



SEDAR

SouthEast Data, Assessment, and Review

4055 Faber Place Drive #201
North Charleston SC 29405

Phone (843) 571-4366
Fax (843) 769-4520
www.sedarweb.org

SEDAR Benchmark Assessment: Atlantic Blueline Tilefish Terms of Reference

Councils with Jurisdiction: SAFMC (SEDAR Lead) & MAFMC

Terminal Year = 2015

Modified 12/14/2015, updated DW ToR #1, revised AW ToR #6, addendum

Data Workshop Terms of Reference

1. Define the unit stock for the SEDAR 50 stock assessment to include the entire US Atlantic seaboard, using the boundary between the Gulf of Mexico and South Atlantic Councils as the southwestern boundary for the stock unit to assess.
2. Review, discuss, and tabulate available life history information.
 - Evaluate age, growth, natural mortality, and reproductive characteristics
 - Provide appropriate models to describe population and fleet specific (if warranted) growth, maturation, and fecundity by age, sex, or length as applicable.
 - Evaluate the adequacy of available life-history information for conducting stock assessments and recommend life history information for use in population modeling.
 - Provide estimates or ranges of uncertainty for all life history information.
3. Recommend discard mortality rates.
 - Review available research and published literature
 - Consider research directed at these species as well as similar species from the SE and other areas.
 - Provide estimates of discard mortality rate by fishery, gear type, depth, and other feasible or appropriate strata.
 - Include thorough rationale for recommended discard mortality rates.
 - Provide justification for any recommendations that deviate from the range of discard mortality provided in the last benchmark or other prior assessment.
 - Provide estimates of uncertainty around recommended discard mortality rates.
4. Provide measures of population abundance that are appropriate for stock assessment.
 - Consider and discuss all available and relevant fishery dependent and independent data sources.
 - Document all programs evaluated; address program objectives, methods, coverage, sampling intensity, and other relevant characteristics.



- Provide maps of fishery and survey coverage.
 - Develop fishery and survey CPUE indices by appropriate strata (e.g., age, size, area, and fishery) and include measures of precision and accuracy.
 - Discuss the degree to which available indices adequately represent fishery and population conditions.
 - Recommend which data sources are considered adequate and reliable for use in assessment modeling.
 - Rank the available indices with regard to their reliability and suitability for use in assessment modeling.
 - Provide appropriate measures of uncertainty for the abundance indices to be used in stock assessment models.
5. Provide commercial catch statistics, including both landings and discards in both pounds and number.
 - Evaluate and discuss the adequacy of available data for accurately characterizing harvest and discard by species and fishery sector or gear.
 - Provide length and age distributions for both landings and discards if feasible.
 - Provide maps of fishery effort and harvest.
 - Provide estimates of uncertainty around each set of landings and discard estimates.
 6. Provide recreational catch statistics, including both landings and discards in both pounds and number.
 - Evaluate and discuss the adequacy of available data for accurately characterizing harvest and discard by species and fishery sector or gear.
 - Provide length and age distributions for both landings and discards if feasible.
 - Provide maps of fishery effort and harvest.
 - Provide estimates of uncertainty around each set of landings and discard estimates.
 7. Consider ecosystem and climate issues that could affect population dynamics. Identify and describe available data sources to investigate the effects of abiotic and biotic factors, for example climate change, predator/prey interactions, etc., on recruitment, growth, geographic distribution, and natural mortality.
 8. Provide recommendations for future research in areas such as sampling, fishery monitoring, and stock assessment. Include specific guidance on sampling intensity (number of samples including age and length structures) and appropriate strata and coverage.
 9. Prepare the Data Workshop report providing complete documentation of workshop actions and decisions in accordance with project schedule deadlines (Section II. of the SEDAR assessment report).

