Center for Independent Experts (CIE) Independent Peer Review of the South Atlantic Grey Triggerfish Assessment (SEDAR 82)

Larry D. Jacobson

CIE Reviewer

July 2024

Executive Summary

I helped review a Southeast Data, Assessment, and Review (SEDAR-82) "Research Track" assessment for grey triggerfish (GTF). The subject GTF stock and fisheries are in state waters and the U.S. Exclusive Economic Zone along the southeastern United States. SEDAR is a cooperative process for reviewing fisheries stock assessments in the National Oceanic and Atmospheric Administration (NOAA) Fisheries Southeast Region. The Mid-Atlantic Fishery Management Council (MAFMC, https://www.mafmc.org/) along with state and federal authorities manage commercial and recreational fishing for GTF.

Research track assessments focus on improving methods and data. Results are not used operationally to provide management advice. I was told that the SEDAR-82 assessment for GTF was on the research track because of problems with age data detected late during review of a previous assessment.

Based on the Assessment Report, Data Meeting Report and Review Discussions, the SEDAR-82 research track process for GTF successfully improved data and modeling approaches. The Review Panel (RP) unanimously agreed that the data and modeling approach were appropriate and sound. In other words, we agreed that they were likely to constitute an adequate basis for providing management advice for GTF in the next operational assessment. As in any rigorous scientific review, the RP made suggestions for improving the modeling and data that should be considered and potentially incorporated in the next assessment without interim review. A few longer term research recommendations were provided as well.

Background and Summary of Role

The Center for Independent Experts (CIE) contracted me to help review the SEDAR-82 GTF Research Track Stock Assessment. The review was conducted at a meeting held 11-14 March 2024, in Atlantic Beach, NC. Data for GTF were current through 2021 and not updated through 2024 as would be needed in an operational assessment meant to provide management advice.

Nikolai Klibansky (assessment lead) and Eric Williams (NOAA fisheries, Southeast Fisheries Science Center, NEFSC) presented the assessment report. The Review Panel (RP) consisted of Marcel Reichert (Chair – South Atlantic Fishery Management Council, Scientific and Statistical Committee, SAFMC SSC), Anne Markwith (SAFMC SSC), Alexei Sharov (SAFMC SSC), Steven Holmes (CIE), Mark Dickey-Collas (CIE), and me (Larry Jacobson, CIE). Other SEDAR, SAFMC, NOAA employees and one SAFMC Council Member also attended and provided other information. Most participants were present in the room for the entire public meeting and proceedings were broadcast and taped.

The meeting was collegial, efficient, and seemed to focus on technical questions and scientific matters. The stock assessment team lead by Dr. Klibansky was helpful and provided clear explanations. The documentation was clear and complete.

There were two key documents in the review. The complete draft stock assessment report circulated before the meeting was most important. A Data Workshop report that summarized extensive discussions and recommendations from earlier data workshops was available and mentioned in discussions. Links to many working papers from the Data Meeting were provided but the working papers were not, based on my recollection, discussed.

A draft consensus summary report was compiled at the meeting and finished afterwards by correspondence. CIE reviewers are required to prepare individual independent reports, such as this one, to supplement the RP's summary. The independent reports should describe any differences of opinion and highlight any topics in the consensus summary that need elaboration. However, the RP agreed on the overall conclusion and on almost all individual topics for GTF. My comments here include a few topics not mentioned in discussions.

This consensus summary report should be read prior to reading this reviewer's report.

Findings, Conclusions and Recommendations by Term of Referenced (TOR)

The RP, including myself, agreed that the data and modeling approach were appropriate, sound and could be used to provide the best available scientific information. In other words, we agreed that they were likely to constitute an adequate basis for providing management advice for GTF in the next operational assessment. As would be the case in any rigorous scientific review, the RP made suggestions for improving the modeling and data that should be considered and potentially incorporated in the next assessment. The suggested work can be reviewed along with the rest of the next operational assessment.

The areas for potential improvement and future work are mentioned below. Most can be viewed as short-term research recommendations or ideas for consideration that could be addressed in time for the next operational assessment. Most are also mentioned in the Review Summary Report. I will try to identify any points not also covered in the Summary Report.

ToR 1. Evaluate the data used in the assessment. Consider the following:

   a) *Are data decisions made by the DW and AW justified?*
   b) *Are data uncertainties acknowledged, reported, and properly characterized?*
   c) *For model derived data and parameter inputs (e.g. indices of abundance, life history quantities) are the methods appropriate?*

The data used in the assessment were sufficient to conduct the stock assessment. In general, data decisions were justified, acknowledged appropriately, and parameter inputs were appropriate. The following comments and suggestions for further improvements to the data should be considered.

