Gulf Council
Standing and Special Shrimp
Scientific and Statistical Committee
Meeting Summary
February 24-26, 2026
Webinar

The meeting of the Gulf Council Standing Scientific and Statistical Committees (SSC) was convened at 8:30 AM EDT on February 24, 2026. The agenda for this meeting was adopted, and the minutes from the January 2026 meeting were approved as written.

Review: SEDAR 87 Gulf Penaeid Shrimp Stock Assessment Reviews

Drs. Molly Stevens and Lisa Ailloud (Southeast Fisheries Science Center [SEFSC]) presented new stock assessments for Gulf brown, white, and pink shrimp. These assessments are part of the SEDAR 87 stock assessment process, which evaluated new ways of assessing these species. Three alternative stock assessment models were tested for each species: JABBA (Just Another Bayesian Biomass Estimate), EDM (Empirical Dynamic Modeling), and VAST (Vector Autoregressive Spatio-Temporal Model). Dr. Ailloud summarized the modeling approaches used, historical landings, fishery independent surveys used to inform the model, and fleet effort. SSC members confirmed that landings presented included state and federal waters and remarked on the contraction of the fleet effort and participation with time. SSC members also noted changes in fishing practices with a shift to target larger shrimp with larger mesh sizes, particularly for white shrimp, which garner a higher dockside price than brown shrimp.

Fishery independent trawl surveys (Fall/Summer SEAMAP, TPWD Gulf Survey) were used to inform the VAST model for brown shrimp, and analysts addressed stakeholder feedback about trawl sampling bias. An SSC member asked whether spatiotemporal effects would be detectable from the index in the VAST model. Dr. Ailloud replied that although there is known spatiotemporal variability, the data resolution does not allow for spatiotemporal analysis. SSC members commented on the pre- and post-2005 hurricane trends in the index and discussed possible effects from effort contraction or the *Deepwater Horizon* oil spill in 2010. Dr. Ailloud acknowledged the potential drivers but noted that direct effects could not be modeled. In discussing the tow direction and its effect on catch per unit effort (CPUE), Dr. Ailloud noted that the shrimpers tow in the direction to maximize shrimp harvest, whereas the fishery independent surveys tow in a uniform cardinal direction.

Dr. Ailloud reviewed the JABBA model, which was ultimately not recommended for use for brown shrimp. The JABBA model demonstrated good stability during diagnostic testing and in retrospective analyses, but predictive power was lower than expected. The model lacked contrast, key assumptions were likely violated (environmental and economic), and the current status of the population is sensitive to assumptions about natural mortality.

Dr. Stevens reviewed the EDM model and highlighted that when only a few variables are observed in a system, time lags can be used to reconstruct full system dynamics. Modelers then do not need

data on all variables to make accurate predictions, or to specify model form. Model configuration requires defining the system to be modeled, stratifying data to capture system variability, defining catchability, approximating system dynamics using time lags in observed states to account for unobserved variables, and using factorial design to investigate the impacts of decisions. Dr. Stevens reviewed the model selection procedure and how maximum sustainable yield (MSY) was determined, which was defined as the long-run average yield at the optimal constant harvest rate.

Dr. Stevens reviewed the EDM model for brown shrimp, which was informed by the SEAMAP fall and summer trawl surveys. Landings and CPUE were stratified by season and shrimp size class (small, medium, large). This method considers the full variability in the system with real-time fluctuations by size class. The top performing models for brown shrimp were both size-structured, with the ultimate base model choice also using shared catchability among size classes. The historical peak of harvest for brown shrimp was in 1990 at just over 105 million pounds of tails (mpt), and the MSY projections from EDM all exceeded 200 mpt. Retrospective analyses showed model stability in MSY. The base model recommends an MSY equal to 215.07 mpt, with the biomass at MSY (B_{MSY}) equal to 405.39 mpt, and the terminal year biomass in 2022 equal to 1,716.53 mpt. The terminal year biomass over B_{MSY} is 4.23 (importantly, greater than 1), indicating the stock is healthy. Dr. Stevens also reviewed some economic data from past presentations to the Gulf Council, characterizing changes in imported and domestic shrimp prices and effort. SSC members discussed the changes in fishery dynamics to target larger shrimp, resulting in spatial and temporal shifts in fishing effort compared to past years when imports were of a lower magnitude compared to domestic harvest.

Dr. Ailloud reviewed the VAST index development of the Louisiana Department of Wildlife and Fisheries (LDWF) trawl survey for white shrimp, which followed a similar trend to that for brown shrimp and was recommended for consideration in a JABBA model. However, Dr. Ailloud described those results and diagnostics and decided not to use JABBA for assessing white shrimp. Dr. Stevens then reviewed the EDM model for white shrimp, also informed by the LDWF trawl survey. The historical peak of white shrimp harvest was approximately 85 mpt in 2006. Retrospective analyses showed model stability with respect to estimated MSY. The most parsimonious model captured white shrimp dynamics while providing stable estimates of MSY. Ultimately, MSY was estimated at 87.80 mpt, B_{MSY} = 148.35 mpt, terminal year biomass in 2022 (B_{2022}) = 449.9 mpt, and B_{2022}/B_{MSY} = 2.48 (greater than 1; not overfished).

