

## **Standing, Reef Fish, Socioeconomic, and Ecosystem SSC Meeting Summary January 10 – 12, 2022**

The meeting of the Gulf of Mexico (Gulf) Fishery Management Council's (Council) Standing, Reef Fish, Socioeconomic, and Ecosystem Scientific and Statistical Committees (SSC) was convened at 8:30 AM EDT on January 10, 2023. The agenda for this meeting was approved along with the minutes from the September 2022 SSC meeting. [Verbatim minutes from past SSC meetings can be reviewed here.](#)

Dr. Jim Nance will represent the SSC at the Council's January 30 – February 2, 2023, meeting in Baton Rouge, Louisiana.

### *Review of SEDAR 75: Gulf of Mexico Gray Snapper*

Dr. Francesca Forrestal (Southeast Fisheries Science Center [SEFSC]) presented the SEDAR 75 Operational Assessment of Gulf of Mexico Gray Snapper<sup>1</sup>. SEDAR 75 resolved several concerns from the previous model (SEDAR 51 2018<sup>2</sup>), and incorporated updated recreational landings data calibrated to the Marine Recreational Information Program's Fishing Effort Survey (MRIP-FES). Dr. Forrestal reviewed the model's construction and development, included indices of relative abundance, base model estimations and results, diagnostics, and yield projections based on the Council's currently defined status determination criteria. SEDAR 75 uses data through 2020.

### *Model Construction and Development*

Dr. Forrestal reviewed the data used in the model, which include catch and effort from the directed fleets (commercial longline, commercial vertical line, commercial nets and traps, recreational shore, recreational private vessel, and charter for-hire and headboats combined), with all of Monroe County in Florida included in the Gulf. The estimates of natural mortality, maximum age (28), and sex ratio (50:50) were unchanged from SEDAR 51. The ratio of fecundity to length was updated with additional samples, with functional maturity estimated at 2.5 years and 269.8 mm fork length (FL); 90% of individuals are estimated to be sexually mature by 5 years and 358.8 mm FL. These estimates are slightly greater than the physiological maturity, but better represent what is thought to be effectual maturity for this species within the stock. Shore mode landings were examined in a topical working group (TWG) to address concerns about the magnitude of estimated landings and discards in 1984, and other issues. Eliminating 1984 was considered but avoided; instead, the year was smoothed using the 1986 stratum since a geometric mean approach was not possible due to a lack of data in that stratum from the preceding years.

SEDAR 75 no longer uses the regional fleet stratification used in SEDAR 51, but keeps all fleets separate except for the for-hire fleets. For abundance indices, the commercial vertical line fleet for the pre-individual fishing quota period (pre-2010) was excluded, and the updated combined video

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<sup>1</sup> <https://sedarweb.org/documents/sedar-75-gulf-of-mexico-gray-snapper-final-stock-assessment-report/>

<sup>2</sup> <https://sedarweb.org/documents/sedar-51-gulf-of-mexico-gray-snapper-final-stock-assessment-report/>

survey was added. All other indices were updated through 2020. Length composition of retained catch was updated, and age compositions were included along with length compositions from fishery-independent surveys. Meristic relationships between age, length, and weight were all updated with new model estimates. The treatment of the commercial fleet structure in SEDAR 51 led to an error in the total landings, which was corrected in SEDAR 75. Recreational landings still make up the majority of total landings (greater than 90% in recent years), with most of those recreational landings coming from the recreational private vessel mode. Calibrating the recreational data to MRIP-FES resulted in approximately a 2.3x increase in landings from the former MRIP Coastal Household Telephone Survey (CHTS), and also an increase in the estimate of recreational shore landings in recent years. An SSC member noted that the high point estimate of over 22 million recreational discards appeared to be driven by wave 1 (January and February) estimated from Florida in 2020 (about 6 million fish), which appeared larger than any other estimate from wave 1 in the time series. Dr. Forrestal noted that she would look into those data.

Commercial discards are estimated to be quite low, due in part to commercial fishing behavior and no commercial trip limits. Recreational discards are estimated to comprise a large proportion of recreational catch (approximately 80% for private vessels, 90% for shore, and 60% for for-hire vessels in 2020). Commercial discard mortality was estimated at 6.9%, and recreational discard mortality at 14%. An SSC member asked whether the estimate of a 90% discard fraction for the shore mode was reasonable. Others replied that there is considerable fishing effort on bridges, jetties, rivers, freshwater springs, and piers which all hold a large number of gray snapper that are at or near the Florida state waters minimum size limit (10 inches total length). Combined with a state-waters 5-fish recreational bag limit, this may be driving this point estimate for high discards. An SSC member asked about the discard mortality rates, and why they were seemingly lower than for other species. Council staff replied that much of the fishing activity for gray snapper occurs in waters less than 20 meters in depth; combined with generous minimum size limits and recreational bag limits, and no commercial trip limits, and the requirement to use circle hooks which decreases terminal hooking injuries, and the resultant discard mortality rates for this species should be comparatively lower. Another SSC member added that the shore mode did not account for private access point discards, which may be lower. Dr. Katie Siegfried (SEFSC) asked whether the estimate then represented a floor for the shore mode landings. Dr. Siegfried added that there was also an issue about repeated discarding, especially in the shore mode, which may affect the point estimate for those discards and possibly the corresponding discard mortality rate. The SSC noted that data to better inform the shore mode landings with respect to differences in catch per unit effort between public and private access points were not available.

Dr. Forrestal reviewed the indices of relative abundance. Fishery-dependent indices include the directed fleets with the exception of the commercial vertical line as previously noted, with Stephens and MacCall associated catch estimation used to identify gray snapper target trips. Fishery-independent indices include the Fish and Wildlife Research Institute's (FWRI) age-0 and age-1 surveys in four regions along west Florida, which were used as a recruitment index, and indicate an increase in recruitment in recent years. An SSC member asked whether there could be a climate change effect involved in those indices; Dr. Forrestal said such an effect was not investigated but could be a research recommendation. Another SSC member noted the sawtooth pattern in the age-0 index, which could represent a density dependent effect; however, an SSC member added that other density independent environmental effects could also be at play, given

gray snapper's propensity for inhabiting euryhaline environments at juvenile stages. The SEAMAP trawl survey was used for 2010 – 2020, included length composition data, and showed a consistent trend over that period with a sharp increase in 2020. The combined video index captured larger fish than the SEAMAP survey, and is increasing over time. The Reef Fish Visual Census has several data gaps since 2013, and captures fish similar in size to the SEAMAP trawl.

Dr. Forrestal reviewed the progression of the model's development from the SEDAR 51 base model, to the base model presented for SEDAR 75. All ages above 21 were combined into a plus group (21+). Main recruitment deviations were estimated from 1981 – 2020, with time-varying retention to account for changes in size limit regulations. Dirichlet multinomial likelihood was used for analyzing composition data. Dome-shaped selectivity is modeled for all directed fleets and fishery-independent surveys, except for the combined video index, which used a logistic function. Age selectivities were estimated with loose symmetric beta priors. A continuous F method was used since catch is not precisely known. Fishery-dependent indices used a coefficient of variance (CV) of 0.2; commercial indices, 0.05; and recreational indices, 0.1. Time-varying retention was modeled to account for changes in management regulations over time, with all fish caught before size limits assumed to be retained. Full retention above federal size limit is assumed for the commercial fleets, and above the Florida minimum size limit for the recreational fleets.

#### *Assessment Model Results*

Dr. Forrestal discussed the results from the proposed base model, beginning with estimates of landings from the directed fleets. Recreational landings comprise the bulk of total landings, and follow an increasing trend over the time series. Fits to commercial discards are underestimated in the early part of the time series; however, commercial discards are thought to be very low. Recreational discards are underestimated by the model in many years for all modes, with recreational discards increasing with time. Predictably, the commercial longline fleet tends to select for larger, older fish than the commercial vertical line and recreational for-hire fleets, which do the same compared to the recreational private vessel fleet, followed by the smallest and youngest fish being selected by the recreational shore mode. Retention is knife-edged at the minimum size limit. The base model is modestly underestimating retention of younger ages from the directed recreational fleets compared to observed data. A tradeoff for the model is apparent between ages and lengths, in that there are fewer years of data available if using both ages and lengths for composition data in a year. Some residual patterning is seen in the combined video survey, which shows more larger fish in the early part of the time series compared to the more recent portion (pre- versus post-2014). The model is putting the least emphasis on length composition data from the commercial nets and traps fleet and the Reef Fish Visual Census, and the highest on the length and age composition data from the commercial longline fleet and the length composition from the recreational shore mode.