- The current model used ages 1 to 5+ yr up to 1994 and 1 to 8+ yr afterwards because of changes in ageing techniques (all ages from dorsal spine sections). This is an appropriate approach under the circumstances and could be used in the next assessment.
- The RP endorsed a proposal to re-age pre-1995 spine collections using an updated technique so that ages up to 8+ yr can be used in all years. Otoliths are the best material for ageing GTF (accurate to age 12 yr) but not in production work because of the difficulty and time required. Better historical age data would improve the assessment by making mortality and recruitment estimates more accurate. Some changes to model configuration may be needed, depending on results. This is a key area for immediate research. Hopefully, updated age data will be available in time for the next assessment.
- The model used an age-error matrix to account for ageing errors, which are substantial in GTF at most ages (e.g. 65% of ages correct at true age 3 and 28% correct at true age 7 based on the age-error matrix). This age-error matrix is an appropriate way to deal with uncertainty in age data.
- The age-error matrix is apparently based on a single large set of dorsal spines read by multiple age readers. The comparative reader study could be updated at intervals to make the matrix as accurate as possible and to help with quality control for ageing.
- Consider using otolith ages, which provide the most accurate age-readings, for estimating age error matrices, estimating growth curves, etc.
- Decisions to omit fishery dependent CPUE indices should be better justified or reconsidered. CPUE data suffer from well-known problems and are not ideal. Searching behavior, regulations and improvements to gear such as vessels, fishing equipment and electronics all complicate interpretation of CPUE and generally keep CPUE trends high as abundance declines. However, the fishery CPUE data for GTF showed the same trends and interannual variability as the trap survey data. Surveys are sometimes missing data (e.g. SERFIS in 2020 due to covid) or show unexpected variability. Assessments based on multiple indices may be more robust to interruptions in the survey program and noise in single surveys as long as the fishery CPUE data are standardized and modeled correctly using parameters to represent nonlinear effects. Fishery CPUE should be included in a sensitivity analysis next time, if only to estimate nonlinearity parameters. If nothing else, the fishery CPUE data should be considered qualitatively because consistent declines in multiple CPUE indices (which are smoother but decline more slowly than survey trends or

abundance) are usually clear to constituents and can be strong evidence for a decline in the stock.

- Male and female GTF grow at different rates. In a perfect world, all catch, survey, other data and modeling would be separate by sex. More data on sex differences would be useful in the long term but it is not practical to model sexes separately in the next assessment.

- Catch data before and during the early 1980s were likely biased low based on the Data Workshop Report and comments at the assessment review. Discards may not have been completely recorded because GTF were not targeted, are common as bycatch and discard mortality rates are high (about 60%). More and better information about historical landings, discard and effort in the multispecies fishery would be helpful. Perhaps the most useful question to ask for sensitivity analyses is "how much missing catch or discard would be required to substantially affect the assessment and is that quantity of missing catch possible?". This is a key area for research prior to the next assessment.

- Natural mortality at age estimates were scaled based on age data from a single old fish which may be uncertain or not representative of maximum age in the stock. This approach should be reconsidered in the next assessment or data workshop. A variety of well-known approaches can be considered. One that does not rely on a single specimen may be better.

- A map of survey catches seemed to show relatively high catches along the deep boundary of the survey area and this implies that the fish are found in deeper water than covered by the survey. How much biomass is in water too deep for the survey to reach? I did not make this point at the review.

- Survey trap saturation is not considered as completely as it should be in the current assessment. Saturation occurs when increasing or decreasing numbers of fish inhibit proportional changes in catch rates so that survey and stock trends diverge. Typically, the stock declines faster than the survey trend. I agree that there was little evidence of saturation problems (but see below). Short soak times are used in the survey to avoid saturation. However, it would be almost impossible to detect saturation in the assessment without a second survey using different gear. The evidence for potential saturation includes a study by Bacheler et al. (2013) that found saturation effects for black seabass in the trap survey also used for GTF (ICES J. Mar. Sci. 2013. 70: 873–882). Video shown by a reviewer at the meeting seemed to show inter- and intraspecies interactions around the traps that must have affected catch rates. Finally, the theoretical basis for simple linear relationships between survey catch and stock size is clear for mobile gear and randomly distributed fish but is not clear for fish aggregated around and caught in relatively small traps. A trap saturation study should be conducted for GTF and probably other species, at the

first opportunity. At minimum, sensitivity analysis should be used in the next assessment to determine the possible effects of trap saturation.

ToR 2. Evaluate and discuss the strengths and weaknesses of the methods used to assess the stock, taking into account the available data. Consider the following:

a) *Are the methods appropriate for the available data?*
b) *Are assessment models configured properly and used in a manner consistent with standard practices?*
c) *Were modeling issues clearly identified and addressed? If not, recommend potential methods for addressing these issues.*

The assessment used the Beaufort Assessment Model (BAM) which is a modern and tested computer program used for many species in the Southeast Region. The model is a statistical catch-at-age approach like models used elsewhere. It handled all data available for GTF in a natural and appropriate way. The model was configured correctly and used in a manner consistent with modern practices. It struck a reasonable balance between parsimony and an overly detailed depiction of GTF population dynamics (the level of detail was consistent with the data available). It converged well in the base-case and sensitivity runs, without retrospective patterns. It was stable in terms of trends and relatively stable in terms of scale in sensitivity runs.

The RP and I made the following suggestions for potentially improving the assessment.

- The model used a single age-error matrix for ages 1-4+ before 1995 as well as for ages 1-8+ in later years, even though the ageing methods changed in 1995. Separate age error matrices might be required for the two time periods if the change in methods affected accuracy for ages 1-4. I did not raise this point at the review.
- The growth curves used in modeling appear (?) to be based on spine ages and were fit outside the assessment model and assume that the ages were accurate. If so, the growth curves used in modeling were flattened and smeared to some extent due to errors-in-variables (errors in the age used to predict length) so that growth rates for young fish are exaggerated. What are the effects of the ageing error in growth curve estimation on the assessment, status determination and reference points? Can the external modeling be modified somehow to account for the age errors? Can otolith ages be used instead of spine ages for growth modeling? Would it better to fit the growth curves in the assessment model in a way that accounts automatically for ageing error? I did not make this point at the review.
- It would be useful to routinely include projections in retrospective analysis to figure out if projections are stable and accurate relative to eventual model estimates for future years. This is a key area for research.