Dr. Ailloud reviewed the VAST index development of the SEAMAP trawl survey for pink shrimp, which used far fewer years than brown shrimp (2010 – 2022 compared to 1980 – 2022) due to data availability. This index was recommended for consideration in a JABBA model for pink shrimp. Dr. Ailloud described those results and diagnostics, which were inconsistent and highly variable. Most of the models for pink shrimp did not converge and those that did were not useful for informing catch, and this led to a recommendation not to use JABBA for assessing pink shrimp. Dr. Stevens then reviewed the EDM model for pink shrimp, informed by the SEAMAP summer trawl survey only, and found that the top performing models all lacked predictive capability. Thus, EDM is also not recommended for pink shrimp.

Dr. Ailloud reviewed recommendations received from the Center for Independent Experts regarding the shrimp assessments. Other longer-term recommendations, which were beyond the

scope of the current stock assessments, are discussed in the reviewer reports. Dr. Stevens compared benchmark estimations for brown and white shrimp. As a result of the review, EDM was recommended for both brown and white shrimp. This modeling environment does not require life history data or any functional form, captures large fluctuations in biomass, and is thought to accurately project into the future.

Dr. Ailloud clarified that differentiation between day and night tows was not done for white shrimp as for brown shrimp. The SSC member asked about the capacity to update the stock projections in successive years. The SEFSC replied that it would have to evaluate workloads, but that it was possible, if necessary. Another SSC member asked about fishery-dependent CPUE data for pink shrimp off southwest Florida, compared to using fishery-independent survey data, noting also that the roller trawls tend to target smaller (small to medium) pink shrimp. SEFSC staff commented on a mismatch between size class representation between fishery-dependent and -independent harvest methods. Circling back to a previous SSC question, the SSC noted that there are regulations in some states regarding opening dates to allow inshore access before shrimp move offshore, and the SSC also noted the Texas closure to allow for a larger harvest size.

The SSC discussed the interval at which these models should be revisited. An SSC member suggested updating the models if the fishery begins to approach MSY levels of harvest on a consistent basis. The SEFSC thought this approach was feasible. Another SSC member said that smaller skimmer vessels are becoming preferred by the shrimp fleet, which combined with self-imposed quotas to ensure better prices, are resulting in lower volumes of harvest per trip. The SSC member did not project growth in the fishery, expecting niche markets to be important to the fleets moving forward and indicated social and economic shifts in the fishery were likely in the future. Another SSC member thought consideration of permit buyouts and other regulations should be considered by fisheries managers as ways to positively impact the fleets. An SSC member said that despite the environmental unknowns in the population dynamics, the EDM models seemed sufficient for generating estimates of MSY and therefore, management advice. The SSC member added that future work could be predicated on shifts in fishery dynamics, new environmental data, or landings approaching MSY.

> **The SSC considers the Empirical Dynamic Modeling approach for Gulf brown and white shrimp, with developed benchmark estimates (brown shrimp MSY = 215.07 mpt; white shrimp MSY = 87.80 mpt) as consistent with the best scientific information available.**
>
> *Motion carried without opposition.*

The SEFSC added that a pink shrimp model could be revisited once a longer time series of trawl data are available. In the meantime, using the third highest catch or the average from a reference time series may be the best option. The mean pink shrimp landings from the last three years used in the model (2020 – 2022) are 8.55 mpt, which is less than half of the third highest catch (19.3 mpt). This recent catch against an MSY proxy informed by the third highest catch implies that pink shrimp are not undergoing overfishing (recent catch / MSY_{Proxy} is less than 1).

SSC members asked about the application of the ABC Control Rule, and specifically the data-limited Tier 3a, which is informed by a period of average catch. Council staff recalled SSC discussions about variability in the landings history and added that the ABC Control Rule was not designed with annual crop species like penaeid shrimp in mind, and thus its appropriateness for application in this situation would need to be justified. An SSC member said that in the absence of better data, the SSC may not have the ability to estimate MSY, necessitating either recommending a proxy or not recommending anything.

NOAA General Counsel affirmed the SSC's ability to consider its ABC Control Rule, or a justified alternative approach, in its recommendation of MSY for pink shrimp. Dr. Stevens noted that the mean plus two standard deviations of the landings from 2020 – 2022 was 17.26 mpt, which was near the fourth highest landings for pink shrimp on record. An SSC member thought this approach, while not a strict adherence to the ABC Control Rule, may be a compromise considering the data available. Another SSC member thought that basing the MSY off recent landings may be biased by the contraction of shrimping effort driven by economic factors, and not representative of what the pink shrimp stock is capable of producing.

The SSC recommends using the third highest catch of pink shrimp from 1996 (19.3 mpt) for establishing MSY and providing management advice to the Gulf Council.

Motion carried with one opposed and two abstentions.

The SSC discussed setting the ABCs for each of the penaeid shrimp species. An SSC member recalled the SSC recommending some buffer between the ABC from the OFL, as in for finfish species, to account for scientific uncertainty.

The SSC recommends ABC = MSY for the brown, white, and pink shrimp fisheries in the Gulf.

Motion carried with three opposed and one abstention.

