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

Review of SEDAR 81: Gulf of Mexico Spanish Mackerel
Meeting Summary
July 19 – 20, 2023

Review SEDAR 81: Gulf of Mexico Migratory Group Spanish Mackerel
Operational Assessment

Dr. Lisa Ailloud (Southeast Fisheries Science Center [SEFSC]) presented the findings of the SEDAR 81 Operational Assessment of Gulf of Mexico Migratory Group Spanish Mackerel. SEDAR 81 resolves several concerns from the previous model (SEDAR 28 2014[1]), and incorporates updated recreational landings data calibrated to the Marine Recreational Information Program's Fishing Effort Survey (MRIP-FES). The model start year has been adjusted to 1986 to correspond to the data-rich period of landings data, with the recreational fleet split into its separate components (i.e., private, shore, for-hire). The adjustment of the model start year improved model stability. The terminal year for the model is 2021. The Southeast Area Monitoring and Assessment Program (SEAMAP) trawl index has been split into early and late components by year. Two key corrections were applied to the SEDAR 28 model: the maturity function (proportion mature at age) and the minimum size limit time block. Most of the removals come from the private and shore recreational fleets, with most of the composition data (length and age) coming from the for-hire fleet. The sex ratio remains fixed at 1:1; the weight-length relationship remains unchanged, and the age-length relationship was updated to include 20,000 new otoliths. Using a maximum age of 11 years, internal Lorenzen scaling for natural mortality (M) was used against the Hoenig M estimate of 0.38. Steepness remains fixed at 0.8.

Commercial landings increased over time until gillnetting in Florida was prohibited, after which commercial landings decreased considerably. Commercial vertical line and gillnet landings both follow a similar trend, with the coefficient of variance (CV) about the commercial landings fixed at 0.01, indicating that the commercial landings data are assumed to be known with great precision. Commercial discards were assumed to be zero for the gillnet fleet, and a 10% discard mortality rate assumed for the vertical line fleet. The discard fraction (discards / total landings + discards) for the vertical line fleet was 9% on average.

Overall, the transition to MRIP-FES resulted in higher landing estimates than with MRIP-Coastal Household Telephone System (CHTS). Recreational landings used CVs of 0.1 to 0.5 depending on fleet, indicating variable but comparatively high uncertainty compared to the commercial landings. Data corrections were applied when CVs exceeded 0.5 for a fleet in a year by replacing that value with the mean of the neighboring two years. Recreational landings have generally increased from 1986 – 2019, with a drop in 2020 and 2021. The majority of recreational discards come from the shore mode. Discard mortality is set at 20% for the recreational fleets. Due in large part to the high uncertainty about the recreational discards, sensitivity runs testing 40% and

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[1] https://sedarweb.org/documents/sedar-28-stock-assessment-report-gulf-of-mexico-spanish-mackerel/

60% recreational discard mortality were not influential on model results. Recreational discards were not observed to be constrained to the minimum size limit, with some discards including larger fish. An SSC member asked if the proportion of landings coming from the different recreational fleets was also reflected in SEDAR 28, or if it was a product of changing recreational landings data over to MRIP-FES. Council staff examined the landings from SEDAR 28, and the shore mode landings therein tended to be 10-30% higher than the private recreational landings, albeit following a similar trend. The SSC also asked if the decline in landings during 2020 and 2021 could be a result of COVID-19 pandemic lockdown, but this remained undetermined given that fishing effort increased at the same time.

Shrimp discards were updated relative to fleet effort through 2020. A super period approach was used due to the high uncertainty of the data. Commercial length composition data showed a shift in data coming from the Florida gillnet fleet to Alabama, following the Florida gillnet ban in state waters. Age composition data are conditional on length, with strong cohorts in 1991, 1995, 2001, 2004, 2009, 2015, and 2019. Length composition data for the recreational fleets show similar length composition between the private and for-hire fleets, and smaller fish for the shore mode. Most length samples for the recreational fleets came from the headboats. Similar cohort patterns were detected in the residuals for the recreational fleets as for the commercial fleets.

Catch per unit effort (CPUE) indices were discussed, with the historic recreational index dropped due to a low proportion of successful trips. The commercial vertical line CPUE index increases from 1986 to the mid-2000s, and is relatively flat thereafter.

An SSC member noted the majority of Spanish mackerel landings seem to come from the recreational shore mode, and asked if that trend was also present in SEDAR 28 or if it could be a result of the transition to MRIP-FES.