Dr. Forrestal showed the model fits to indices of relative abundance, which show fits that follow trends well for most surveys except the FWRI age-0 and age-1 surveys. Recruitment is estimated to be increasing over time, with a decrease in the last 2 years. Steepness is fixed at 0.99, indicating a poor stock-recruitment relationship. The initial and present stock size is thought to have been larger than estimated by SEDAR 51. The model is also estimating a larger number of younger fish than SEDAR 51. An SSC member asked about the estimated fleet retention for the early part of

the time series from SEDAR 51. Dr. Forrestal replied that discussions with fishermen determined that it was unlikely that fishermen would have kept smaller fish following the institution of the minimum size limit; thus, this estimation of retention was corrected in SEDAR 75. The SSC member also asked about the decline in selectivity of larger fish in the Reef Fish Visual Census. Dr. Forrestal replied that the Reef Fish Visual Census surveys up to a depth limited by recreational divers around the inner reef, which would result in the survey not seeing larger, older fish.

### *Diagnostics*

Dr. Forrestal reviewed the jitter analysis, which showed model stability with the variation of model parameters by up to 10%. Likelihood profiling showed some instability with commercial nets and traps data, which informs the model the least. No directional retrospective patterns are observed. Non-random patterns in residuals are observed in the recreational shore and combined video lengths, in the FWRI age-1 index, and in the recreational for-hire ages. A joint residuals plot assessing goodness of fit shows a root mean squared error of 47.5% for the indices, which is considered undesirable; fits to lengths and ages are considered acceptable. The model is sensitive to changes to natural mortality (M), with the data not supporting a lower estimate of M. An SSC member asked about the size at sexual maturity, noting the difference between the physiological (smaller) versus functional (larger) size at which 50% of individuals are estimated to be sexually mature. The SSC member thought that a best practices examination for whether to use physiological versus functional sexual maturity was needed; Dr. Forrestal agreed, and added that a sensitivity run examining that was not possible due to time constraints. Another SSC member added that such an effort looking at length at sexual maturity is underway.

### *Projections*

Dr. Forrestal summarized the projections settings, which set relative fishing mortality at the average of 2018 – 2020 and selectivity and retention at the values estimated for 2020. Recruitment follows the Beverton-Holt stock-recruit relationship, and with interim landings using the mean of landings from 2018 – 2020 for 2021 – 2023. Data for 2021 and 2022 have not been provided as final yet to the SEFSC. As of 2020, the stock is estimated as not overfished (2020 spawning stock biomass [ $SSB_{Current}$ ]/SSB at the maximum sustainable yield [MSY] proxy of 30% spawning potential ratio [30% SPR] = 1.6;  $SSB_{Current}$ /minimum stock size threshold [MSST;  $0.5 * SSB_{SPR30\%}$ ] = 3.2), and not undergoing overfishing (fishing mortality [F] from 2018 – 2020/ $F_{SPR30\%}$  = 0.659). The stock has not been overfished or undergoing overfishing throughout the time series. Council staff noted that Amendment 51 to the Reef Fish Fishery Management Plan established an MSY proxy at the yield at  $F_{26\%SPR}$ , as opposed to the  $F_{30\%SPR}$  that was used in the proposed base model. Council staff explained that when the terms of reference for the assessment were submitted, Amendment 51 had not yet been implemented and  $F_{30\%SPR}$  is a common MSY proxy for many reef fish stocks and thus was used as a default value. The SSC discussed estimates of recruitment, and whether to use a subset of more recent years or the entire model-derived time series. SSC members thought a consistent approach would be worth investigating. An SSC member thought that the recreational shore mode CPUE might be driving some of the model's estimated increase in recent recruitment, but not the lengths or ages from that fleet due to small sample sizes. Dr. Siegfried added that 2020 data lack contrast due to representing the terminal year in the model. Another SSC member noted that the SSC has in the past used the last 10 years to inform

recruitment when a stock is overfished, or when there is some ancillary information to inform using a similar shorter time period. They stated that in this case, there is no clear explanation for why recruitment has increased, and with a healthy stock projection, no immediate reason for being more conservative with estimating recruitment. Shore landings and the magnitude of recreational discards have increased over time; further, length and age compositions from the fishery-independent fleets are also observing greater numbers of smaller fish, which may also indicate positive recruitment. The SSC discussed whether the stock was in fact as productive as inferred by the  $F_{MSY}$  proxy, and the duration of time to use to inform recruitment. Another SSC member thought it may be useful to examine regional estimates of landings over time.

The SSC discussed the use of  $F_{26\%SPR}$  for gray snapper, and the parallels drawn at the time for Amendment 51 with the productivity of gray snapper compared to red snapper. At the SSC's January 2019 meeting, the SEFSC presented updated projections for gray snapper using three different values for  $F_{MSY}$  proxies ( $F_{26\%SPR}$ ,  $F_{30\%SPR}$ , and  $F_{40\%SPR}$ ), along with changing the MSST from  $1 \cdot M \cdot B_{MSY}$  to  $0.5 \cdot M \cdot B_{MSY}$ . The SSC found the presented analyses to be statistically sound and appropriate, and ultimately recognized that 26% SPR is scientifically acceptable as a proxy for MSY, but maintained its previous recommendation of the more risk averse proxy using 30% SPR because of the uncertainty in the SEDAR 51 assessment. Here, the SSC requested to see projections for SEDAR 75 using an MSY proxy of  $F_{26\%SPR}$ , consistent with the status quo from Amendment 51 to compare to the results of the current proposed base model.

The SSC discussed recruitment recommendations for the projections. Currently, the overfishing limit (OFL) uses the average model-derived recruitment deviations over the time period from the Beverton-Holt stock recruit relationship, and the acceptable biological catch (ABC) is decremented at 75% of the  $F_{MSY}$  proxy. The SSC noted that although recruitment has been observed to be much higher than the recent long-term mean, it is not expected to remain that high. SSC members discussed the merits of using long- and short-term recruitment means for OFL versus the ABC. Dr. Siegfried cautioned that  $F_{26\%SPR}$  represents the most optimistic plausible stock productivity estimate by the SSC in 2019, and recruitment is higher than the mean in recent history; however, the model does carry substantial uncertainty about certain parameters like recruitment, so it may be reasonable to consider those facts when evaluating the amount of risk to accept in the OFL and ABC projections. The SSC expressed some reservation about relying heavily on the recent recruitment estimates, absent as yet unheard clear justification of where that strong recruitment signal is coming from. As such, the SSC recommended continuing to use the long-term average recruitment deviations for the OFL. Dr. Tom Frazer, the Council representative, asked that a constant catch scenario for five years (i.e., 2024 – 2028) also be provided for the OFL and ABC. The SSC agreed that the ABC should be projected using 75% of the  $F_{MSY}$  proxy. For the interim year of 2021, the SSC recommended using the preliminary recreational and commercial landings from the Southeast Regional Office's Annual Catch Limit Monitoring Database<sup>3</sup>.

### *Updated Projections*

Dr. Forrestal described the 2021 recreational landings in pounds whole weight by fleet, and noted that these values were converted to numbers of fish for model input. The  $F_{MSY}$  proxy was updated to  $F_{26\%SPR}$  concurrent with Amendment 51. Under  $F_{26\%SPR}$ , the stock is not estimated to be

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<sup>3</sup> <https://www.fisheries.noaa.gov/southeast/2020-2021-final-gulf-mexico-stock-annual-catch-limit-landings>

overfished or undergoing overfishing as of 2020. The actual landings for 2021 were added, and the mean of landings from 2019 – 2021 were used to inform the interim years of 2022 and 2023. OFL and ABC projections for both  $F_{26\%SPR}$  and  $F_{30\%SPR}$  are shown in the table below, with ABC projected at the yield at 75% of  $F_{MSY}$  for each MSY proxy.