Council staff noted that Amendment 13 established optimum yield for the penaeid shrimp stocks equal to MSY, so OY values were not revisited. Council staff reviewed the overfishing and overfished thresholds for brown, white, and pink shrimp, based on values set in Amendment 15 to the Fishery Management Plan for Shrimp Resources in the Gulf. In the wake of the updated scientific advice from SEDAR 87, the SSC was asked to reconsider these definitions for the three penaeid shrimp stocks.

The overfishing threshold is defined as the maximum fishing mortality threshold (MFMT). The MFMT for each penaeid shrimp stock is defined as the exploitation rate at MSY (F_{MSY}). The values are: brown shrimp = 0.460; white shrimp = 0.592.

Motion carried without opposition.

The overfishing threshold for pink shrimp is defined as annual landings relative to the MSY proxy. If this ratio exceeds 1, the stock status is overfishing.

Motion carried with one opposed.

The overfished threshold is defined as the minimum stock size threshold. The MSST for each penaeid shrimp stock is defined as the biomass at MSY (BMSY). The values are:

- **Brown shrimp: 405.39 mpt**
- **White Shrimp: 148.35 mpt**
- **Pink shrimp: undefined**

Motion carried without opposition.

The SSC favored reviewing trends in landings for the three shrimp species every few years. The SEFSC closed by noting that this was the first stock assessment effort that incorporated economic data and thanked the SSC for its review.

Update: Shrimp Bycatch Methodology Working Group for Finfish Species

In May 2025, the SEFSC presented an updated shrimp bycatch methodology for use in stock assessments, and at the time, the SSC noted that it would have preferred to have had more time to review the work presented. Council staff have been working with SEFSC staff to gather background information to inform a comprehensive presentation of the methodology to the newly created Shrimp Bycatch Methodology Working Group for Finfish Species. The outcome of this work is expected to affect numerous upcoming stock assessments in the Gulf. Council staff will keep the SSC apprised of future developments.

Public Comment, February 24

Capt. Bob Zales: Southeastern Fisheries Association
He encourages economics to be included in all future monitoring. He all also recommended that H2B visas for crew extend to the entire fleet and noted that the 75% citizenship US Coast Guard regulations are an issue for vessels with small crew sizes. For vessels fishing for HMS species, the captain must be a US citizen, but the crew can all be foreign. The entire commercial fleet is antique because construction costs of new vessels are too high. He wants seafood to be recognized like agriculture so that those subsidies will apply to seafood producers.

Leann Bosarge: Bosarge Boats, Mississippi
She expressed appreciation to the Science Center and Council for dedicating effort and time to shrimp. She appreciates recognition of where the industry is and the prevailing concern for the fleet rather than the stock. She's still trying to comprehend the changing status determination criteria metrics as the shrimp fishery is exempt from annual catch limits. Historically the MFMT = F_{MSY} and MSST = SSB_{MSY}, and now we have ABCs that are a catch noting that ACLs are not required or recommended. She doesn't want shrimp management to be conflated with finfish management. She noted that the new EDM model has never been used for shrimp management and could benefit from additional testing to determine the forecast performance on data outside of the data used to build the model before it's put into practice. White shrimp bounces around in the

new model and would result in an overfishing and overfished designation even though it's the one shrimp stock that's been increasing. This doesn't reflect what's on the water and the SSC discussion seemed more optimistic than the final decision to set the MSY near the max catch. This could have negative implications for the future of the industry. She stated that CPUE is used in production models, and she has concerns and fears about the decision to use the new model.

Review: MSE Evaluations of MRIP-FES Recalibrations

Dr. Skyler Sagarese (SEFSC) presented management strategy evaluations (MSE) of the effects of recalibrated recreational landings data from the federal Marine Recreational Information Program's (MRIP) Fishing Effort Survey (FES). The purpose of this work was to explore the effects of various degrees of bias in MRIP-FES landings estimates and to quantify the potential effects for fisheries managers. Dr. Sagarese summarized the telescoping bias effect found to affect the MRIP-FES landings estimates presented to the Gulf Council in 2023, and the work to correct this bias by the NOAA Office of Science and Technology. The original test case for MSE evaluation of MRIP-FES bias re-examined the results of the Spanish mackerel stock assessment (SEDAR 81) with a 40% reduction in recreational landings. The results showed that while the stock status was unaffected by the 40% reduction in recreational landings, recommended catch limits and harvest rates decreased.

Dr. Sagarese described recent MRIP-FES MSE efforts for Gulf gray triggerfish, which is currently being assessed via SEDAR 100. The gray triggerfish assessment model used in SEDAR 62 was refit with the expected data and then adjusted the recreational harvest to account for the bias correction. The Operating Model (OM) was then refit with this bias correction to isolate the effect of correcting the landings for the telescoping bias. Dr. Sagarese presented four iterations:

- a base OM which assumes the recreational harvest is correct,
- a constant 40% OM which assumes recreational harvest is 40% higher than true,
- a uniform OM assuming uniformly distributed recreational removals are between 40% to 80% higher than true, and
- a constant 40% to 0% OM that assumes the historical data are 40% higher than true but corrected in future projection years.