- The next assessment should include a likelihood profile analysis that up- and down-weights different important sources of data to determine how each data source supports different hypotheses about the stock. For example, in the assessment for GTF, biomass estimates were relatively robust to the weight placed on the survey data though the composition data seemed to indicate a steeper decline trend than the survey (but see below). This is an important area for research.
- The SEFSC might be able to develop a set of useful profile analyses and plots for results that could be automated and included in all BAM assessments. An assessment TOR should include likelihood profile analysis. I did not make this point at the review.
- I was happy to learn about a relatively new reweighting approach for composition data in BAM based on the Dirichlet distributions, which was used to good effect for GTF. It balances the weight placed on various data sources and reduces subjective decisions about data weights. However, it does not provide information about data consistency and agreement. Likelihood profiles or some other analyses are needed to really understand the data driving results and conclusions from modeling. I did not make this point at the review.

ToR 3. Consider how uncertainties in the assessment are addressed.

a) *Comment on the degree to which methods used to evaluate uncertainty reflect and capture the significant sources of uncertainty in the input data.*
b) *Comment on sources of uncertainty not accounted for and possible approaches for incorporating these sources into future assessments (e.g. ecosystem, management policies).*

A nice automatic procedure that bootstraps residuals and draws from distributions for assumed parameters was used to estimate uncertainty in the GTF assessment. Sensitivity and likelihood profile analyses were completed prior to and during the meeting. These are standard and suitable ways to estimate uncertainty in assessment results. Some remaining sources of uncertainty are mentioned below.

- Future assessments should more carefully consider potential effects of missing historical catch data on estimated stock trends and minimum stock size threshold reference points that are often based on unfished stock assumptions. The assessment included a sensitivity analysis for initial equilibrium fishing mortality used to start the model in 1980. However, substantial catch may have been missing afterwards during the next one or two decades. The scope for this potentially missing catch data should be evaluated and sensitivity analyses with missing catch data after 1980 included (added to the reported catch), particularly if substantial

catch may be missing and the proportion of total catch not recorded changed over time. I did not make this point at the review.

- Catch was assumed known with little error, which was probably necessary to stabilize the model but unfortunate given the problems described above. It would be good to incorporate a sensitivity run in the next assessment that allows larger errors in catch to see if the residuals suggest early catch data are too small. This idea was not discussed at the meeting.

- Assumptions about stock structure should be better justified. In particular, GTF beyond the northern SAFMC boundary, particularly during the summer, were omitted. This is not a high priority for me, but other reviewers felt differently. I don't think it is necessary to define stock boundaries based primarily on genetic studies or even population boundaries because stocks are artificial entities used for many purposes and there are practical trade-offs to consider in defining management boundaries.

- All reviewers, including myself, viewed the SERFIS survey as an important source of very useful information about GTF stock trends. It would probably be possible to manage the stock biomass based on the survey data alone.

- Differences between the survey trend and the steeper declining trend in model estimated "SSB" (usually spawning stock biomass) were discussed extensively as evidence for a problem in the assessment (Figure 1). However, the RP realized after its meeting that egg production was plotted instead of SSB (the assessment report consistently uses SSB as a label for egg production). Moreover, I plotted total biomass estimates with survey data and noted similar trends indicating that the model and survey were in agreement (Figure 2). The RP supports use of egg production for management of GTF but, in the next assessment, it would be better to avoid confusion by labeling egg production correctly in tables and figures. This topic is not covered completely in the Review Summary Report.