Assessment Workshop Terms of Reference

1. Review any changes in data following the data workshop and any analyses suggested by the data workshop. Summarize data as used in each assessment model. Provide justification for any deviations from Data Workshop recommendations.
2. Develop population assessment models that are compatible with available data and document input data, model assumptions and configuration, and equations for each model considered.
 - Consider spatially explicit modeling approaches to address potential stock overlap of the management jurisdictions of the MAFMC-SAFMC.
 - Provide a means of developing management reference points and fishing level recommendations for each management jurisdiction in the event a single unit stock overlaps Council jurisdictions.
 - Fully document and describe the impacts (on population parameters and management benchmarks) of any changes to the model structure, methods, application or fitting procedures made between this assessment and the prior assessment (SEDAR 32).
3. Provide estimates of stock population parameters, if feasible.
 - Include fishing mortality, abundance, biomass, selectivity, stock-recruitment relationship (if applicable), and other parameters as necessary to describe the population.
 - Include appropriate and representative measures of precision for parameter estimates.
 - Compare and contrast population parameters and time series estimated in this assessment with values from the previous (SEDAR 32) assessment, and comment on the impacts of changes in data, assumptions or assessment methods on estimated population conditions.
4. Provide estimates of yield and productivity.
 - Include yield-per-recruit, spawner-per-recruit, and stock-recruitment models.
5. Provide estimates of population benchmarks or management criteria consistent with the available data, applicable FMPs, proposed FMPs and Amendments, other ongoing or proposed management programs, and National Standards. Include values for fishing mortality (including assumed discard mortality if appropriate), spawning stock biomass, fishery yield, SPR and recruitment for potential population benchmarks.
 - Evaluate existing or proposed management criteria as specified in the management summary.
 - Evaluate potential management benchmarks including F_{max} , F_{msy} , and $F_{20\%}$, 30% , and 40% SPR. Comment on the reliability of MSY estimates and possible proxy values given available data and ability to estimate necessary parameters such as steepness.
 - Compare and contrast reference values estimated in this assessment with values from the previous (SEDAR 32) assessment, and comment on the impacts of changes in data, assumptions or assessment methods on reference point differences.
6. Characterize uncertainty in the assessment and estimated values

- Consider uncertainty in input data, modeling approach, and model configuration.
 - Provide a continuity model consistent with the prior assessment configuration, if one exists, updated to include the most recent observations. Alternative approaches to a strict continuity run that distinguish between model, population, and input data influences on findings, may be considered.
 - Consider other sources as appropriate for this assessment
 - Provide appropriate measures of model performance, reliability, and ‘goodness of fit’
 - Provide measures of uncertainty for estimated parameters and model output.
 - Consider exploratory models based on the Stock ID work group and Joint SSC Stock ID Review Panel recommendations to 1) characterize and describe the impact of the stock unit definition on risk and uncertainty, and 2) illustrate approaches for assigning productivity by existing Council management units.
7. Consider incorporating applicable abiotic and biotic factors, for example climate change, predator/prey interactions, etc., in the assessment model and discuss impacts on recruitment, growth, geographic distribution, and natural mortality.
 8. Perform a probabilistic analysis of proposed reference points, stock status, and yield.
 - Provide the probability of overfishing at various harvest or exploitation levels.
 - Provide a probability density function for biological reference point estimates.
 - If the stock is overfished, provide the probability of rebuilding within mandated time periods as described in the management summary or applicable federal regulations.
 9. Project future stock conditions (biomass, abundance, and exploitation) and develop rebuilding schedules if warranted; include estimated generation time. Stock projections shall be developed in accordance with the following:
 - A) If stock is overfished:
 - $F=0$, $F=current$, $F=F_{msy}$, F_{target}
 - $F=F_{rebuild}$ (max that rebuild in allowed time)
 - B) If stock is not overfished:
 - $F=F_{current}$, $F=F_{msy}$, $F= F_{target}$
 - C) If data limitations preclude standard projections (i.e. A, B above), explore alternate models to provide management advice.
 10. Provide recommendations for future research and data collection.
 - Be as specific as practicable in describing sampling design and sampling intensity.
 - Emphasize items which will improve future assessment capabilities and reliability.
 - Consider data, monitoring, and assessment needs.
 11. Complete the Assessment Workshop Report in accordance with project schedule deadlines (Section III of the SEDAR Stock Assessment Report).