An SSC member asked about scaling the units after making bias adjustments. The SEFSC replied that if the adjusted harvest is put back in without scaling, then the landings data will not match up against the prescribed catch limits. Another SSC member asked about the treatment of the landings data from Texas. Dr. Sagarese replied that Texas data were not calibrated to MRIP and were used as-is. An SSC member asked whether additional variance was being estimated by adjusting the recreational harvest under each of the scenarios. Dr. Sagarese replied that only the recreational data were being adjusted, and the difference in total landings fed back into the stock assessment may appear variable but is so only due to annual differences in the ratio of recreational to commercial landings. She clarified that in practice she used the SEDAR 43 stock assessment model but substituted the historical MRIP Coastal Household Telephone Survey recreational data with the same from MRIP-FES.

Dr. Sagarese reviewed how the MSE results were evaluated. Relative spawning stock biomass (SSB) was examined for its trend relative to projections across model runs. Relative population and fishery dynamics were generally well estimated by the base OM. Current management still achieved depletion, exploitation, and yield targets, supporting the idea that the landings misspecification from bias is more of a scaling issue. However, when recreational catches were misspecified, the empirical models could not estimate SSB or recruitment. Also, management outcomes following an uncalibrated change in removals were worse than when a constant or randomly biased data stream was utilized. Dr. Sagarese added that this result highlighted the importance of calibrating removal survey data before combining those estimates (e.g., SRFS) with historic MRIP-FES removals estimates.

An SSC member asked about the finding that, "robust management advice could still be provided" despite the bias issues with the recreational data, so long as the estimated bias remains constant and is not changing with time. The SSC member asked if there had been any work to examine how the past ACLs would have been affected by the telescoping bias. SEFSC staff replied that a specific analysis of the past ACLs had not been done; however, relative to the assumptions made under each OM scenario, the current management paradigm was still effectively managing the fishery within each OM. Another SSC member countered that the assumption that using the same survey resulted in uniform bias to that survey, stating that people in different areas have been shown to respond in different ways to the same survey for a number of factors. An SSC member noted that directional or trending bias by species is possible, which can result from management biases. Council staff suggested that MSE objectives be co-developed with fisheries managers to ensure the relevance and applicability of the analyses. Dr. Sagarese noted that bag limit changes, a previous Council-requested MSE for Spanish mackerel that was canceled by the Council, remain difficult to simulate, but agreed with remaining current with management objectives to make MSE results as applicable as possible. Another SSC member asked whether the SEFSC has looked into the effects of trending bias within year and across years. The SEFSC replied that they had simulated a 4% increasing trend across years, against which some models did not perform well.

Dr. Sagarese detailed follow-up work, including sector allocations which can be affected by changes to scale relative to new data units. Present work is examining how to evaluate multiple sector allocation scenarios simultaneously to show the effects of considered changes on the stock for gag grouper, greater amberjack, and red grouper. Another long-term goal is to work on harvest control rules, and testing ABC control rule parameterization for Gulf stocks, and a contractor has been hired to work on this part of the project.

Review: Greater Amberjack Interim Analysis and Catch Advice

Dr. Siegfried presented an interim analysis (IA) for Gulf greater amberjack, using the Gulf Fishery Independent Survey of Habitat and Ecosystem Resources (GFISHER) composite video index as the representative index of relative abundance. The GFISHER index was used in the form of its component video surveys in the last stock assessment of greater amberjack (SEDAR 70 2018). This IA does not provide a recommendation for revising catch advice. Notably, greater amberjack has been assessed five times since 2004 and has been found to be overfished and undergoing overfishing each time, and the current rebuilding plan is expected to conclude in 2027. Another

stock assessment is planned to begin in 2027 and will consider the results of the regional Greater Amberjack Count collaborative research project.

Several members of the SSC pointed out that there was a relative lack of sampling of GFISHER in nearshore habitats off the coast of Louisiana. The GFISHER team agreed and indicated that spatially expanding the survey was ongoing; however, they noted that the increased turbidity characteristic of this region due the outflow of the Mississippi River causes substantial issues in the ability of the cameras to effectively count fish. Other SSC members noted that greater amberjack, while reef associated, are often observed throughout the water column and suggested that vertical profile sampling could help improve visual detection probabilities of greater amberjack. Overall, the SSC acknowledged that the migratory nature, seasonality, and behavior around sampling gear makes estimating abundance of greater amberjack challenging. An SSC member reminded the group that the results from the Greater Amberjack Count will be presented in the Council office March 24-27. He added that those presentations would address some of the issues highlighted by the SSC.

Review: SEFSC Stakeholder Participatory Workshops

Drs. Mandy Karnauskas (SEFSC), Matthew McPherson (SEFSC), and Carissa Gervasi (SEFSC-NOAA Affiliate) presented a summary of applications of participatory research methods and recent research on utility and use of participatory modeling in fisheries management. Three case studies were presented for discussion:

1. Application of participatory modeling to implementation of ecosystem-based fishery management with an emphasis on red tide events in the Gulf,
2. Application of participatory modeling to better include socioeconomic factors into the Gulf red snapper stock assessment, and
3. Application of participatory modeling to management strategy evaluation for dolphin/wahoo in the South Atlantic.