Table: OFL and ABC projections in millions of pounds whole weight (mp ww) under  $F_{30\%SPR}$  and  $F_{26\%SPR}$  for Gulf of Mexico gray snapper in MRIP-FES units.

Year	$F_{30\%SPR}$		$F_{26\%SPR}$	
	OFL	ABC	OFL	ABC
2024	7.758	5.820	9.402	7.063
2025	7.171	5.620	8.351	6.633
2026	6.601	5.394	7.405	6.199
2027	6.088	5.167	6.610	5.795
2028	5.647	4.952	5.969	5.438

An SSC member noted that the stock currently has more biomass in the water than is needed to sustain present harvest levels at either  $F_{MSY}$  proxy. An SSC member asked about the effect of setting the catch limits below the maximum allowed under each proxy. Another SSC member replied that the constant catch projection does exactly that. An SSC member added that recruitment and biomass would be expected to change with time, with another SSC member noting that  $F_{26\%SPR}$  is likely at the lower end of the acceptable spectrum of plausible MSY proxies for gray snapper. The SSC did not consider gray snapper less productive than red snapper, with respect to selecting an  $F_{MSY}$  proxy, but did acknowledge that  $F_{26\%SPR}$  was among the lowest observed in the Gulf. The SSC acknowledged a planned discussion about setting  $F_{MSY}$  proxies for March 2023.

**Motion: The SSC moves to accept the SEDAR 75 Gulf of Mexico Gray Snapper Operational Assessment as consistent with the best scientific information available. Under the current  $F_{MSY}$  proxy of  $F_{26\%SPR}$ , the model derived estimates indicate the stock is not overfished and is not undergoing overfishing.**

*Motion carried without opposition and 3 absent.*

**Motion: Based on the projection settings accepted by the SSC for the SEDAR 75 Operational Assessment the SSC recommends the following catch levels for Gulf of Mexico Gray Snapper: OFL be set as the yield (million pounds whole weight; mp ww) at  $F_{26\%SPR}$  and ABC as the yield (mp ww) at 75% of  $F_{26\%SPR}$  for the period 2024-2028.**

Year	OFL (mp ww)	ABC (mp ww)
2024	9.402	7.063
2025	8.351	6.633
2026	7.405	6.199
2027	6.610	5.795
2028	5.969	5.438

**The SSC also supports the constant catch scenario (which is a mean of the 5-year period) that results in an OFL of 7.547 mp ww and an ABC of 6.226 mp ww.**

*Motion carried without opposition and with 3 absent.*

### *Discussion: Acceptable Biological Catch Control Rule Modifications*

Dr. Katie Siegfried (SEFSC) presented alternative approaches to the current ABC Control Rule, used by the SSC for determining the scientific uncertainty between the OFL and the ABC. This information has previously been presented to the SSC in May 2021 and May 2022; following the latter SSC meeting, the SSC requested alternatives using the Ralston et al. (2011<sup>4</sup>) approach, the Restrepo et al. (1998<sup>5</sup>) approach, and the Privitera-Johnson and Punt (2020<sup>6</sup>) modification of the Ralston approach. The current ABC Control Rule has been in place since 2011; however, SSC members have regularly expressed a desire to revisit the control rule. This stems from the propensity for the buffer determined by the P\* approach generally resulting in a difference between the OFL and ABC that is not representative of the uncertainty in the stock assessment.

Dr. Siegfried reviewed the SEFSC's evaluation of Stock Synthesis (SS) models, with older models still needing to be mined for relevant data. Issues exist with differences in how SSB is defined (i.e., as metric tons, number of eggs, and eggs per recruit), and the SEFSC is still considering how to incorporate assessments with structural changes (e.g., total versus female-only SSB as with gag grouper). The SSC is familiar with the Restrepo et al. (1998) suggestion of 75% F<sub>MSY</sub> (or its proxy) to set the ABC, and the SEFSC frequently provides these values in projections. The SEFSC started with the Ralston et al. (2011) analysis, and is in consultation with Dr. Kristin Privitera-Johnson for the projection-based estimates. Further work was precluded due to other time commitments but will be presented at a successive Gulf SSC meeting.

The SS assessments examined so far include those for cobia, greater amberjack, gray snapper, red grouper, vermilion snapper, and red snapper, which constitute 13 total assessments. Dr. Siegfried described trends in SSB by species and assessment for common metrics, like SSB as measured in mature female weight and fecundity in number of eggs. She demonstrated using examples from the Ralston approach the calculation of the sigma value ( $\sigma$ ), which influences the width of the distribution for the residuals based the log deviations from the included stocks.

For the first Ralston approach, Dr. Siegfried showed for each estimate of biomass (B) for year "t" from assessments "i" and "j", the SEFSC calculated the proportional deviation of assessment i using assessment j as a standard. Based on a symmetry argument, the SEFSC also repeated the calculation for the proportional deviation for assessment j using assessment i as a standard, and all the ratios were log transformed, with the distributions being perfectly symmetrical. For each stock under consideration, the standard deviation ( $\sigma^*$ ) of the ratios was calculated. This statistic is positively biased; however, because it is based on the ratio of two lognormal random variables

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<sup>4</sup> <https://media.fisheries.noaa.gov/dam-migration/ns1-ralston-et-al-2011.pdf>

<sup>5</sup> <https://www.st.nmfs.noaa.gov/Assets/stock/documents/Tech-Guidelines.pdf>

<sup>6</sup> <https://academic.oup.com/icesjms/article/77/2/515/5675586?login=false>

( $B_{i,t}$  and  $B_{j,t}$ ). The appropriate bias correction term ( $\sqrt{2}$ ) was derived and applied so that the corrected estimator is  $\sigma = \sigma^* / \sqrt{2}$ .

For the second Ralston method, the mean of biomass estimates in a year is treated as the best estimate of central tendency. In this approach, variation in  $B$  was measured as squared deviations from the annual mean in log space. The third Ralston method is only used for red snapper, with the most recent stock assessment (SEDAR 52 2018) being considered the best estimate of the central tendency. This approach is the same as the second approach, except that the mean is replaced by the logarithms of  $B$  from the last assessment. With this approach, the most current information is assumed to represent the best estimate of the population mean. For determining between-assessment uncertainty, two methods were considered for pooling stock-specific uncertainty: first, to take the average of the stock-specific uncertainty; and, second, to aggregate all residuals and calculate the standard deviation of the pooled set. The first method gives each species equal weight and does not overemphasize stocks that have been assessed more frequently. Conversely, the second method treats each data point as an independent observation. Neither approach is ideal given the lack of independence in the data. While method 1 provides  $\sigma$ , methods 2 and 3 are provided as a CV due to the weight versus fecundity issue. Two estimates are provided where possible, from 1981 forward (when MRIP data start) and from 1993 forward (when the rest of the data like discards are commonly available). Between-estimate uncertainty is estimated as 0.41 for 1981-forward, and 0.39 for 1993-forward.

Dr. Siegfried reviewed the Privitera-Johnson and Punt revision, which uses an updated Ralston analysis and shows a  $\sigma$  value of 0.403 (compared to 0.36). The SEFSC anticipates that this approach will account for more uncertainty than the historical biomass approach. The Privitera-Johnson and Punt approach will require more work due to the more extensive data requirements for the analysis, and the SEFSC may need to slightly modify the approach due to the Gulf's use of allocations in the projections. Some SS report files do not contain all the necessary information, so the SEFSC will have to revisit those assessments. Future work will include continued data-mining and completion of the Privitera-Johnson and Punt approach.

The SSC discussed the way the seven analyzed species were categorized as "coastal pelagic" or "snapper/grouper" as the fisheries are prosecuted differently. Another SSC member asked why king mackerel was not included in the species list, and if it was due to the species already having a recent update stock assessment. Dr. Siegfried responded that king mackerel will also be included in the evaluation at a later time. The SSC also discusses the similarities on the uncertainty values (i.e., ~0.4) among all methods and wondered if there may be a parameter that could be anchoring the analysis. Dr. Siegfried also noted the same trend and explained how she explored changing various parameters in the model, but was not able to achieve an increase in uncertainty.

