0.25	0.376632	0.338969
2028	1140	0.171	1	933	1.16	1.54	0.25	0.369710	0.332739

Table 2. OFL projections for scamp assuming an F_{MSY} proxy of $F_{40\%SPR}$, beginning in 2023.

Year	Recr	F	F/ FSPR40	SSB	SSB/ SSBSPR40	SSB/ MSST	SSB ratio	OFL	OY
2023	1192	0.117	1	1069	0.87	1.16	0.28	0.292801	0.263521
2024	1196	0.117	1	1081	0.88	1.17	0.29	0.295341	0.265807

2025	1201	0.117	1	1096	0.89	1.19	0.29	0.298084	0.268275
2026	1205	0.117	1	1109	0.90	1.20	0.29	0.300698	0.270628
2027	1209	0.117	1	1121	0.91	1.21	0.30	0.303425	0.273083
2028	1212	0.117	1	1131	0.92	1.23	0.30	0.306100	0.275490

The SSC requested a review of consideration of F_{MSY} proxies at a future meeting. The SSC discussed next steps for scamp, including determining an ABC for scamp. Council staff noted that the SSC should seek the Council's input regarding its intent for how scamp should be managed, since it and yellowmouth grouper are currently included in the shallow-water grouper complex which is part of the Grouper-Tilefish IFQ program. If scamp and yellowmouth remain part of the shallow-water grouper complex, then projections would need to be provided including all four species in that complex. If not, then projections would need to be provided for scamp and yellowmouth, and also for black grouper and yellowfin grouper. The SSC decided to defer ABC projections until such a time that it receives advice from the Council on how future management might be envisioned. The SSC thought its consideration of scientific uncertainty for decrementing the ABC from the OFL would be strongly contingent on whether scamp and yellowmouth grouper remain in, or are managed separate from, black grouper and yellowfin grouper.

> **<u>Motion</u>: The SSC accepted the SEDAR 68 Gulf of Mexico Scamp and Yellowmouth Grouper Operational Assessment as consistent with the best scientific information available. However, the SSC thinks that an F_{MSY} proxy of $F_{40\%SPR}$ is more appropriate for scamp and yellowmouth grouper, based on their life history, and thus should be considered by the Council for management. Under an F_{MSY} proxy of $F_{40\%SPR}$, the model derived estimates indicate that the stock is not overfished and is not undergoing overfishing.**
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> *Motion carried with one in opposition*.

Scamp and Yellowmouth Grouper Updated Projections within the Shallow-water Grouper Complex (March 7 – 9, 2023)

Dr. Skyler Sagarese (SEFSC) presented updated projections for the Council's shallow-water grouper complex, which includes scamp, yellowmouth grouper, black grouper, and yellowfin grouper. Scamp and yellowmouth grouper were recently assessed in SEDAR 68, which examined both species together as a complex, and found these species to be healthy. The Council did not express interest in creating a new individual fishing quota (IFQ) program share category for scamp and yellowmouth grouper; therefore, the SEFSC was requested to update the projections for the entire shallow-water grouper complex, which necessitated calibrating historical landings for black grouper and yellowfin grouper to the Marine Recreational Information Program's Fishing Effort Survey (MRIP-FES) data units, to match the data units with those used for scamp and yellowmouth grouper in SEDAR 68. The species in the shallow-water grouper complex do not use sector allocations.

Dr Sagarese reviewed a decision by the SSC in September 2022, to use the mean recruitment over the last 10 years for which recruitment data were available (2008 – 2017. The SEDAR 68 OA

base model did not estimate recruitment deviations through the terminal year (2020); it stopped in 2017 due to a lag in encountering scamp in the requisite data sets. For 2018 – 2020, the model predicted recruitment estimates from the spawner-recruit curve (~1.2 million scamp in each year) based on the Beverton-Holt stock recruit relationship. When projecting with recent mean recruitment (2018 – 2020), the model did not converge; thus, those recruitment estimates were replaced with the recent mean, which was much lower. Dr. Sagarese noted that for the OFL projection, the model was modified to estimate recruitment deviations through 2020 to enable projections, with the 2019 and 2020 estimates of recruitment remaining highly uncertain.

Dr. Sagarese reviewed updated projection settings for scamp and yellowmouth grouper. The projections assume the recent mean recruitment, where the MSY proxy equals the yield when fishing at 40% SPR ($F_{40\%SPR}$), and OY equals 0.9 * MSY proxy (i.e., $F_{40\%SPR}$). Dr. Sagarese showed that the lower recruitment setting translates to lower SSB and stock status ratios. Council staff asked why the projections appeared to show that the stock was being fished down to MSST, as opposed to $SSB_{40\%SPR}$. Dr. Sagarese replied that if the projection was carried forward beyond the typical 5 years, that the stock would be fished to a lower biomass level corresponding to the lower estimate of recruitment. However, these projections aren't meant to be viewed in the context of achieving equilibrium, but rather that recruitment is not expected to be as optimistic as the model-derived values from the base model in the short term. The long-term projections would still be based on the long-term average recruitment, and not the 10-year average used for these projections.