- Different trends in survey data and estimated egg production estimates are not evidence of poor model performance because trends in stock size and egg production will differ due to fishing pressure on large mature fish, particularly if fishing pressure or selectivity changes over time and in batch spawners like GTF. Commercial and recreational fisheries for grey triggerfish have shifted towards larger fish in recent years with a disproportionate and increasing impact on egg production. Removal of large fish reduces egg production faster than might be expected for GTF because maturity increases with size and because grey triggerfish are batch spawners with highest batch fecundity and numbers of spawning events per year for large fish. Thus, the changes in fishery selectivity and fishing pressure reduced average fecundity per fish and modified the relationship between the survey and total population fecundity (Figure 3).
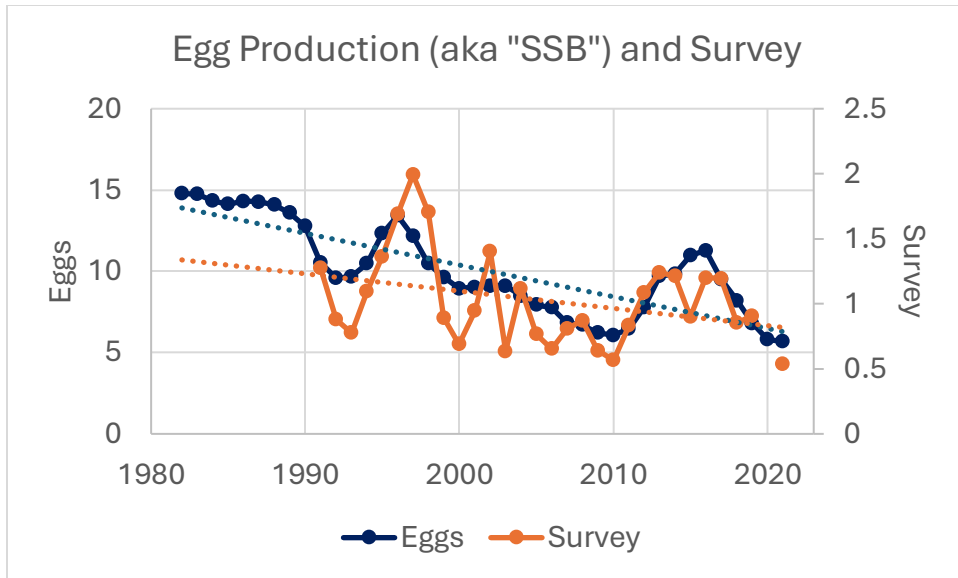
Figure 1: Trends in survey abundance and estimated egg production for GTF with linear regression lines to show trends.
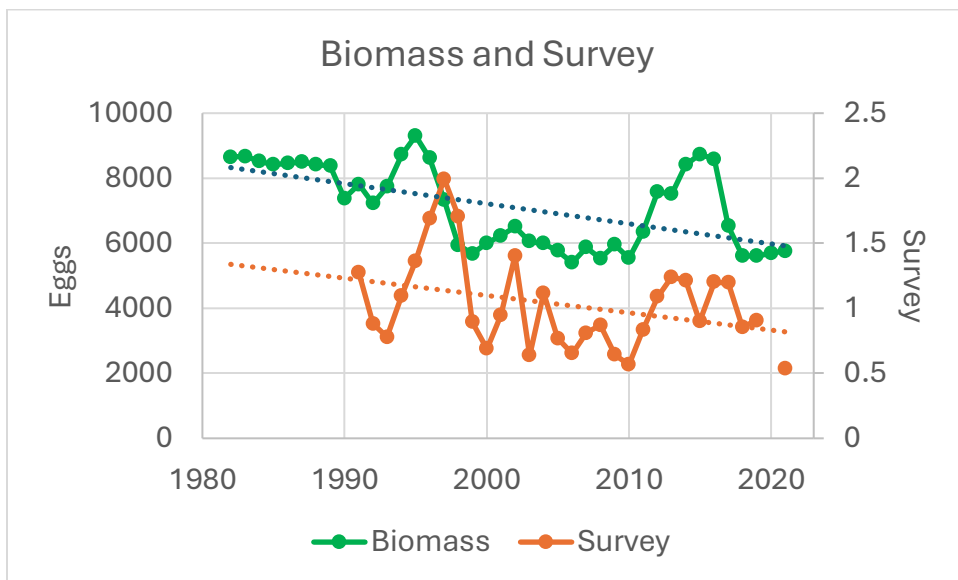

Figure 2: Trends in survey abundance and estimated total biomass for GTF with linear regression lines to show trends.
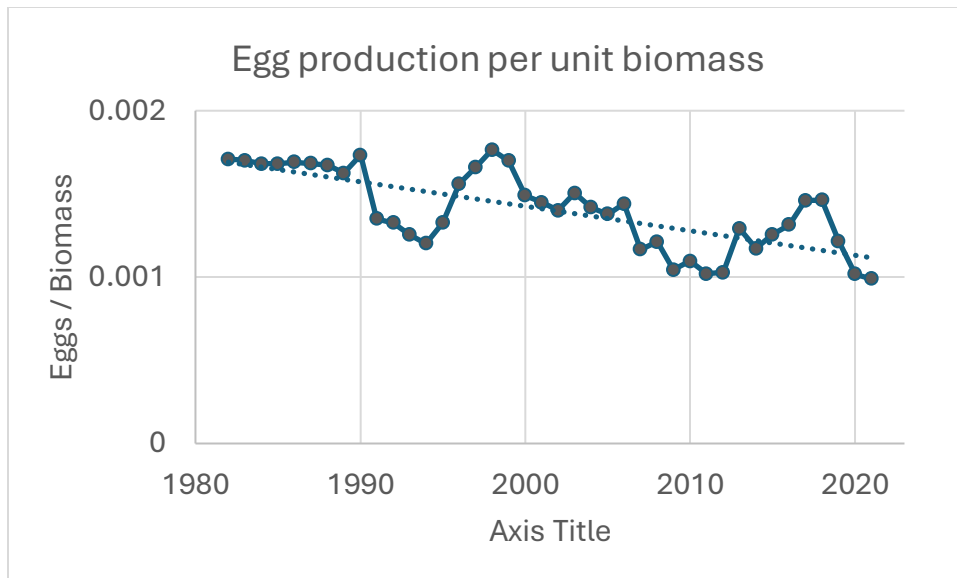
Figure 3: Trends in egg production per unit biomass in GTF with linear regression to show the trend.

- The assessment modeling assumed a constant average level of recruitment over time without estimating a steepness parameter that describes the inevitable decline in reproduction when stock size is low. The assumption was justifiable for GTF in this assessment because the steepness parameter was not estimable and no other information was available. However, the model may tend to overestimate stock productivity if biomass continues to decline and other approaches for estimating recruitment (e.g., based on estimates for other stocks or life history information) should be considered in the next assessment. An "educated guess" might be preferred to an unlikely assumption (constant mean recruitment), particularly if the stock declines. This is an important area for research.

- Average recruitment was assumed in modeling and projections whenever interannual variation in recruitment could not be estimated for lack of information (i.e., during the most recent three years). This reduces variance in calculations but biases stock estimates high when biomass is low and vice-versa. Other estimates of recent recruitment should be considered in the next assessment to accommodate periods of relatively high and low productivity. Recruitment estimates appear autocorrelated suggesting that recent years may be the best time frame for averaging recruitment. This is an important area for research.