An SSC member liked the ensemble modeling style of the Ralston method, and asked whether it could be used to better evaluate uncertainties across sensitivity analyses. Dr. Siegfried replied that it may infer that each of those sensitivities was equally plausible. The SSC has expressed a desire to replace the  $P^*$  approach due to its narrow buffer calculation, and has been using a Restrepo approach more frequently. An SSC member proffered an idea of a "high", "medium", and "low"  $P^*$  value, with those  $\sigma$ -informed  $P^*$  values applied based on the estimated categorical uncertainty from an assessment. Doing so would assign a decrementing percentage to the ABC from the OFL.

Another SSC member discussed the criteria for sorting stocks into different tiers based on data richness. The buffer between the OFL and ABC would then use a multiplier of  $\sigma$ . Dr. Shannon Cass-Calay (SEFSC) noted that the use of  $P^*$  in this way should be substituted by  $\sigma_{\min}$ , or the minimum estimate of uncertainty. A similar approach is in use in the U.S. Caribbean, and could also be applied in the Gulf.  $P^*$ , by contrast, represents the Council's acceptable risk of overfishing. Currently, the upper bound of acceptable risk for the Council is a 50% probability of overfishing, and the lower a 30% probability. The group also suggested developing and comparing a Gulf-wide  $\sigma_{\min}$  versus a species-specific.

An SSC member expressed reservations about using data back to 1981, given the uncertainty about landings data prior to the finalization of the then Marine Recreational Fisheries Statistics Survey in 1986 (now, MRIP). Dr. Siegfried noted that data in some assessments go back much further, but agreed that many assessments at least make mention of lower confidence in those data, while others exclude those older data. The SSC appreciated the work completed thus far on the Ralston approaches, and looked forward to seeing more at its May 2023 meeting.

### *Evaluation of Updated Red Snapper Calibration Ratios for Gulf State Surveys to MRIP*

Fishery biologists representing marine fisheries agencies from Florida, Alabama, and Mississippi presented proposals to revise calibrations for each state's respective estimates of private vessel and state charter for-hire landings of red snapper to MRIP's Coastal Household Telephone Survey (CHTS). These proposals updated the years and waves considered by the SSC in August 2020 and provided justifications for these selections.

#### *Florida*

Ms. Tiffanie Cross (FWRI) presented Florida's proposal. Florida uses the State Reef Fish Survey (SRFS) to measure catch, fishing effort, and estimate landings, for several reef fish species. Ms. Cross noted that SRFS only covers the recreational private vessel (no shore or for-hire) mode for 13 reef fish species, including red snapper. Effort estimation is conducted via a monthly mail survey. Survey participants are identified by matching mailing addresses provided by reef fish anglers who must possess the state's no-cost State Reef Fish Angler designation to land reef fish. Differing from MRIP-FES, SRFS stratifies the mail survey effort by home addresses and assumes more Florida marine fishing effort occurs among residents living within coastal counties relative to centrally located counties and neighboring states (Georgia and Alabama). Mail surveys are intended for the specific angler and request trip date, fishing location, and catch for up to 9 fishing trips within the past the month while MRIP-FES requests fishing information from the past two months. The form includes a fillable calendar and map to aid in angler memory retention of spatiotemporal information.

SRFS catch data are estimated from dockside intercepts and complement the MRIP Access Point Angler Intercept Survey (AP AIS). Intercept sampling sites are randomly selected at the same time for both surveys, but considerations are taken to ensure there is not overlapping intercept sites between the two surveys that would result in double counting. Estimates of under-coverage, or

anglers landing reef fish without the requisite license add-on, is estimated to be 50% from intercept survey data. Ms. Cross stated that, in 2020, the catch portion of the survey was markedly reduced by closures of public fishing access points due to COVID-19 safety protocols; however, responses to the mail portion of the survey were not reduced.

Reporting on time periods of survey overlaps, Ms. Cross indicated that MRIP-CHTS overlapped with SRFS (then the Gulf Reef Fish Survey) from May 2015 through December 2017, and SRFS produced landings estimates similar in magnitude to MRIP-CHTS but with improved precision. By comparison, estimates from MRIP-FES (implemented in 2018 and presently in use) are consistently higher than SRFS and less precise. Rationale for the improved precision with SRFS was attributed to stratifying the mailing survey by county and the focusing on collection of fishing information at a one-month scale to improve angler memory retention.

Ms. Cross clarified Florida's goal is to convert catch advice derived from future stock assessments using MRIP-FES to the same currency as the SRFS at an annual scale for each applicable species. Additionally, calibration would allow for hindcasting in developing a historical time series that incorporates the SRFS experimental design. She then provided rationale for the proposed years to inform the updated calibration. Prior to 2018, recreational harvest seasons varied widely across state and federal jurisdictions. Historically, between 2015-2017, fishing seasons lasted weeks or days, and varied between state and federal waters. Since then, fishing seasons have lasted two months or more, and have been consistent in state and federal waters.

Ms. Cross described how the landings estimates and their variance are calculated, which was unchanged from the 2020 calibration. For each of the paired sums of annual estimates between SRFS and MRIP-FES, the ratio was calculated as the total SRFS estimate divided by total MRIP-FES estimate, excluding Monroe County. The delta method was used to approximate the variance of the ratios, as it incorporates error associated with both the numerator (SRFS estimates) and denominator (MRIP-FES estimates). Because the degree of correlation between SRFS and MRIP-FES catch survey component is unknown, the variance ( $\rho$ ) between them was estimated at 0, 0.5, and 0.9. The annual MRIP-FES landings estimates for numbers of fish and weight were multiplied by the corresponding ratio, with the variance again approximated using the delta method.

Ms. Cross detailed four options for a calibration ratio informed using varying time series: May 2015 – December 2019 (original calibration); May 2015 – December 2017 (SRFS and MRIP-CHTS overlap years, recommended by the SSC in August 2020); 2018, 2019, and 2021 (SRFS and MRIP-FES overlap years); and, all available overlapping estimates from May 2015 to December 2021, excluding 2020. The resulting ratios are not statistically dissimilar between SRFS and either MRIP-CHTS or MRIP-FES for any of the options presented.

An SSC member asked if there had been any changes to the SRFS experimental design and if those changes affected the interpretation of the estimates. Ms. Cross answered that response rates to the mail survey increased by a few percentage points by improving the survey readability. Another SSC member asked why the SSC recommended using May 2015 – December 2017. Ms. Cross replied those were the years of survey overlap; however, the relationship between the two surveys diverges as time goes on. This is because MRIP-CHTS was discontinued in 2017 with the implementation of MRIP-FES. Landings reported in MRIP-CHTS currency are presently model-

derived from landings collected in MRIP-FES and calibrated back to MRIP-CHTS based on a dynamic relationship from the overlapping years for MRIP-CHTS and MRIP-FES (2015 – 2017).

An SSC member asked about how changes to the correlation value between the catch estimates for SRFS and MRIP influenced the calibration estimates. Ms. Cross replied that the ratio itself is not impacted by the correlation factor, but rather the error estimated around the ratio. The SSC discussed the merits of converting to MRIP-CHTS rather than MRIP-FES. Current codified catch levels for red snapper are in MRIP-CHTS. Since 2018, data have been collected in MRIP-FES and then must be converted to MRIP-CHTS estimates for monitoring purposes. Until the completion of a stock assessment for red snapper, which is being conducted using MRIP-FES, state surveys will have to calibrate to MRIP-CHTS.

Confounding interpretation further, the calibration factor between MRIP-CHTS and MRIP-FES is increasing over time in Florida due to the dynamic model-derived estimates that project declining response rates in landline telephone use. Council staff noted that their examination of the ratio of the state landings to MRIP-CHTS showed a relatively stable relationship for Alabama and Mississippi, but Florida has more than doubled since 2015.