Alternative projections for scamp and yellowmouth grouper were shown, with a version beginning in 2024, and assuming landings in 2023 will be the same as those from 2022, which were based on the average from 2019 – 2021. Another correction was shown, correcting a discrepancy with the 2021 charter/private recreational landings. Those landings were reduced from 96,068 to 83,595 fish (data correction for charter in West Florida in all waves of 2021), which also updated the 2019-2021 average landings (this average also informs 2022 and 2023). A projection for ABC was also provided assuming the ABC would be set equal to 75% of the yield at $F_{40\%SPR}$. Dr. Sagarese said that this was just one way in which the ABC could be addressed.

An SSC member commented on how the recent landings show a decrease over the last 10 years, and noted that the stock may be responding to fishing pressure. Another SSC member asked which fishery-independent index was primarily informing the model. Dr. Sagarese replied that the combined video index was the only fishery-independent index informing the model.

The SSC discussed options for how to set the OFL and ABC, while retaining all four shallow-water grouper species within the shallow-water grouper complex. SSC members discussed some of the difficulties with breaking scamp and yellowmouth grouper out in the context of the commercial IFQ program. One option discussed was to use the projections for scamp and yellowmouth grouper from SEDAR 68, and use a reference period to inform the catch limits for black grouper and yellowfin grouper. An SSC member noted an allowance for landing scamp specifically under both the shallow-water grouper and deep-water grouper complexes within the Grouper-Tilefish IFQ program. Another alternative discussed was to revise the scamp and yellowmouth grouper portion of the shallow-water grouper complex, without updating the black grouper and yellowfin grouper catch limits, and then adding the four species together. However,

this method would require re-examining the black grouper and yellowfin grouper landings in MRIP-FES to make them comparable to the data units in SEDAR 68. The SSC would need to select a reference period to inform catch for black grouper and yellowfin grouper. An issue with summing the results of SEDAR 68 with a Tier 3a approach for black grouper and yellowfin grouper is that if harvest of scamp and yellowmouth grouper exceed the OFL projections from SEDAR 68, overfishing of those species within that year would be estimated to have occurred. This is particularly an issue with the IFQ program, as once allocation is released to shareholders, it cannot be recalled. Another alternative is a proportional approach based on the fraction of landings attributable to each species; however, this approach yields catch limits which infer that black grouper and yellowfin grouper are in a similar stock condition as scamp and yellowmouth grouper, which cannot presently be verified.

The SSC thought it was most appropriate to address the results of SEDAR 68, and provide an OFL and ABC to the Council for scamp and yellowmouth grouper. The SSC could then discuss how to address black grouper and yellowfin grouper at a subsequent meeting. Some SSC members expressed concern about not providing combined OFLs and ABCs for the shallow-water grouper complex as a whole, since that is how the included species are presently managed. Another SSC member discussed the merits of acknowledging the results of the SEDAR 68 projections in the context of the application of the ABC Control Rule, but not yet setting the catch limits for shallow-water grouper as a whole complex.

> **Motion**: **The SSC moves to accept the updated projections for the SEDAR 68 Gulf of Mexico Scamp and Yellowmouth OA. Accordingly, the SSC recommends that catch level recommendations for OFL and ABC for the period 2024-2026 be set as the yield (million pounds gutted weight; mp gw) at $F_{40\%SPR}$ and ABC as the yield (mp gw) at $0.75*F_{40\%SPR}$.**

Year	OFL (mp gw)	ABC (mp gw)
2024	0.271	0.203
2025	0.263	0.203
2026	0.257	0.203

> *Motion carried 19 – 2, with 3 absent.*

The SSC determined that it would need recreational and commercial catch for black grouper and yellowfin grouper, dating back to 1986, with recreational catch in MRIP-FES data units. These data would then be considered under Tier 3a for establishing an OFL and ABC. For discussion, reference periods reflective of those considered in the Generic ACL/AM Amendment, and for the last 10 years (2012 – 2021), could be provided. An SSC member suggested that new SSC members review past discussions of the data used in the Generic ACL/AM Amendment prior to the next SSC meeting in May 2023.

Meeting Participants

Standing SSC
Jim Nance, *Chair*
Luiz Barbieri, *Vice Chair*
Harry Blanchet

David Chagaris
Roy Crabtree
Benny Gallaway
Doug Gregory
David Griffith
Paul Mickle
Will Patterson
Sean Powers
Steven Scyphers
Jim Tolan
Richard Woodward

Special Reef Fish SSC
Jason Adriance
Mike Allen
John Mareska

Special Ecosystem SSC
Mandy Karnauskas
Josh Kilborn
Steven Saul

Special Socioeconomic SSC
Luke Fairbanks
Cindy Grace-McCaskey
Jack Isaacs

Council Representative
Tom Frazer

A list of all meeting participants can be viewed here.