- One effect of using egg production instead of female spawning biomass to estimate reproductive output is that larger and older GTF are calculated to make a proportionally larger contribution to spawning than originally calculated based on spawning biomass. This may change relationships among reference points based on per-recruit modeling (see below). In particular, the exploitation rate at F40% will be higher than expected and MSST40 will be lower because fewer old fish are required to generate a given level of egg production. It is even possible that F40%

10

will exceed Fmax and depress yield to some extent or require high levels of fishing effort to achieve. There may be consequences for minimum size limit management measures such as the 12 inch minimum size limit for GTF and any other management measures that intensify mortality of large fish. These relationships for GTF should be better documented and possibly considered in providing management advice in the next assessment. This is an important area for research. These ideas were not discussed at the meeting.

- Stock size reference points in this assessment were based on egg production which was calculated separately for females in each age group based on age specific maturity, batch fecundity and spawning frequency. This is a suitable approach for GTF, but additional data would potentially improve the estimates, particularly since the effects of fishing mortality on GTF egg production are pronounced.

- Selectivity decisions were reasonable. I hope it will be possible next time to explore models with temporal trends in selectivity given that large fish were probably targeted to a greater extent in recent decades. This idea was not discussed at the meeting.

- The stability of the model was remarkable given the "one-way trip" population dynamics (single increasing or declining trend in abundance). Such models tend to be unstable with a lot of uncertainty about the overall size of the stock. The surprising level of stability was not completely explained and I wish we had been able understand it thoroughly. The assumptions that catch data were accurate and that recruitment varied around a constant mean are probably part of the explanation. Catch trends, age composition and survey data may have been unusually consistent; we saw some evidence of this when comparing catch and survey data to estimated year classes. It may be that having just one survey masked uncertainty about the underlying stock that would have been clearer with more survey data. There was no evidence of problems in this assessment, but the model should be checked carefully in the next assessment for overly tight priors and other unintended constraints that might exaggerate stability. These ideas were not discussed at the meeting.

ToR 4. Provide, or comment on, recommendations to improve the assessment

a) *Consider the research recommendations provided by the Data and Assessment workshops in the context of overall improvement to the assessment, and make any additional research recommendations warranted.*

b) *If applicable, provide recommendations for improvement or for addressing any inadequacies identified in the data or assessment modeling. These recommendations should be described in sufficient detail for application, and should be practical for short-term implementation (e.g., achievable within ~6*

months). Longer-term recommendations should instead be listed as research recommendations above.

- A draft "SECTION IV: Research Recommendations" document was circulated prior to the start of the Review Meeting by SEDAR staff. I am unable to comment on many of these recommendations because they are outside my area of expertise (stock assessment) and because of my limited experience with GTF and the Southeast Region. Research recommendations are covered more completely in the Review Summary Report with substantial input from persons familiar with regional conditions. Interested readers should see the RP's Review Summary Report.
- I do agree that "Periodic inter-agency ageing workshops to ensure continued precision and accuracy for gray triggerfish age products" are important (under *Section 1.1 Age Validation* in the list circulated prior to the meeting). The workshops should include ageing from otoliths as well as spines to collect data for improving growth curves and other biological parameter estimates (e.g., natural mortality rates). This suggestion was not discussed by the RP or mentioned elsewhere in its report.
- My comments in this report (presented above) were cast as short-term research recommendations aimed at improving the TGF assessment. For the reader's convenience, they are summarized below:
    o Re-age historical spines.
    o Determine the need for two age-error matrices, particularly, if the historical spines are not re-aged.
    o Update the age error matrix periodically.
    o Consider using otolith ages in updating the age error matrix, estimating growth curves, etc.
    o Justify or reconsider omission of CPUE data. Include CPUE in a sensitivity analysis. Use CPUE data qualitatively to potentially confirm declines in abundance.
    o Use sensitivity analysis to determine how much missing historical catch would be required to materially affect results and estimates of recent status. Is such a level a possibility?
    o Reconsider the assumptions for rescaling natural mortality at age. Use data for more than one fish, if possible.
    o Evaluate the possibility of GTF in water deeper than covered by the trap survey.
    o A trap saturation study should be conducted for GTF, and probably other species, at the first opportunity. At minimum, sensitivity analysis should be used in the next assessment to determine the possible effects of trap saturation.

- Determine if separate age error matrices are required before and after 1995 when ageing procedures changed.
- Adjust external growth curve estimates for errors in variables (imprecise ages) if necessary and possible.
- Include projections in retrospective analysis.
- Augment and possibly automate standardized likelihood profile analyses to evaluate data consistency.
- Examine a sensitivity run that allows for more errors in catch data. See if residuals suggest any temporal patterns in the accuracy of catch data.
- Justify assumptions about stock structure.
- Label egg production as egg production instead of SSB (normally used for spawning stock biomass) in tables and figures to avoid confusion. Egg production is the preferred variable for determining stock status in GTF but calculate SSB in terms of weight also for comparison to other stocks.
- Find a plausible steepness parameter estimate to use in the model. Stock size is declining as fishing pressure increases and steepness is likely to become important over the next decade or so. Use an estimate from another species, other species with similar life history or an educated guess.
- Make more realistic assumptions about recruitment in initial, final and projection years, if possible, and recognizing any autocorrelation in recruitment estimates from the model.
- Effects of egg production calculations on per-recruit based reference points for GTF should be evaluated and considered in applying proxies like F40% and in formulating harvest policy. Does F40% based on egg production exceed Fmax based on yield? That is, would an F40% policy cause growth overfishing?
- Improve age specific reproductive parameter estimates because the calculations have substantial effects on the assessment and potentially on harvest policy.
- In the next assessment, consider runs with more temporal variability in fishery selectivity parameters to potentially model changes in markets and angler preferences.
- Explain the surprising stability of model estimates in the sensitivity runs and other tests.