Another SSC member asked whether Florida has explored what would be necessary to get SRFS to produce MRIP-FES caliber magnitudes of annual catch and effort estimates. Ms. Cross replied that extensive research has been done to explore the relationships between the surveys. Stratification of the surveys had little effect, while MRIP increasing their sample sizes could improve precision for that survey. Ms. Cross added that simplifying the effort survey mailed to anglers improved the response rate.

An MRIP Gulf Transition Team Subgroup has been formed to investigate differences between the state surveys and MRIP-FES. The team has developed short- and long-term research goals to improve understanding of recreational fisheries data collection in the Gulf. In the interim, for red snapper, calibration to MRIP-CHTS will be required until the results of the stock assessment are available to be considered for use in management. An SSC member inquired as to whether the average angler was aware if a given survey was SRFS or MRIP and FWC staff indicated that most anglers likely could not distinguish between the two.

### ***Alabama***

Mr. Kevin Anson (Alabama Department of Conservation and Natural Resources) presented the Alabama proposal for recalibrating their Snapper Check survey to MRIP-CHTS. The primary objective of the program is to provide monitoring of the private recreational sector for the red snapper fishing season. Mandatory reporting and dockside sampling participation are required to land red snapper as a private angler during the fishing season. The dockside survey intercepts also collect biological and trip information. Dead discards are not required to be reported. Residency status (state and county) of each interviewed angler is collected during each wave at all sites, and used to adjust the effort information calculated from the effort survey. Matching of effort and catch data is conducting using unique identifiers supplied on the landing reports and collected in dockside surveys. This also allows for the calculation of non-response to the effort survey.

Annual reporting frequency of vessels with red snapper interviewed in Snapper Check oscillates around 40% from 2014 – 2021. APAIS intercepts are conducted by the same staff as for Snapper Check intercepts. For effort, Snapper Check measures by the vessel, whereas MRIP measures by the angler. An SSC member asked whether a vessel could have been sampled more than once within a year, with respect to the reporting frequency of vessels with red snapper. Mr. Anson said yes, that some vessels could have been sampled more than once. He added that a landing report with Snapper Check is only required if the vessel is landing red snapper.

Mr. Anson also provided a summary of observations from data collected through the program. He stated more interviews are conducted annually for APAIS than for Snapper Check; however, Snapper Check tends to record a larger proportion-positive of vessels with red snapper than APAIS. He continued that the requirement to maintain counts of anglers could lead to decreased numbers of intercepts being collected at sites with high boating/angling activity. Further, frequent assignments at sites with high angler activity and low intercept productivity may result in an unrepresentative sample of fishing trips or anglers at those sites. The duration of the Alabama red snapper fishing season has steadily increased from 2018 – 2020, and nearly tripled from 2020 to 2021. Harvest estimates for Snapper Check are generally less than those predicted by the model-derived MRIP-CHTS estimates, but have demonstrated less difference between those annual estimates in recent history. Mr. Anson also investigated whether there were any wind speed-related anomalies that could have affected fishing effort and found generally consistent mean wind speeds (about 10 knots) across years. MRIP-CHTS harvest estimates were shown to be highly variable from 2011 – 2018, but more stable from 2018 – 2021. By contrast, Snapper Check harvest estimates have increased slightly each year since 2014, due in large part to increases in Alabama’s state-specific ACL for red snapper for its private angling component.

Mr. Anson presented differences in fishing effort observed between Alabama’s two coastal counties (Baldwin in the east and Mobile in the west). Angler counts in APAIS during open red snapper seasons are substantially higher since 2014, and more anglers are being interviewed by APAIS in Baldwin County, which hosts more tourism and non-coastal resident anglers. An SSC member asked what was driving the difference in harvest estimates between Baldwin and Mobile counties. Mr. Anson replied that angler skill and stock productivity could be factors, adding that western Alabama waters off Mobile County are thought to be more productive. Another SSC member asked whether this discrepancy between counties is contributing to differences in observed mean weight and length. Mr. Anson thought that more representative sampling of lengths and weights was being accomplished through Snapper Check than MRIP. Mr. Anson also thought a sampling bias may be present in the allocation of samples between the coastal counties, with Baldwin County being proportionally oversampled based on the composition of its angler population compared to Mobile County.

Mr. Anson concluded that 2018 and 2019 MRIP-CHTS may be elevating effort estimates caused by sampling that was not representative of Alabama’s anglers. He added that daily angler effort has been significantly reduced in 2021 and 2022 compared to 2018, as the fishing season duration has increased 340%; however, Snapper Check harvests have increased slightly (due to ACL increases) and declined in MRIP-CHTS. Mr. Anson said that having a sufficient ACL will help minimize the need to set fishing season durations that are short and promote derby-style behavior in anglers. He estimates that the current calibration ratio applied to Alabama’s state-specific ACL

will result in a 20-day fishing season duration using 2018 and 2019 data. Lastly, Mr. Anson thought the issue of reduced sampling efficiency requires further investigation and should be included in upcoming MRIP Transition Team topics of research.

An SSC member asked about changes requested by the MRIP consultants, when those changes were implemented, and if any were considered “major”. Mr. Anson replied that changes were recommended prior to, and implemented in, 2017. These program modifications did not result in large changes to the estimates of catch and effort. The SSC member also asked whether increased season durations led to a decrease in derby fishing behavior. Mr. Anson replied that longer seasons seem to place less emphasis on the race to fish, compared to shorter season durations which tend to instigate derby fishing behavior. Dr. Cody added that the sample distributions for APAIS as presented are misleading, and the weightings of those sample distributions are necessary to fully understand how those samples are allocated. An SSC member asked about the relationship between the proportional standard error (PSE) related to fishing season duration. Mr. Anson replied that the PSE increased with decreased fishing season duration.

An SSC member thought that for a calibration to be successful, a similar trend needed to be present between the surveys. They observed a “dome-shaped” trend in harvest for MRIP-CHTS, but a gradually increasing trend from Snapper Check. Mr. Anson thought the issue with MRIP-CHTS was on the effort side of that survey, specifically with how CHTS is estimating effort compared to Snapper Check. Another SSC member observed that the ratio between MRIP-CHTS and Snapper Check has increased in recent years (2019 – 2021), during which the MRIP-CHTS estimate of landings decreased. The SSC member asked the degree to which stock dynamics were at play, and recalled recent public testimony from some Alabama anglers that the stock was not as healthy as in previous years. Another SSC member replied that the instantaneous fishing mortality in nearshore habitats was high, but overall not as high as the shallow reefs. They added that abundance estimates indicate more red snapper off Alabama, but that those fish are generally smaller. Mr. Anson also recalled the localized depletion described by some anglers in recent public testimony, and that a recent survey about depth-specific harvest found that federally-permitted charter vessels were catching most of their fish in waters shallower than 120 feet.

An SSC member asked about the inclusion of for-hire vessels in Snapper Check. Mr. Anson replied that Snapper Check includes private and state-permitted for-hire vessels. He also clarified that angler trip estimates were provided for time periods by year during which the federal and state waters were open to harvest, and for when only state waters were open. Another SSC member commented on the 2017 fishing season, which initially had a 3-day season duration followed by a 39-day weekend-only fishing season implemented by the Department of Commerce. The SSC member thought this resulted in a repeated federal waters derby fishery, which could have resulted in variable effort estimates by region depending on many factors like angler density and biomass. The SSC member thought that management bias in general was less of a factor beginning in 2018, when state fishing season durations stabilized under the exempted fishing permits.

The current SSC-approved calibration for red snapper uses 2018 and 2019, and results in a ratio of 0.4875. Alabama does not recommend using a longer time series outside of the period when Snapper Check was certified for use by NOAA OST. Use of 2020 is considered appropriate by Alabama, which maintained similar intercept performance and weight collection beginning in May

2020 before the start of the red snapper season. Alabama's proposal recommends using all waves from 2020 and 2021 only to update its calibration ratio. Mr. Anson thought that periods of high angler activity may affect sample collection in the MRIP-CHTS dockside survey, and that sampling discrepancies could lead to inappropriate adjustment or weighting of effort data. He added that 2020 and 2021 data are more similar than 2018 and 2019.