An SSC member inquired on case study #1 whether the intention of the participatory research was focused on the red tide event, or there were other objectives. Dr. McPherson responded that given the timing of the research, the red tide event was the most pervasive issue in the community at that time, which resulted in productive research that is being incorporated into management for the fisheries ecosystem plan.

Following the presentation of case study #2, an SSC member asked about how stakeholders are involved following the conclusion of interviews and participatory modeling research. Dr. Gervasi and Dr. Karnauskas noted that the working papers and publications are shared with interviewees and interactive participatory modeling diagrams are made available to the public to allow for continued engagement. Several SSC members inquired about how the selection process for stakeholders to participate in the interviews and expressed concern over representation in the participatory modeling by stakeholders across the Gulf from different sectors. Dr. Gervasi replied that selection of anglers to interview varied across sector, but there was a concerted effort to engage with stakeholders who are not typically part of the Council process and represented fisheries throughout the Gulf and sectors. An SSC member asked if the participatory models were to take place again, would similar participants be targeted, or would the participatory modeling

best be suited for different set of anglers, particularly recreational. Dr. Gervasi replied that it would be an interesting follow-up to target a different group of red snapper anglers to see if there is consistency in replies across years and assessment periods.

An SSC member asked when participatory modeling is most valuable for use in the assessment and timing given the staff resources necessary for this approach. Dr. McPherson noted that this type of participatory modeling approach is best utilized in major stock assessments (e.g., Caribbean Spiny Lobster and Gulf Red Snapper). Following the conclusion of the presentation, An SSC member noted that using the participatory modeling structure in management may reduce some of the inherent bias of those who participate in the typical Council process and is a valuable effort to include in assessments and other management approaches.

Presentation: Application of a discrete-time survival model to estimate discard mortality, a case study with Gulf of America gray triggerfish (Balistes capriscus)

Dr. Challen Hyman (University of South Florida Center for Environmental Analysis, Synthesis, and Application [CEASA]) presented the results of research to model discard mortality of Gulf gray triggerfish. His work examined the effects of environmental variables in long-term conventional tagging datasets on gray triggerfish recapture rates, estimated post-release mortality considerate of variable fishing effort, and then built a discrete-time model to infer post-release mortality in gray triggerfish. Dr. Hyman's team's study examined tagging data for over 3,700 fish tagged between 2022 and 2024 from the charter for-hire fleet. He commented that some effects on discard mortality are classically harder to distinguish from one another including depth effect, surface water temperature and other variables. Using a threshold effect, the model is able to determine at which point a variable (like sea surface temperature and depth, respectively) affects post-release survival.

By assuming a 100% baseline survival rate under the "optimal" conditions of a release depth less than 30 meters and into waters as cool or cooler than 22 degrees Celsius, Dr. Hyman estimated a median discard mortality rate of 31 – 35%. As the baseline survival rate decreases, the discard mortality rate increases. Further, the model estimated variable discard mortality rates with time of year relative to depth fished and surface temperatures during those times of year.

Dr. Mike Allen (Gulf Council Liaison) asked for clarification about the increasing annual estimates of post-release mortality over time, to which Dr. Hyman had attributed increasing distance from shore as an explanatory variable. Dr. Hyman clarified that the underlying assumption is that private recreational and the for-hire fleet are behaving similarly, and fishing progressively further offshore. Dr. Hyman noted that approaches to manage discard mortality may need to consider species-specific biology with respect to barotrauma. The SSC noted possible differences in fish handling and angler affinity which may affect discard mortality rates. An SSC member thought this work was an important advancement from past work that was based only on evaluation of surface releases, which likely underestimate true post-release mortality. Another SSC member commented on the temperature effect, which based on when recreational fishing effort peaks (in the summer months, during which surface temperatures are higher), could mean that fishing season has a much greater effect on post-release survival than is currently incorporated

in stock assessment models. The SEFSC added that discard mortality for gray triggerfish is a continuing work product for SEDAR 100 during the assessment process.

Council staff asked about the incorporation of descending and venting into the model. Dr. Hyman noted that descending was almost non-existent in the observed data (n=10 fish descended across all three years of recaptures). An SSC member added that the morphology of the gray triggerfish's mouth (small, full of teeth) makes it difficult for some anglers to attach a descending device. The effect of venting was absorbed by depth, since anglers seem to only want to vent fish in the presence of obvious barotrauma. Council staff added that tagged gray triggerfish may be targeted by other fish given gray triggerfish dominance and territoriality, which may affect tag retention and recapture rates of fish. The SSC discussed the increasing trend in estimated discard mortality and the proposed relationship with increasing depth fished. Dr. Hyman replied that there are likely several reasons to explain the projection of fishing effort further offshore, including more efficient vessels, better technology, management biases and other factors, noting that these effects may vary spatially.

Presentation: Leveraging statistical models to improve pre-season forecasting and in-season management of a recreational fishery

Dr. Hyman (CEASA) presented a novel approach for projecting fishing season duration for recreational fisheries, using Gulf gag grouper as a case study. Dr. Hyman's work leverages past fishing conditions, regulations, and economic considerations to better predict future harvest rates, and improves fishing season forecasting. In the model, the response variable was the monthly harvest rate represented as the pounds harvested divided by days open. The mean harvest rate was a function of the season duration and type, past harvest average, harmonic terms, year, and the percent of the month open during the red snapper season. The "hurdle" function was based on whether any recreational gag season was open (federal or state).