Another SSC member asked about the weighting of the indices and if these were assigned differently. Dr. Ailloud responded that only the commercial CV were adjusted to match the minimum CV of the fishery independent survey. An automated re-weighting approach was evaluated but it increased uncertainty.

Dr. Siegfried asked what the SSC would like to see about the recreational data, specifically about the CVs for the specific recreational fleets between SEDAR 28 and SEDAR 81. An SSC member asked whether there were consistent or cyclical landings by state, and the number of intercepts that are coming from the shore mode for the states, to determine the degree to which the shore mode landings are plausible. Dr. Siegfried noted that accounting for spatial patterns in landings would not be able to be directly incorporated into the current model framework, but could be considered by the SSC in considering catch limit recommendations and reflected in the uncertainty. The SSC member thought it interesting that shore mode would become such a dominant source of landings compared to the last assessment. Another SSC member recalled the shore mode landings from gray snapper (SEDAR 75 2023), and the volatility of those landings therein.

Fits to commercial landings were precise (CV = 0.01), with more uncertainty about fits to recreational landings, and especially shore mode landings. The commercial gillnet fleet selected for smaller fish than the commercial vertical line fleet. Recreational private and for-hire

selectivities were similar, with the shore mode knife-edged at the minimum size limit. The SEAMAP surveys selected for the smallest fish. The predicted mean age landed by fleet was 3-4 years for gillnet; 2 years for handline in the early part of the fishing season, and 4 years for late; 2-3 years for the for-hire and private vessels, and 2 years for the shore mode. Recreational discards generally fit within the annual CVs, as did fits to fishery-independent indices (CPUE, SEAMAP). SEDAR 81 estimated a more gradual decline in discard ages than SEDAR 28, with more of the discard age composition consisting of older fish compared to SEDAR 28. Overall, shrimp discards account for a small fraction of the total removals, especially compared to the recreational private and shore modes. Recruitment deviations are cyclical about the mean. Exploitation by the shore mode has increased substantially since 2011, while the effect of shrimp bycatch has become considerably less influential with time (the latter in contrast to that estimated by SEDAR 28). Commercial exploitation is a small fraction of recreational exploitation. By comparison, SEDAR 81 shows a smaller fraction of unfished biomass compared to SEDAR 28.

An SSC member asked about the lag between recruitment events and spikes in the shore mode landings. The SSC member and Council staff noted a mismatch between recruitment events and these spikes, calling into question the shore mode data and whether there was a regional effect or something else related to MRIP shore sampling. The SSC member also noted the poorer fits and differences in fits between the early and late SEAMAP indices. Dr. Ailloud replied that the data from the SEAMAP indices were sparse, and thus poorer fits, given the CVs, were not unexpected there. Another SSC member thought that there has been a change in the fishery since 2010; whereas the recreational fishery was previously balanced between the shore and private vessel modes, it now appears that the shore mode has grown dramatically by comparison since 2010. Combined with the previously noted effect of effort extrapolation by MRIP-FES for shore mode for other species, the signal from shore mode merits further investigation.

Dr. Ailloud described model diagnostics, which demonstrated a relatively well-behaved base model. Retrospective analyses did not show any patterned change in the terminal year estimate of stock condition. The jack-knife analysis showed sensitivity to the SEAMAP indices (shifts estimate higher) and commercial vertical line data (shifts biomass lower), with the base model (which includes both) splitting the difference. A hindcasting cross-validation analysis showed that neither the commercial vertical line CPUE, nor the SEAMAP larval "late" index, are a good predictor of stock biomass. An SSC member did not expect great fits to the fishery-independent data, especially given the flat trend, but was curious about the deviations in that analysis. Dr. Ailloud hypothesized a driver in the length composition data or elsewhere, but that more investigation was needed. She added that even SEDAR 28 noted the unreliable nature of these two indices, and that they essentially cancel each other out in the base model. Another SSC member asked about the absence of the increasing pattern in spawning stock biomass (SSB) from SEDAR 28 in SEDAR 81. Dr. Ailloud thought the signal in SEDAR 28 was being driven by the recreational data therein (MRFSS), which disappears in the new MRIP data in SEDAR 81. An SSC member asked about the state-specific landings data, and whether those data had been considered. Dr. Ailloud noted many gear changes to the gillnet fleet over time by state, which confounded those data to some degree. Also, the vertical line index is based only on positive trips, and the response variable is the number of fish per trip, which doesn't account for trip duration. She thought these indices could be improved in future iterations, as could spatiotemporal evaluations of the SEAMAP indices.