### *Mississippi*

Mr. Trevor Moncrief (Mississippi Department of Marine Resources) presented an overview of Mississippi's Tails 'n Scales survey (TnS). The survey is mandatory and uses a unique trip identifier which is valid for 24 hours. Anglers cannot make another red snapper trip under TnS until they complete reporting on the previous trip. Mr. Moncrief stated that one of the strengths of TnS is the enforcement, which observes approximately 95% compliance. TnS has operated consistently within the 2018 – 2021 time frame, with limited modifications to the user experience interface for the required mobile application and changes to aid law enforcement. The State of Mississippi has promulgated regulations that allow law enforcement to cite individuals who do not report, or inaccurately report, red snapper landings through TnS. Deliberate non-compliance is estimated to be a maximum of 2% of all trips. Mr. Moncrief mentioned specification of effort by county and noted that compliance for trips originating from private access points is nearly identical to public access points. Mississippi has also hired a statistical consultant to explore using a model-based estimation program. When asked if TnS operated more like a census, Mr. Moncrief replied that if used for commercial landings, TnS estimates would be accepted as reported.

Mr. Moncrief outlined Mississippi's proposed revised calibration, which limits the comparison between TnS and MRIP-CHTS to waves 3 and 4 (May-June and July-August). There is concern about the validity of MRIP estimates outside of the high use waves (3 and 4) from 2018 – 2020. Waves in which the red snapper fishery does not primarily occur are subject to larger disparities in estimates, which is likely associated with a smaller number of completed MRIP surveys. Mr. Moncrief stated that MRIP requires a large amount of surveys, and a small number of surveys can result in large volatility in wave estimates of catch and effort. Despite occurring during the part of the fishing season with the greatest fishing effort, landings data from MRIP wave 3 continues to show volatility that is unexplainable. Mississippi has chosen to use 2018 – 2020 to lessen the impact of the large magnitude observed in MRIP wave 3 estimates that occurred in 2 (2019, 2021).

When comparing estimated MRIP fishing effort and Mississippi's recreational license data, newly derived effort estimates using MRIP-FES potentially represent a significant overestimation of angler effort. Mr. Moncrief stated that with approximately 80,000 licensed anglers in Mississippi each year, in order to reach the 2018 – 2020 MRIP-FES trip estimate of over 4.5 million trips, each angler would need to take on average 57 fishing trips per year. With a public ramp capacity of 34 launch sites and 882 boat trailer parking spots, the total number of private boat trips, with every ramp at full capacity for 365 days of the year, is 1,020,600 angler trips annually (3.17 anglers/vessel assumed). If 30% of trips come from private docks, then the estimate increases to 1,326,779 angler trips annually, which is still less than the MRIP-FES estimate of 1,563,070 angler private angling component trips. Mr. Moncrief noted that though MRIP is statistically rigorous and peer-reviewed, it may not be appropriate for a small state with lower sampling frequency.

Mr. Moncrief discussed consistency issues with distributions of fishing effort. From 2010 – 2015 (under MRIP-CHTS), a normal distribution of effort by wave is observed. For 2015 – 2017 (overlap between MRIP-CHTS and MRIP-FES), spikes in estimates from waves 1 (January-February) and 6 (November-December) are observed; Mississippi's red snapper fishing season is closed during these waves. Mr. Moncrief thought spikes in wave 1 are likely contributing to the red snapper estimates for those years. In 2018 – 2021 (under MRIP-FES), a different distribution pattern is observed in the annual landings estimates. When examining the weighted APAIS intercept distribution from 2015 – 2019, an appropriate representation of seasonal variation in effort is observed. Mr. Moncrief thought that a critical assumption of MRIP-FES, that APAIS is representative of fisheries trends, is not supported in Mississippi, due to a lack of correlation between the number of surveys of a given species and its harvest estimate; a positive relationship is observed for TnS.

Mr. Moncrief described Mississippi's concerns with wave 5 (September-October) from MRIP-FES, which represents a low sample size wave subject to large disparities in estimates likely due to the amount of effort attributed to them. Further, shifting magnitudes of estimates in wave 3 suggest uncertainty in those estimates despite season duration consistency during that wave from 2018 – 2021. Mr. Moncrief expressed concern over the ratio of area fished that attributes the effort across strata. Further, he expressed concern over strata-specific distribution of effort for the coastal and non-coastal matched samples versus the unmatched samples. Mr. Moncrief thought selection of sites on exceptionally high traffic weekends near the opening of the season may affect the ratio of effort across a sampled area. He noted Mississippi's willingness to fund state-focused research for MRIP, researching private dock metrics, reporting bias, and abandoned trips. Mr. Moncrief said that continuing work with a contracted statistical consultant on a new model-based estimation method and sensitivity analysis of estimation methods is ongoing. In the meantime, he thought that adding new years of data would not yield different results, and presented data for red snapper from 2022 as an example. Therein, wave 3 represented the second-highest estimate (approximately 22,800 pounds per day) from the entire time series of the modern fishery outside of 2012. Conversely, wave 4 in 2022 represents the lowest wave 4 estimate (outside of zero; approximately 300 pounds per day) ever produced in the modern fishery.

An SSC member asked about the penalty for non-compliance with TnS. Mr. Moncrief replied that in addition to a citation and fine, the fish on an improperly reported trip are confiscated. He added that vessels leaving from private docks are nearly as likely to be intercepted as those from public access points due to Mississippi's coastal geography. Another SSC member asked how Mississippi was converting from MRIP-FES estimates to MRIP-CHTS. Mr. Moncrief replied that Mississippi is using the 2.18 ratio determined with the initial calibration in August 2020. The SSC member then asked about the error about the estimates from MRIP-FES versus TnS. Mr. Moncrief replied that the surveys are so different that their variance estimates aren't comparable. He added that the MRIP-FES PSE estimates are routinely over 50 (indicating a very imprecise estimate) by wave for Mississippi. The SSC member then asked why 2021 was being excluded from the proposed calibration. Mr. Moncrief replied that the estimate from wave 3 for 2021 continues to diverge strongly from what is observed in TnS and in MRIP's APAIS survey, and is implausible.

Dr. Frazer asked whether it would be possible to discern a relationship between MRIP-CHTS estimate of landings data from the region to the estimate from TnS, and use that as a calibration

method. Mr. Moncrief replied that such a relationship could be investigated. An SSC member commended the effort put into TnS, and the demonstration of the implausibility of the MRIP-FES estimates for Mississippi. He thought based on the justification for excluding 2021, which he supported, he thought it could also be appropriate to exclude 2019, but recognized the benefits of selecting a continuous time series. Another SSC member recognized the issues present with MRIP estimates from small states, and thought effort estimation needed to be investigated with uncertainty quantified when considering calibrations between surveys. The SSC member added that many of the consultants involved in this process, while expert statisticians, are not intimately involved with the fishery and fishermen, and likely do not fully understand the dynamics of how the fishery operates which can affect their recommendations.

Dr. Cody noted that for MRIP, Florida, and Louisiana harvest estimates are derived using an effort survey along with a separate dockside survey; whereas, Mississippi and Alabama operate a single survey to provide catch and effort information. He added that a relationship between the variance of estimates, as opposed to the number of APAIS samples, may better correlate to the resultant landings estimates. An SSC member asked whether MRIP has researched some of the issues outlined for Mississippi, such as the effect of low sample sizes, for improving the accuracy and precision of MRIP's estimates. Dr. Cody replied that exploring these issues was one of the goals of the MRIP Transition Team and the SEDAR 74 Research Track assessment for red snapper.

An SSC member commented that observations of high landings for particular years and waves had associated large PSEs. The SSC member inquired of NOAA OST whether it would be possible to implement a raking approach to adjust the weighting and address the potential distortion. Dr. Cody replied that the information required for such modeling may not be available. He instead proffered that non-sampling error could be contributing to these issues. Mr. Moncrief replied his observations were that those instances with abnormally high landings often exhibited relatively smaller PSEs, so he thought adjustments to those values may not resolve the problem.