Dr. Hyman described variations in gag harvest against the fishing season duration by year from 2015 through 2024. He noted that there was some odd behavior with out-of-season harvests, which appeared as spikes outside the open season where the bulk of harvest was predicted to occur. For each approach, Dr. Hyman multiplied the predicted harvest rate for a given month by the number of days open in a month to obtain monthly harvest. Then, estimates were compared under three scenarios: the full dataset; datasets with individual years withheld; and datasets with individual months withheld. Model results showed that simply using the historical data as they were without accounting for within-and between-year variance underperformed the model created which accounted for that variance. In evaluating how much better the new model predicted fishing season duration compared to the old projection method, Dr. Hyman's model was demonstrated to be more precise both within and between seasons. In a ground truthing exercise, Dr. Hyman tested the model's ability to predict the 2025 gag fishing season, and the model predicted that the landings would be just under the modified annual catch target (ACT) for 2025. In truth, the recreational landings did not exceed the ACT, supporting the model's estimation.

In summary, Dr. Hyman's work is an improvement over the current season projection methods, as it explicitly models and accounts for effort compression. This new season projection model is expected to be useful for projecting recreational fishing season durations for Gulf gag and red

grouper, as well as individual state-level projections. Council staff asked whether it was possible to automate the model for management use. Dr. Hyman replied that the model was "plug and play", and it is intended to project the 2026 gag fishing season. An SSC member thought it would be useful to develop an in-season forecasting model. Dr. Hyman agreed, acknowledging that the data require refinement and work on the back end; however, in practice the data are just not available quickly enough to more accurately predict the fishing season duration compared to forecasting before the start of the fishing season. SSC members and Dr. Hyman also acknowledged the potential effects of weather on forecast accuracy.

Discussion on Economic Effects of Mid-year IFQ Quota Modifications

Council staff provided an overview of the IFQ programs in the Gulf and presented data and economic models for red snapper, gag, and red grouper. For each species, staff discussed annual quotas and monthly landings, ex-vessel and IFQ allocation prices. Council staff discussed mid-year quota changes and noted that the timing of quota increases depends on the date of implementation of the regulatory action considering the quota change.

Council staff discussed the economic models considered, estimation results, and limitations. Based on estimation results, staff indicated that a 1% increase in the red snapper ex-vessel price is expected to result in a 0.68% change in the red snapper IFQ allocation price. The models discussed did not adequately show statistical significance between allocation prices and specific mid-year quota increases. A Committee member noted that it is challenging to include instantaneous shock such as mid-year quota increases in a model with monthly data and suggested that alternative specifications of the mid-year quota increases could improve the results.

An SSC member asked about the expected effects of quota changes on prices. Council staff noted that, in 2016, a two-million-pound increase in the commercial red grouper quota resulted in notable decreases in IFQ allocation prices. Council staff indicated that a decrease in allocation price could adversely impact those who sell IFQ allocation but could benefit small operators who buy allocation to fish. An SSC member stated that some IFQ participants, including dealers, may line up allocation to buy at the beginning of the year and noted that the Council's discussions about upcoming quota changes would affect their behavior. An SSC member indicated that improving the predictability of quota increases would allow participants to make more informed decisions. Another SSC member stated that improving predictability may be more challenging in the Gulf because the Council manages mixed-use fisheries including recreational and commercial sectors.

Public Comment, February 25

None received.

Check-in: SEDAR 100: Gulf Gray Triggerfish Stock Assessment

Dr. Skyler Sagarese presented a check-in for the SSC for the ongoing stock assessment for Gulf gray triggerfish (SEDAR 100). Dr. Sagarese noted that SEDAR 100 is the first stock assessment where the SEFSC is using SSC check-ins to receive feedback and make model modifications ahead of the Review Workshop, which is scheduled for August 2026. She reviewed the

assessment history and discussed the last stock assessment attempt (SEDAR 62) which was not completed due to multiple data issues. Among them were issues with age compositions, driving that assessment to consider lengths instead. Since then, research on aging methodology by Dr. Jennifer Potts (SEFSC), and validated by Dr. Will Patterson's lab at the University of Florida, has largely resolved these aging issues. Dr. Sagarese said that for SEDAR 100, fishery-dependent data are split into eastern versus western Gulf to explore differences in selectivity and fishing mortality. Dr. Sagarese requested feedback on two main modeling questions:

- Which composition data (length, age, or both) to use and how to define selectivity (age-based or length-based)?
- Do data support a true two-area (East vs West) model configuration, the continuity approach of treating fishing fleets as areas, or a Gulf-wide model?