ToR 5. Provide recommendations on possible ways to improve the Research Track Assessment process.

- We were told that the SEDAR 82 for GTF is likely to be the last Research Track Assessment because of the additional time and resources required to improve data and modeling without providing management advice. I think that the SEDAR 82 GTF

assessment could have been used to provide management advice if recent data had been included. However, in my experience, it can be helpful to focus on data or methods for very difficult or controversial problems, with the results reviewed separately before they are used operationally to determine if a stock is overfished or if overfishing is occurring. The best approach might be to reduce the frequency of research track assessments without eliminating the option entirely.

Critique of Review Process

- The presentations and main review document focused on modeling given the data characteristics (e.g., age reader difficulties, possible missing catch data, etc.) described by the presenters with limited reference to the Data Meeting Report and particularly the Data Meeting background papers. I read the Assessment and Data Meeting reports but not the large number of data background papers. Reviewers asked questions about data where it seemed necessary to understand the modeling. The organizers were probably hoping for more data review.
- Paraphrasing the Review Report, it may be helpful to:
    - Clearly separate the presentation of the data and the assessment model in the agenda and presentations to allow more opportunity to discuss the data before the start of the assessment model presentation.
    - Reduce the total volume of documents or, at least, specify which documents are provided only as optional background for extra information.
    - Identify a person at the workshop who can answer data questions and possibly handle a separate presentation for data.
- In retrospect, more attention to the data was warranted and would have improved my review.
- Successful or not, I would have read the last assessment and review reports for GTF and likely found them useful. They are probably on the SEDAR website, but I was not familiar with the organization of the site when the review started. The links or PDFs could be provided at the same level as the data and assessment reports.
- Please make a computer file available at the review meeting that contains all important estimates from the reviewed model and data. The file should include catch (total and by fleet), survey data with CVs, total biomass, SSB, recruits, F and any other whole stock mortality measures. Estimated age structure (numbers at age) would be useful as well. It is much easier to thoroughly review an assessment if these figures are available. I had to enter some myself but fortunately found a way to convert PDF tables to Excel format.

Appendix 1: Bibliography of materials provided for review

The two primary documents discussed at the SEDAR-82 meeting were:

SEDAR. 2023. SEDAR-82, South Atlantic Grey Triggerfish, Data Workshop Final Report, January 2023. SEDAR, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405

SEDAR. 2024. SEDAR-82, South Atlantic Grey Triggerfish, Section III: Assessment Report, February 2024. SEDAR, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405

For workshop working papers, see: https://sedarweb.org/assessments/sedar-82/

For workshop reference papers, see: https://sedarweb.org/documents/sedar-82-south-atlantic-gray-triggerfish-document-list-9-26-2022/

For Data Workshop, Assessment and Review Terms of Reference (TOR) see: https://sedarweb.org/documents/sedar-82-south-atlantic-gray-triggerfish-terms-of-reference/

Appendix 2: Performance Work Statement

Performance Work Statement (PWS)

National Oceanic and Atmospheric Administration (NOAA)

National Marine Fisheries Service (NMFS)

Center for Independent Experts (CIE) Program

External Independent Peer Review

Under Contract #1305M219DNFFK0025

SEDAR 82 South Atlantic Gray Triggerfish Assessment Review

Background

The National Marine Fisheries Service (NMFS) is mandated by the Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act, and Marine Mammal Protection Act to conserve, protect, and manage our nation's marine living resources based upon the best scientific information available (BSIA). NMFS science products, including scientific advice, are often controversial and may require timely scientific peer reviews that are strictly independent of all outside influences. A formal external process for independent expert reviews of the agency's scientific products and programs ensures their credibility. Therefore, external scientific peer reviews have been and continue to be essential to strengthening scientific quality assurance for fishery conservation and management actions.

Scientific peer review is defined as the organized review process where one or more qualified experts review scientific information to ensure quality and credibility. These expert(s) must conduct their peer review impartially, objectively, and without conflicts of interest. Each reviewer must also be independent from the development of the science, without influence from any position that the agency or constituent groups may have. Furthermore, the Office of Management and Budget (OMB), authorized by the Information Quality Act, requires all federal agencies to conduct peer reviews of highly influential and controversial science before dissemination, and that peer reviewers must be deemed qualified based on the OMB Peer Review Bulletin standards. (https://www.whitehouse.gov/wp-content/uploads/legacy_drupal_files/omb/memoranda/2005/m05-03.pdf)

Scope

The **Southeast Data, Assessment, and Review (SEDAR)** is the cooperative process by which stock assessment projects are conducted in NMFS' Southeast Region. SEDAR was initiated to improve planning and coordination of stock assessment activities and to improve the quality and reliability of assessments.