Dr. Ailloud showed the profiling of steepness, which due to no defined stock recruit relationship, was relatively flat. Allowing steepness to be estimated resulted in a value of 0.85, and scaling steepness up or down concurrently scales SSB up and down. The model is sensitive to the estimate of M, with the sensitivity run of M=0.49 resulting in a near doubling of the unfished biomass compared to M=0.38 (base model estimate). An SSC member asked whether it would be more appropriate to apply the Hamel and Cope (2022[2]) approach to M in future assessments. Dr. Ailloud replied that the combination of the larger data set and the more statistically appropriate approach in Hamel and Cope was worth investigating compared to previous approaches, as it was less sensitive to bias related to max age.

Dr. Ailloud reviewed the differences in estimates from MRIP-CHTS in SEDAR 28 and MRIP-FES in the same model, which showed an increase in the difference in the projected overfishing limit (OFL) at a fishing mortality rate corresponding to a 30% spawning potential ratio ($F_{30\%SPR}$) from a 20% increase using MRIP-FES in 2013 to a 39% increase in 2019. Projections use the average relative fishing mortality, selectivity, and retention from 2019 – 2021, and recruitment is model-derived. Interim landings use the actual landings data for 2022, and a three-year average of 2020 – 2022 for 2023 and 2024. Shrimp bycatch is fixed at 0.06, and no sector allocations are used. As of 2021, Gulf Spanish mackerel is not overfished (SSB_{2021} is greater than the minimum stock size threshold [1.34; or, greater than 1], but SSB_{2021} is below SSB at MSY), and is not experiencing overfishing (F2019-2021 is less than the maximum fishing mortality threshold [0.93; or, less than 1]). The stock may have been overfished prior to 2000 and briefly in the 2010s, and overfishing may have been occurring in the 1990s and 2010s.

Fisherman Feedback

Council staff presented the results from the Council's stakeholder engagement tool to capture perceptions about the current status of a stock. A total of 117 responses were gathered from April 14 – May 19, 2023. The majority of the respondents were from the private recreational sector, and the majority of the answers came from Pensacola, Florida and Alabama area. Over 50% of the comments received were negative in nature, followed by neutral comments. Staff noted a spatial trend with comments being more negative in the eastern versus western Gulf. An SSC member asked if the recreational data could be separated into shore versus private vessel. Staff responded that question was not included, but that the assumption is that the majority of recreational respondents are offshore fishing. Staff also noted that among the negative sentiment, there were concerns about stock decline, shark depredation, and reduction of forage species.

An SSC member encouraged staff to use a randomized sampling method and not allow the participants to self-select a sector to see if the results are the same. Staff commented that it would be a good idea, but that there are limitations on how to use the tool due to the Paperwork Reduction Act.

An SSC member asked about the maximum sustainable yield (MSY) value corresponding to the fixed steepness value of 0.8. Dr. Ailloud said she could provide that value later in the meeting.

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[2] https://www.sciencedirect.com/science/article/abs/pii/S0165783622002703?via%3Dihub

The SSC member noted similar challenges for SEDAR 81 as in SEDAR 28, with regard to estimating reproduction, landings, and with fishery-independent indices. They added that for some species, it may be necessary to manage expectations with regard to the quality and quantity of data which may be available for some species. Another SSC member asked about concurrent assessments between the Gulf and Atlantic migratory groups. Council staff described the boundaries between the migratory stocks, and noted that the migratory groups do not need to be assessed concurrently. An SSC member from Texas discussed data that indicate Texan anglers are not targeting Spanish mackerel as much as in past years. Another SSC member noted the decline, and the large difference between the annual catch limit (ACL) and the landings for Spanish mackerel. The SSC member asked about the comments heard at Council meetings, and whether they indicated a trend. Council staff recalled the negative impression of the stock by a majority of respondents to the Fisherman Feedback tool, as well as negative comments received about king and Spanish mackerel during public testimony. An SSC member commented on the mismatch between perceived cohorts coming into the fishery and the spikes in the shore mode landings. Another SSC member recalled recorded examples of expansion and contraction of Spanish mackerel in response to environmental drivers, which weren't available to be included in this stock assessment. They added that there were substantial data limitations for SEDAR 81, and that recommendations should be made with that fact in mind. Council staff commented that it was unlikely that an interim analysis would be possible for Spanish mackerel, given the reliability of the indices.