Dr. Sagarese reviewed the data considered in the last completed stock assessment for gray triggerfish (SEDAR 43 2015), which had a terminal year of 2013. Major changes will be applied to SEDAR 100, among which include recreational harvest in MRIP-FES units, shrimp bycatch estimation, inclusion of G-FISHER, and updated age-based data inputs derived with new aging methodology (growth, M, maturity-at-age, compositions). Indices not recommended for use in SEDAR 100 include MRIP East CPUE, Commercial East and West CPUE, the SEAMAP Fall Plankton Survey, and Headboat data from 2008 forward. The start year for SEDAR 100 is presently 1945 (but is to be evaluated), and the terminal year of data is 2024. The continuity model assumes a 1:1 sex ratio and a 1-area, 1-season approach with maturity modeled as a function of age and fecundity as a function of length. Dr. Sagarese recommended consideration of SSB as a measure of reproductive potential over batch fecundity estimates, which do not account for uncertainty. She added that the updated age data will require re-estimation of parameters such as growth and natural mortality. Both steepness and virgin stock recruitment will be estimated by the model. Time-varying retention will be used to account for management changes and their effects. The two fishery-dependent CPUE indices recommended for use are from the headboat fleet (east and west) pre-2008 due to the effects of circle hooks on selectivity and catchability for this species. Also, the SEAMAP summer and fall groundfish trawl (combined) and G-FISHER will be the only fishery-independent surveys considered. Council staff said that the fall plankton survey, which captures mostly juveniles rather than larvae and is not being considered as an indicator of SSB, could still be considered for estimating recruitment. Dr. Sagarese replied that the SEAMAP fall groundfish trawl survey also captures age-0 juveniles after they settle, and a recruitment index can be generated from that, including length composition data. The SEAMAP fall plankton survey does not capture the full scope of juvenile mortality up to settlement on reef habitat.

An SSC member recalled the video survey working paper from the SEDAR 100 Data Workshop (SEDAR100-DW-18) and noted the low number of observations and poor spatial coverage in the western Gulf. The SSC member was apprehensive about combining the G-FISHER data from the eastern and western Gulf due to the large disparity in sample sizes and coverage between regions. The SSC member also identified strong differences between the eastern and western Gulf in terms of estimated biomass from the SEAMAP trawl surveys, with more age-0 and age-1 fish estimated to occur in the western Gulf. Dr. Sagarese acknowledged limited spatial coverage by G-FISHER in the western Gulf, but also noted that fishery-dependent landings in the western Gulf do not reflect the estimated juvenile biomass from the SEAMAP groundfish trawl surveys. SSC members commented on the mismatch between the depths at which red snapper are targeted in the central

and western Gulf (less than 150 feet) and where legal-size (15-inch fork length) gray triggerfish are harvested (greater than 150 feet) and thought it unlikely that anglers targeting red snapper would travel further offshore to harvest the one gray triggerfish per person bag limit.

Dr. Sagarese continued, stating that a true SEDAR 43 continuity run is not possible given major data changes. She discussed the composition data available for SEDAR 100, and commented that despite considerable improvements in methodology, gray triggerfish remain difficult to accurately age. Age-length keys show variable length at age, making length by itself a poor predictor of age. For the data inputs, Dr. Sagarese recommended weighted length compositions and age compositions (conditional age-at-length preferred but nominal if needed), and to input an error matrix accounting for uncertainty in age estimates. In the model, she recommends using length-based selectivity for all fishing fleets, shrimp bycatch, and surveys. She demonstrated the effects of these proposed changes on age-0 recruits, spawning output, and absolute fishing mortality if applied to SEDAR 43 compared to preliminary outputs for SEDAR 100.

An SSC member supported a length-based approach but requested including the age compositions at a zero-weight for model evaluation purposes. Another SSC member expressed concern over use of the pre-1981 recreational data from historical datasets, which are known to be uncertain. An SSC member thought that including historical data could be informative if scaled appropriately.

Dr. Sagarese discussed the spatial construct of the model. Two options are being considered: Gulf-wide, and eastern versus western Gulf. There is not strong evidence to support distinct eastern and western Gulf stocks based on growth rates, length composition, and age composition. Most of the data being considered in the model come from the eastern Gulf and data are limited in the western Gulf, including composition data. In contrast, shrimp effort and bycatch are higher in the western Gulf and Dr. Sagarese hypothesized that bycatch could explain the juvenile gray triggerfish biomass present in western Gulf SEAMAP trawl surveys that do not translate to harvest. However, the Working Group for Shrimp Trawl Bycatch for Finfish Species is going to examine these data further and bring it back to the SSC at a future date. Dr. Sagarese described model effects of collapsing the data into a Gulf-wide single-area model, which showed that overall, time series are similar, and quantities generally remain within or very close to confidence limits.

An SSC member noted that just because age-1+ gray triggerfish are not being observed in directed fleet harvests in the western Gulf does not mean that those fish are not there, and that those juveniles are not all being taken as shrimp trawl bycatch, adding that the species often uses non-trawlable habitat. Others agreed and noted the decreased catchability with circle hooks and the additional fuel required to reach depths where legal-size gray triggerfish are more common. Council staff expressed caution in reliance on SEAMAP trawl data by region, noting very low sample sizes relative to sites sampled Gulf-wide. An SSC member asked about consequences of a Gulf-wide approach, and Dr. Sagarese replied that it was likely that trends in the eastern Gulf would have a greater influence on the stock assessment results. The SSC member said that despite that, they thought using a Gulf-wide, single-area model was the best approach. Other SSC members agreed. Another SSC member noted sexual dimorphism, with males attaining larger sizes at age than females, and said that low sample sizes in the assessment are likely making teasing those sex-specific differences apart difficult. The SSC member also commented on current research to use epigenetic aging from fin clips, which when combined with genomic sexing of fish,

could produce much more accurate ages and sex ratios. Initial work on the epigenetic aging has shown a high degree of precision and agreement with known-age gray triggerfish.