SEDAR 82 will be a CIE assessment review conducted for South Atlantic Gray Triggerfish. There is one model to be reviewed. The review workshop provides an independent peer review of SEDAR stock assessments. The term review is applied broadly, as the review panel may request additional analyses, error corrections and sensitivity run of the assessment models provided by the assessment panel. The review panel is ultimately responsible for ensuring that the assessment is appropriate for use by fishery managers. The specified format and contents of the individual peer review reports are found in **Annex 1**. The Terms of Reference (ToRs) of the peer review are listed in **Annex 2**. The tentative agenda of the panel review meeting is attached in **Annex 3.**

Requirements

NMFS requires three (3) reviewers to conduct an impartial and independent peer review in accordance with the Performance Work Statement (PWS), OMB guidelines, and the ToRs below. The reviewers shall have a working knowledge in stock assessment, statistics, fisheries science, and marine biology sufficient to complete the primary task of providing peer-review advice in compliance with the workshop Terms of Reference fisheries stock assessment. The chair, who is in addition to the three reviewers, will not be provided by the CIE. Although the chair will be participating in this review, the chair's participation (e.g., labor and travel) is not covered by this contract.

Tasks for Reviewers

1) Two weeks before the peer review, the Project Contacts will send (by electronic mail or make available at an FTP site) to the CIE reviewers the necessary background information and reports for the peer review. In the case where the documents need to be mailed, the Project Contacts will consult with the contractor on where to send documents. CIE reviewers are responsible only for the pre-review documents that are delivered to the reviewer in accordance with the PWS scheduled deadlines specified herein. The CIE reviewers shall read all documents in preparation for the peer review.

2) Attend and participate in an in-person review meeting. The meeting will consist of presentations by NOAA and other scientists, stock assessment authors and others to facilitate the review, to answer any questions from the reviewers, and to provide any additional information required by the reviewers.

3) After the review meeting, reviewers shall conduct an independent peer review report in accordance with the requirements specified in this PWS, OMB guidelines, and ToRs, in adherence with the required formatting and content guidelines; reviewers are not required to reach a consensus.

4) Each reviewer shall assist the Chair of the meeting with contributions to the summary report.

5) Deliver their reports to the Government according to the specified milestones dates.

Foreign National Security Clearance

When reviewers participate during a panel review meeting at a government facility, the NMFS Project Contact is responsible for obtaining the Foreign National Security Clearance approval for reviewers who are non-US citizens. For this reason, the reviewers shall provide requested information (e.g., first and last name, contact information, gender, birth date, passport number, country of passport, travel dates, country of citizenship, country of current residence, and home country) to the NMFS Project Contact for the purpose of their security clearance, and this information shall be submitted at least 30 days in accordance with the NOAA Deemed Export Technology Control Program NAO 207-12 regulations available at the [Foreign National Guest website](). The contractor is required to use all appropriate methods to safeguard Personally Identifiable Information (PII).

Place of Performance

The places of performance shall be at the cooperator's facilities and Atlantic Beach, NC.

Period of Performance

The period of performance shall be from the time of award through May 2024. Each CIE reviewer's duties shall not exceed 14 days to complete all required tasks.

Schedule of Milestones and Deliverables: The contractor shall complete the tasks and deliverables in accordance with the following schedule.

Within two weeks of award	Contractor selects and confirms reviewers
2 weeks prior to the panel review	Contractor provides the pre-review documents to the reviewers
March 12-14, 2024	Panel review meeting
Approximately 3 weeks later	Contractor receives draft reports
Within 2 weeks of receiving draft reports	Contractor submits final reports to the Government

*The Chair's Summary Report will not be submitted to, reviewed, or approved by the Contractor.

Applicable Performance Standards

The acceptance of the contract deliverables shall be based on three performance standards:

(1) The reports shall be completed in accordance with the required formatting and content; (2) the reports shall address each ToR as specified; and (3) the reports shall be delivered as specified in the schedule of milestones and deliverables.

Confidentiality and Data Privacy
This contract may require that services contractors have access to Privacy Information. Services contractors are responsible for maintaining the confidentiality of all subjects and materials and may be required to sign and adhere to a Non-disclosure Agreement (NDA).

Travel

All travel expenses shall be reimbursable in accordance with Federal Travel Regulations (http://www.gsa.gov/portal/content/104790) and all contractor travel must be approved by the COR prior to the actual travel. Any travel conducted prior to the receipt of proper written authorization from the COR will be done at the Contractor's own risk and expense. International travel is authorized for this contract. Travel is not to exceed $12,000.

Restricted or Limited Use of Data

The contractors may be required to sign and adhere to a non-disclosure agreement.

Project Contacts:

Larry Massey – NMFS Project Contact
150 Du Rhu Drive, Mobile, AL 36608
(386) 561-7080
larry.massey@noaa.gov

Meisha Key - SEDAR Coordinator
Science and Statistics Program
South Atlantic Fishery Management Council
4055 Faber Place Drive, Suite 201 North Charleston, SC 29405
Meisha.Key@safmc.net

Annex 1: Peer Review Report Requirements

1. The report must be prefaced with an Executive Summary providing a concise summary of the findings and recommendations, and specify whether the science reviewed is adequate.

2. The report must contain a background section, description of the individual reviewers' roles in the review activities, summary of findings for each ToR in which the weaknesses and strengths are described, and conclusions and recommendations in accordance with the ToRs.

   a. Reviewers must describe in their own words the review activities completed during the panel review meeting, including a brief summary of findings, of the science, conclusions, and recommendations.

   b. Reviewers shall discuss their independent views on each ToR even if these were consistent with those of other panelists, but especially where there were divergent views.

   c. Reviewers shall elaborate on any points raised in the summary report that they believe might require further clarification.

   d. Reviewers shall provide a critique of the NMFS review process, including suggestions for improvements of both process and products.

   e. The report shall be a stand-alone document for others to understand the weaknesses and strengths of the science reviewed, regardless of whether or not they read the summary report. The report shall represent the peer review of each ToR, and shall not simply repeat the contents of the summary report.