> **Motion: The SSC accepts the SEDAR 81 Gulf of Mexico Spanish Mackerel Operational Assessment as consistent with the best scientific information available. Under the current MSY proxy of $F_{30\%SPR}$, the assessment indicates the stock is not overfished and not overfishing as of 2021.**
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> *Motion carried without opposition.*

Discussion: SEDAR 81 Evaluation and Projections

Dr. Ailloud noted that the interim years assume the actual landings data for 2022, and a three-year average of 2020 – 2022 for 2023 and 2024. This is because modifications to fisheries management resulting from SEDAR 81 are not expected until 2025. An SSC member thought it might be appropriate to consider a 6-year average for 2023 and 2024 instead of a three-year period. SSC members thought the issue might be that because MRIP is a general survey covering many species, it is unlikely to be specific to any single species. It may be that Spanish mackerel is not well-covered by MRIP, as evidenced in the CVs for the recreational data and the lack of composition data coming from those landings. However, by incorporating the new MRIP-FES estimates, the productivity of the stock is also projected to have increased with the landings. Some SSC members continued to express concern that there was, and historically had been, such a large difference between the ACL and the landings. An SSC member asked about the source of the surplus production in the fishery resulting in such large catch limits, especially since rapid increases in biomass are not evident. Dr. Siegfried demonstrated the stock's performance against MSST and MFMT, noting that instances of overfishing did not always lead to the stock having been historically overfished. Some SSC members thought the productivity of the stock may be overestimated. An SSC member thought recreational discards may be contributing; although,

discards were noted to be poorly estimated. Another SSC member thought the SSC could denote to the Council the issues within the assessment and its concerns about those issues, and encourage the Council to be considerate of that when evaluating how to revise the ACL for Spanish mackerel.

Council staff said that the behavior of the Kobe plot was peculiar, because in the initial year (1986) the stock was undergoing overfishing, and continued to be for several years, during which the biomass seemed to continue to increase. This seems counterintuitive. Dr. Siegfried replied that it may be that those removals were focused on the less fecund portion of the biomass. An SSC member suggested using either a three-year average of 2017 – 2019 for the interim years, or a six-year average using 2017 – 2022. This would result in a modification to the projected catch limits by increasing the assumed landings in the interim years. In support of the modified three-year period, the SSC member stated that the landings were depressed despite increased effort, and without an ability to describe why, it may be appropriate to exclude those data from informing the projections in this way.

> **Motion: The SSC recommends using the mean of the landings from 2017 – 2019 as the proxy for the interim projection years of 2023 and 2024.**
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> *Motion carried 9 – 4, with 4 abstentions and 7 absent.*

Discussion: SEDAR 81 Evaluation and Projections (continued)

Dr. Ailloud reviewed updated projections based on the previous SSC motion. She also noted that the predicted F_{MSY} based on model settings was at 29% SPR; thus, using a proxy of $F_{30\%SPR}$ was just slightly more conservative. The new OFL projections trend down towards the SSB_{MSY} target, and the Acceptable Biological Catch (ABC) trends up towards the F_{MSY} target. The SSC asked why the OFL is represented by a declining yield stream, and the ABC an increasing one. Dr. Ailloud replied that it is because the SSB is projected to be slightly below the SSB_{MSY} in 2022, and because the projected harvest in the 2023 and 2024 interim years is below that which would deplete the stock compared to the ABC.

> **Motion: The SSC sets the OFL for Gulf Spanish mackerel based on SEDAR 81 and the revised projections, using a constant catch of 12.074 mp ww for 2025 – 2027.**
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> *Motion carried without opposition and with one abstention.*
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> **Motion: The SSC sets the ABC for Gulf Spanish mackerel based on the SEDAR 81 revised projections, using the yield at 75% of $F_{30\%SPR}$. The constant catch for 2025 – 2027 is 9.630 mp ww.**
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> *Motion carried without opposition and with one abstention.*

Meeting Participants

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

David Chagaris
Doug Gregory
David Griffith
Paul Mickle
Trevor Moncrief
Will Patterson
Dan Petrolia
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
Kevin Anson

[A list of all meeting participants can be viewed here.](#)