The SSC discussed that the Council will need a recommendation that is scientifically defensible. It is likely that MRIP struggles to represent landings information in small regions like Mississippi. On the other hand, TnS is certified, a near census design, and has relatively low PSEs. There was then discussion among the group if directly using TnS landing estimates would be more desirable than selecting a few MRIP waves as a defensible option. An SSC member thought if that logic were to be applied, then Alabama may need to be assessed similarly. An SSC member noted the two purposes of the calibration: conducting stock assessments and quota monitoring. A common currency is necessary to compare the landings between states to determine total regional harvest, and to project that harvest forward from stock assessments. The SSC largely agreed that there was not enough information collected from the states yet to make the determination of not calibrating. Instead, the group decided that building a record for calibration was most appropriate at this time.

### ***SSC Evaluation of Terms of Reference***

The SSC was tasked with considering the following terms of reference for each state's proposal:

1. *Is the proposed revised calibration ratio calculated in a method that is not dissimilar from that which was approved as consistent with the best scientific information available (BSIA) by the SSC in August 2020?*
2. *Is the justification for the year(s) and waves(s) recommended for calculating the proposed revised calibration ratio sufficient? If not, describe why and if possible, offer alternatives.*
3. *Are there any additional clarifications necessary for considering a state's proposed revised calibration ratio as being consistent with BSIA?*

### Florida

The SSC acknowledged Florida's justification for excluding 2020 due to disruption of the catch portion of the survey during the COVID-19 pandemic. SSC members discussed the merits of moving away from 2015 – 2017 data due to the inclusion of the CHTS telephone survey, which has identified biases related to the gatekeeper effect (only speaking with the individual answering the phone) and the wireless effect (the transition of households from landline to mobile phones). Florida did not select a preferred method, relying instead on the judgement of the SSC to determine the most appropriate time series. An SSC member thought that, for consistency, it might be appropriate to exclude consideration of 2015 – 2017 for all states. The SSC discussed whether it was more appropriate to sum the landings between the surveys and then determining the ratio, or to average the ratios for the years considered. An SSC member noted that the direction from NOAA OST was to sum the landings between the surveys and then determining the ratio.

The SSC specified that any changes to calibration ratios would apply only to successive years for quota monitoring purposes, and was not a factor in the stock assessment. An SSC member asked whether the higher PSEs for the 2018, 2019, and 2021 option in Florida's proposal relative to the other options was a concern. Another SSC member noted that while higher than other options, the calculated PSEs relative to the proportional correlation were not high in principle. An SSC member asked about the ratio of the MRIP-CHTS or -FES estimates against the SRFs estimate for 2020. Ms. Cross said that the ratio for 2020 was not included in Florida's report, but noted that it was equivalent to 2.1, which is similar to surrounding years. However, the sampling activity in 2020 was atypical, so while the calibration ratio for that year was similar to others, the sample sizes of the intercepts was markedly different. Some SSC members thought this was justification for excluding 2020, but noted that this circumstance for 2020 was specific to Florida. The SSC justified treating 2020 calibration ratios differently between the three states due to varied state government pandemic safety protocols and the duration of public resource access closures.

**Motion: The SSC recommends that the proposed Florida's calibration from SRFs to MRIP-CHTS for the private angling component of red snapper use data from 2018, 2019, and 2021 to determine the updated calibration ratio of 1.29 in numbers of fish and 1.34 in pounds whole weight.**

*Motion carried with two abstentions and three absent.*

In addressing the terms of reference, the SSC found that the methodology used by Florida was not dissimilar from that proposed as BSIA in August of 2020. The SSC recommended using 2018, 2019, and 2021 for Florida's updated calibration ratio based on the aforementioned justification. After discussing the changing relationship between MRIP-CHTS and MRIP-FES from 2015 to 2021, the SSC sought no further clarification on Florida's proposal.

### Alabama

The SSC acknowledged that the methods used by Alabama were similar to those determined to be consistent with BSIA in August of 2020. Mr. Anson stated that the number of trips taken in 2018 and 2019 were estimated as higher than the same estimated for 2020 and 2021, Alabama's preferred option. An SSC member did not think the justification provided by Alabama adequate for excluding 2018 and 2019, solely based on the ratio for 2018 and 2019 being lower. The SSC member thought the rationale for including 2020 was firm, given that Alabama's angler intercepts and effort survey were functioning as intended during 2020. The SSC noted that there was not a considerable change in methodology in sampling between 2018 and 2021. Mr. Anson noted that daily effort, daily harvest, and red snapper body length and weight compositions of landings declined in 2020 and 2021 compared to 2018 and 2019. The biomass observed in 2018 and 2019 is not currently as large.

SSC members discussed any additional clarifications requested. An SSC member asked about the number of fishing days by year. Mr. Anson replied that there were about 28 days in 2018, 34 days in 2019, 43 days in 2020, and 124 days in 2021. Mr. Anson added that longer season durations reduce the propensity for derby fishing behavior, resulting in lower daily estimates of catch and effort. An SSC member said that management was consistent from 2018 – 2021; however, if the relationship between Snapper Check and MRIP-CHTS is changing, that dynamic relationship is not well described in the information presented. Mr. Anson replied that those data were not currently available, but acknowledged that the difference between the MRIP-CHTS and Snapper Check estimates was decreasing with time, and the reason for that changing relationship should be investigated. An SSC member thought that 2021 may be more different from 2018 – 2020, given the near three-fold increase in the fishing season duration in that year, and in the daily estimates of catch and effort. Another SSC member added that fuel prices increased about 50% from 2020 to 2021. An SSC member replied that they thought information about gas prices and angler behavior were largely speculative with regard to their effects on harvest rates, and did not rise to the level of justification for excluding 2018 and 2019. Another SSC member thought that 2018 – 2021 were similar enough in most respects to be considered together.

**Motion: The SSC recommends that the proposed Alabama's calibration from Snapper Check to MRIP-CHTS (Snapper Check / MRIP-CHTS) for the private angling and state charter for-hire component of red snapper use data from 2018, 2019, 2020, and 2021, to determine the updated calibration ratio of 0.548 in pounds whole weight.**

*Motion carried with two abstentions and three absent.*

In addressing the terms of reference, the SSC found that the methodology used by Alabama was not dissimilar from that proposed as BSIA in August of 2020. The SSC did not think there was adequate justification for using only 2020 and 2021 for Alabama's calibration ratio. The SSC recommended using 2018 – 2021 for Alabama's updated calibration ratio based on the aforementioned discussions. The SSC sought no further clarification on Alabama's proposal.

### Mississippi

Mr. Moncrief clarified that the calibration ratio between MRIP-CHTS and MRIP-FES used originally by Mississippi was that which was used in August 2020 by NMFS; however, this ratio changes with time and years used, and thus the ratio has been updated from 2.18 to 1.66 for Mississippi's preferred scenario of waves 3 and 4 from 2018 – 2020. This change results in a revised calibration ratio of 0.503.

Mr. Moncrief stated that while the magnitude of catch for 2019 and 2021 were both implausibly high, Mississippi accepts using 2019 to have a consistent, three-year time series to inform its calibration. An SSC member thought excluding 2021 simply because of the magnitude of the estimates from wave 3 and 4 in that year may not be appropriate. Observing anomalies in those waves is not unprecedented and it was argued that an appropriate calibration ratio would reflect those anomalous observations within its calculation. Another SSC member countered that Mississippi demonstrated quantitatively that the estimate from 2021 was not possible for the state's anglers to achieve, and that excluding such data is normal practice in science. An SSC member acknowledged the point, but noted that if the ratio is to be useful, it should still account for the high variability in the MRIP-CHTS estimates. Another SSC member thought it more appropriate to either include both 2019 and 2021, or exclude them, but not to treat them differently. An SSC member noted that if 2021 is not realistic, then excluding it is reasonable based on best practices and the scientific literature. Another SSC member observed that two years are lower (2018, 2020) and two higher (2019, 2021), so discerning a trend based on a sample size of two in each mode is not possible.