3. The report shall include the following appendices:

   Appendix 1: Bibliography of materials provided for review

   Appendix 2: A copy of this Performance Work Statement

   Appendix 3: Panel membership or other pertinent information from the panel review meeting.

SEDAR 82 South Atlantic Gray Triggerfish Assessment

Review Workshop Terms of Reference

Review Workshop Terms of Reference

1) Evaluate the data used in the assessment. Consider the following:
   a) Are data decisions made by the DW and AW justified?
   b) Are data uncertainties acknowledged, reported, and properly characterized?
   c) For model derived data and parameter inputs (e.g., indices of abundance, life history quantities) are the methods appropriate?

2) Evaluate and discuss the strengths and weaknesses of the methods used to assess the stock, taking into account the available data. Consider the following:
   a) Are the methods appropriate for the available data?
   b) Are assessment models configured properly and used in a manner consistent with standard practices?
   c) Were modeling issues clearly identified and addressed? If not, recommend potential methods for addressing these issues.

3) Consider how uncertainties in the assessment are addressed.
   a) Comment on the degree to which methods used to evaluate uncertainty reflect and capture the significant sources of uncertainty in the input data.
   b) Comment on sources of uncertainty not accounted for and possible approaches for incorporating these sources into future assessments (e.g. ecosystem, management policies).

4) Provide, or comment on, recommendations to improve the assessment
   a) Consider the research recommendations provided by the Data and Assessment workshops in the context of overall improvement to the assessment, and make any additional research recommendations warranted.
   b) If applicable, provide recommendations for improvement or for addressing any inadequacies identified in the data or assessment modeling. These recommendations should be described in sufficient detail for application, and should be practical for short-term implementation (e.g., achievable within ~6 months). Longer-term recommendations should instead be listed as research recommendations above.

5) Provide recommendations on possible ways to improve the Research Track Assessment process.

6) Prepare a Review Workshop Summary Report describing the Panel's evaluation of the Research Track stock assessment and addressing each Term of Reference.

Annex 3: Tentative Agenda - SEDAR 82 South Atlantic Gray Triggerfish Assessment Review

March 12-14, 2024

Monday - Travel

Tuesday

8:30 – 9:00 a.m.	**Introductions and Opening Remarks**	**Coordinator**
	- Agenda Review, ToR, Task Assignments	
	- Take Breaks as needed throughout	
9:00 a.m. – 12:00 p.m.	**Assessment Presentations**	**TBD**
12:00 p.m. – 1:30 p.m.	**Lunch Break**	
1:30 p.m. – 5:00 p.m.	**Panel Discussion**	**Chair**
	- *Assessment Data & Methods*	
	- Identify additional analyses, sensitivities, corrections	
	- Review additional analyses	
5:00 p.m. – 5:30 p.m.	**ToR Review & Daily Wrap-Up**	**Chair**
5:30 p.m. - 6:00 p.m.	**Public Comment**	**Chair**

***Tuesday Goals*:** Initial presentations completed, sensitivities and modifications identified.

Wednesday

8:30 a.m. – 12:00 p.m.	**Panel Discussion**	**Chair**
	- Review additional analyses, sensitivities	
	- Consensus recommendations and comments	
12:00 p.m. – 1:30 p.m.	**Lunch Break**	
1:30 p.m. – 5:00 p.m.	**Panel Discussion / Work Session**	**Chair**
5:00 p.m. – 5:30 p.m.	**Daily Wrap-Up**	**Chair**
5:30 p.m. - 6:00 p.m.	**Public Comment**	**Chair**

Wednesday Goals: Final sensitivities identified, preferred models selected, projection approaches approved, begin summary report drafts.

Thursday

8:30 a.m. – 12:00 p.m.	**Panel Discussion**	**Chair**
	- Final sensitivities reviewed.	
	- Projections reviewed.	
12:00 p.m. – 1:30 p.m.	**Lunch Break**	
1:30 p.m. – 5:00 p.m.	**Panel Discussion / Work Session**	**Chair**
	- Review Consensus Reports	
5:00 p.m. – 5:30 p.m.	**Daily Wrap-Up**	**Chair**
5:30 p.m. - 6:00 p.m.	**Public Comment**	**Chair**

Thursday Goals: Complete assessment work and discussions. Final results available. Draft Summary Report reviewed.

Friday - Travel

Appendix 3: Panel membership and other pertinent information

- Marcel Reichert (Chair – South Atlantic Fishery Management Council, Scientific and Statistical Committee, SAFMC SSC)
- Anne Markwith (SAFMC SSC and Marine Fisheries-Fisheries Management Section, Wilmington Regional Office, North Carolina Department of Environmental Quality)
- Alexei Sharov (SAFMC SSC and Stock Assessment Program, Maryland Department of Natural Resources)
- Steven Holmes (CIE and National Institute of Water & Atmospheric Research Ltd (NIWA), Wellington, NZ),
- Mark Dickey-Collas (CIE and Dickey-Collas Marine, London, UK)
- Larry Jacobson, (CIE and Retired Stock Assessment Biologist)