Summarily, the SEFSC recommends using length compositions and incorporating age data as feasible, collapsing fleets-as-areas and using a Gulf-wide, single-area model, and separating commercial longline from commercial vertical line given strong differences in selectivities between those fleets. Dr. Sagarese then scoped out future model building work and sensitivities expected leading up to the Review Workshop, which is planned for August 2026. An SSC member was concerned about the spatial differences between the data available in each survey, and the possible effects combining those data would have on estimations about the stock.

> **The SSC supports the SEFSC moving forward with a one-area, Gulf-wide assessment model for gray triggerfish (SEDAR 100) and using length compositions and incorporating age data as feasible.**
>
> *Motion carried with one in opposition*.

Council staff revisited an issue from the Data Workshop regarding the state-specific landings surveys and their future use for managing gray triggerfish. Dr. Sagarese acknowledged those data issues, but for the purpose of this check-in, stuck to the core issues presented. An SSC member added that further work on the state survey data was expected in the future.

Discussion: Progress on MRIP Pilot Studies

Dr. Richard Cody (NOAA Office of Science and Technology) updated the SSC on the progress made on the MRIP-FES pilot study and reviewed the forecasted timeline for the peer-review of the study and the availability of results. Key findings of the pilot study indicated that differences in effort estimates were most pronounced for the and that private boat mode in low activity waves and that a "bounding effect" helped curb overreporting from respondents who wished to identify as anglers as their primary focus to responding to the mailed questionnaire. As a result, Dr. Cody said that the study also demonstrates the feasibility of monthly sampling under MRIP-FES. The revised survey design was tested in 2024 (including revised question order and monthly sampling) and addresses a primary source of measurement error in the current design, improving the accuracy of effort estimates. The current bimonthly wave estimation procedure was used for 2025, with the monthly approach coming online in 2026. Dr. Cody also noted the realignment of recreational data collection partnerships which was recently announced in early 2026. He added that updated MRIP-FES calibrated landings data are expected in late August 2026. Dr. Cody expects to present an update to the Council at its April 2026 meeting in Mobile, Alabama.

An SSC member asked about directed effort data related to area or depth fished. Dr. Cody replied that work remains outstanding and would come from the Access Point Angler Intercept Survey which conducts dockside surveys of anglers to estimate catch. Another SSC member asked about the number of surveys conducted in the pilot study. Dr. Cody replied that the total sample size is in the upper hundreds to a thousand, with a response rate of approximately 30%. Dr. Cody offered to provide the sample sizes by state if requested. The SSC member followed up asking about recall bias being stated as more prominent in low effort periods, countering that it is easier for survey

participants to recall zero effort versus precisely recalling the number of trips during periods of high effort. Dr. Cody said that generally, anglers want to report their trips, and that there is less tendency to report out of the temporal frame trips during high effort waves. The SSC member then asked about the question ordering effect, and why there was such variability across states. Dr. Cody replied that there may be nuances in reporting between states, relative to both the number of survey respondents within and across waves. Another SSC member highlighted possible management biases by way of fishing season effects. Council staff highlighted the state survey data being collected, and asked how calibrations would be produced for stock assessment purposes. Dr. Cody replied that the current ratio-based calibration approach would likely need to be replaced by a composite approach to use a homogenized data unit across the Gulf region.

Public Comment, February 26

Capt. Bob Zales: Southeastern Fisheries Association

He appreciates the makeup of the panel, their obvious preparation, and the interactions they're having this meeting. He indicates that the start year of gray triggerfish stock assessment data, especially in consideration of overweighted recreational impact, should be moved to somewhere in the mid-1980s. Data from the 1940s is useless and would have come from census data; the data was not useful until the 1980s.

Other Business

SEDAR 94 Hogfish Review Workshop Participants

The Council requested two SSC members to be reviewers for the SEDAR 94 Review Workshop for hogfish. Dr. Steve Saul volunteered, and Council staff will look to the SEDAR Technical Committee for an additional volunteer.

SEDAR 98 Red Snapper Review Workshop Participants

The Council requested an SSC member to be a reviewer for the SEDAR 98 Review Workshop for red snapper. Dr. David Griffith volunteered.

The meeting adjourned at 12:00 pm eastern time on February 26, 2026.

Meeting Participants

Standing SSC
Jason Adriance
Luiz Barbieri
Harry Blanchet
Dave Chagaris
David Griffith
Tiffany Hopper
Jack Isaacs
John Mareska
Paul Mickle
Trevor Moncrief, *Chair*
James Nance
Will Patterson
Dan Petrolia

Sean Powers
Andrew Ropicki
Ralph Townsend
Steve Saul
Steven Scyphers

Special Shrimp SSC

Don Behringer
Konner Lockfield
Jason Saucier

Council Representative
Mike Allen