An SSC member did not think there was much risk to the red snapper stock in recommending Mississippi's proposal, versus also including waves 3 and 4 from 2021. Another SSC member thought that the overall risk of not calibrating Mississippi's data likely had comparable risk. Mr. Moncrief replied that the August 2020 calibration ratio, which is being proposed to be updated here, has been implemented by NMFS and will substantially reduce Mississippi's landings. Mr. Strelcheck added that whether the SSC recommends a revised calibration ratio or no calibration ratio, that recommendation needs to be supported by sufficient justification in order for it to be considered as consistent with BSIA. An SSC member thought that adding a calibration ratio was inherently more conservative than doing nothing, but not likely much better, since the scatter of the MRIP-CHTS estimates is so highly variable in Mississippi.

**Motion: The SSC recommends that the proposed Mississippi's calibration from Tails 'n Scales to MRIP-CHTS (Tails 'n Scales / MRIP-CHTS) for the private recreational sector of red snapper use data from 2018 – 2020, as the base years and restricts the harvest comparison to just waves 3 and 4. The updated calibration ratio is 0.503 in pounds whole weight.**

*Motion carried 12-5 with 5 abstentions.*

In addressing the terms of reference, the SSC found that the methodology used by Mississippi was not dissimilar from that proposed as BSIA in August of 2020. The SSC agreed with excluding 2021 due to the implausibility of that estimate, and understood the justification provided by Mississippi for using only waves 3 and 4. The SSC recommended using waves 3 and 4 from years 2018 – 2020 for Mississippi’s updated calibration ratio based on the aforementioned discussions. The SSC sought no further clarification on Mississippi’s proposal.

### *Review of Gulf Red Grouper Interim Analysis and Projections*

Dr. Katie Siegfried (SEFSC) presented the 2023 Gulf red grouper interim analysis (IA), using landings and data and the NMFS Bottom Longline (BLL) index of relative abundance through 2022. These data have been prepared to help inform the SSC about the condition of the Gulf red grouper stock, for which the catch limits were previously reduced following the SEDAR 61 stock assessment in response to projections about substantial episodic mortality from the 2018 red tide in the eastern Gulf. Catch limits were subsequently increased following the 2021 interim analysis, which indicated the index of abundance used to track the population trend for the stock had improved. The SEFSC provides these interim analyses for Gulf red grouper annually for SSC evaluation; the 2022 interim analysis was provided as a “health check”.

Dr. Siegfried noted the ongoing 2022 red tide episodic mortality event in the eastern Gulf, which has not resulted in hypoxic events, but has resulted in some fish kills. In 2021, the red grouper IA adjusted catch advice using an index-based harvest control rule (HCR) and a 3-year moving average of the NMFS BLL. This 2023 IA also adjusts catch advice using an index-based HCR and a 3-year and 5-year moving average of the NMFS BLL. The reference year of 2018 is the first year following the terminal year in the SEDAR 61 stock assessment (2017), and corresponds to a reference catch of 5.57 million pounds gutted weight (mp gw). The updated index includes 2020, which saw reduced spatial coverage in sampling due to the COVID-19 pandemic. Higher abundance was observed in 2021, with a decrease following in 2022; however, over the last 10 years, the trend in the index was flat. Using a 3-year average, the adjusted catch limit could be 6.58 mp gw including 2020, of 6.45 mp gw excluding 2020 from the recent mean. Using a 5-year average, the adjusted catch limit could be 5.75 mp gw including 2020, or 5.49 mp gw excluding 2020. Council staff noted that the proposed adjusted ABC for the 3-year average was higher than the current OFL, and asked if updated OFLs could be generated, as was done for the 2021 red grouper IA. The SEFSC noted that it would have less confidence in the estimation of the OFL and ABC as the amount of time elapsed from the terminal year of the last stock assessment increases. That said, the OFL could be re-specified using a similar  $C_{Ref}$  approach as is used for the ABC. The SSC not opposed to scaling the OFL based on the same method as the ABC, and thought that the buffer between the OFL and ABC should increase as the time from the terminal year of the last assessment increases.

An SSC member thought that the sampling conducted in 2020 missed a considerable portion of the geographic range of red grouper on the west Florida shelf, which may be justification for excluding 2020 from the calculation of the adjusted catch recommendation. For the scenarios where 2020 is excluded, the 3-year average actually represents 2021 and 2022, and the 5-year represents 2018, 2019, 2021, and 2022. The SSC member also asked that error about the point estimates for the relative abundance be expressed in the future. The SSC discussed the amount of time elapsed since the terminal year of the assessment, acknowledging that the IA does not update other factors like changes in growth, reproduction, recruitment. The SSC acknowledged that uncertainty about the catch advice should be expected to increase as time increases from the terminal year (2017) of SEDAR 61, and that it does not generally support catch recommendations beyond 5 years from the beginning of the initial projections period. It was noted that the results from the next planned red grouper operational assessment are not anticipated to be reviewed by the SSC until 2025, with management advice expected thereafter. Further, if a change in catch limits were recommended by the SSC at this meeting, that management change would not be expected to take effect until early 2024 at best, at about the same time the next red grouper operational assessment begins.

The current OFL for 2023 is 5.99 mp gw, and the ABC is 4.96 mp gw (approximately a 17.2% buffer between the OFL and ABC). The SSC noticed that the recreational sector was estimated to have landed 172% of its ACL in 2021 and 163% of its ACL in 2022. Due to the overage in 2021, the season duration in 2022 was monitored and reduced by SERO to try and account for the 2021 overage; however, an overage in 2022 still occurred. SERO will evaluate season duration projections for 2023 in an attempt to constrain landings for the recreational sector. Thus, while the increased recreational CPUE and landings in 2021 and 2022 are likely indicative of a recruitment event of fish into the fishery, it is not possible to discern whether the stock can continue to support harvest levels of that magnitude.

The SEFSC noted that the increase in 2021 recreational landings wouldn't have been picked up in the 2021 NMFS BLL index value, but the continuance of that recreational harvest may eventually be influential. An SSC member countered that the NMFS BLL was not likely the best index to represent the ages and lengths of fish harvested by the recreational sector, which largely operates in shallower waters and lands smaller fish than the longline index or the commercial fleets, which is currently allocated 59.3% of the stock ACL.

**Motion: The SSC recommends not modifying the current catch limits for Gulf red grouper based on the 2023 interim analysis.**

*Motion carried without opposition.*

### *Public Comment – Summary from All Days*

#### **Captain Eric Schmidt (Ft. Myers Florida):**

- He agrees with the SSC recommendation to not to do anything with red grouper right now.

- The stock assessment process is more transparent than it used to be but takes too much time. Once an assessment is finally ready for review, and the Council can act based on that review, the management decision may no longer be appropriate or even needed.
- The entire process (assessment to management decisions) needs to be streamlined. The current process makes it difficult for those in the fishery to operate businesses.
- Assessment processes and management decisions in other regions are much timelier than they are in the Gulf. He re-iterated that the SEDAR process and management decisions take years, which can be extremely detrimental.

**Captain Bob Zales (Panama City, FL, Southern Offshore Fishing Association):**

- Part of the problem with the management changes in Reef Fish Amendment 53 was the increase in allocation to the recreational side, at a cost to the commercial sector. The commercial sector is being punished for the lack of accountability and high discards in the recreational sector. Mr. Zales disagrees with the recommendation made by the SSC on red grouper.
- Assessment processes are not standardized, or even operate in the same manner across regions in the United States but fishermen don't understand that; Mr. Zales is aware of this based on feedback from the members he represents. Council staff should work on outreach materials, with the other agencies, to explain the different management agencies and their processes (i.e., Gulf Council, NMFS, SEDAR, SSCs).
- He requested that a discussion occur on red grouper at the upcoming January Council meeting because it is adversely affecting the commercial sector.

**Dr. Michael Drexler:**

- Speaking on the concerns and performance of interim assessments, the SSC can help others understand how effective they are in the overall assessment process, but there is no cross-sectional approach to determine how well they work across all species:
  - For the Council, he suggests building on the catch reports provided at Council meetings by adding a regular process that looks at the interim assessments and catch performance across all stocks
  - For the SSC, a biennial process on IAs to help the Committee understand and diagnose the current health and conditions of the stocks

*Other Business*

No other business was brought before the SSC.

**The meeting was adjourned at 12:00 pm eastern time on January 12, 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.](#)