Review Workshop Terms of Reference

1. Evaluate the data used in the assessment, addressing the following:
 - a) Are data decisions made by the DW and AW sound and robust?
 - b) Are data uncertainties acknowledged, reported, and within normal or expected levels?
 - c) Are data applied appropriately within the assessment model?
 - d) Are input data series reliable and sufficient to support the assessment approach and findings?
2. Evaluate the methods used to assess the stock, taking into account the available data.
 - a) Are methods scientifically sound and robust? Do the methods follow accepted scientific practices?
 - b) Are assessment models configured appropriately and applied consistent with accepted scientific practices?
 - c) Are the methods appropriate for the available data?
3. Evaluate the assessment findings with respect to the following:
 - a) Are population estimates (model output – e.g. abundance, exploitation, biomass) reliable, consistent with input data and population biological characteristics, and useful to support status inferences?
 - b) Is the stock overfished? What information helps you reach this conclusion?
 - c) Is the stock undergoing overfishing? What information helps you reach this conclusion?
 - d) Is there an informative stock recruitment relationship? Is the stock recruitment curve reliable and useful for evaluation of productivity and future stock conditions?
 - e) Are the quantitative estimates of the status determination criteria for this stock appropriate for management use? If not, are there other indicators that may be used to inform managers about stock trends and conditions?
4. Evaluate the stock projections, addressing the following:
 - a) Are the methods consistent with accepted practices and available data?
 - b) Are the methods appropriate for the assessment model and outputs?
 - c) Are the results informative and robust, and useful to support inferences of probable future conditions?
 - d) Are key uncertainties acknowledged, discussed, and reflected in the projection results?
5. Consider how uncertainties in the assessment, and their potential consequences, are addressed.
 - Comment on the degree to which methods used to evaluate uncertainty reflect and capture all sources of uncertainty in the population, data sources, and assessment methods
 - Are the implications of uncertainty in technical conclusions clearly stated?
6. Consider the research recommendations provided by the Data and Assessment workshops and make any additional recommendations or prioritizations warranted.

- Clearly denote research and monitoring that could improve the reliability of, and information provided by, future assessments.
 - Provide recommendations on possible ways to improve the SEDAR process.
7. Provide suggestions on improvements in data or modeling approaches which should be considered when scheduling the next assessment.
 8. Prepare a Peer Review Summary of the Panel's evaluation of the stock assessment, addressing each Term of Reference. Develop a list of tasks to be completed following the workshop. Complete and submit the Peer Review Summary Report in accordance with the project guidelines.

SEDAR 50 Terms of Reference Addendum

SEDAR 50 Terms of Reference were developed per SEDAR policies and procedures and were reviewed and approved by the South Atlantic and Mid-Atlantic Fishery Management Councils. Through the original Data Workshop TOR #1 (see below), the Stock ID work group was tasked with reviewing the available data and making recommendations on biological stock structure and the unit stock(s) to be addressed through SEDAR 50. These recommendations would be subsequently reviewed by the Data Workshop Panel. The anticipated focus of the Stock ID work group meeting (held June 28-30, 2016) was on the stock structure in the Atlantic so there was limited participation from the Gulf of Mexico and the GMFMC was not asked to appoint participants to the work group. The work group's full recommendations can be found in SEDAR50-DW12 and included recommending Blueline Tilefish from the Gulf of Mexico and along the entire US Atlantic seaboard be considered a single biological population unit. After the Stock ID work group meeting (July 2016), a memo was sent to the SEDAR Steering Committee notifying them of this recommendation.

At their September 2016 meeting, the SEDAR Steering Committee discussed Stock ID and noted that Stock ID decisions have management implications and should include review and consideration by managers. They developed the following process to address Stock ID decisions for SEDAR 50.

1. Request a joint (MAFMC, GMFMC, SAFMC) SSC sub-panel to review the Stock ID work group's report and to provide advice on addressing the stock unit-management unit overlap for Blueline Tilefish in the Gulf of Mexico and comment on the risks of management based on the GMFMC boundary.
2. Convene a call with Leadership from NEFSC, SEFSC, SERO, GARFO, MAFMC, SAFMC, and GMFMC to resolve any remaining Stock ID issues and provide guidance on appropriate assessment ToR.

The joint SSC Sub-Panel Stock ID Review webinar was held Oct 28, 2016. The full consensus statements from this webinar can be found in SEDAR50-DW16.

The Leadership Group call was held Nov 14, 2016. Their full recommendations can be found in SEDAR50-DW17. Their recommendations included using the boundary between the Gulf of Mexico and South Atlantic Council as the southwestern boundary for the SEDAR 50 stock assessment of Blueline Tilefish. This group also recommended that research be conducted to fully define population structure of Blueline Tilefish in the Gulf of Mexico, and to define the relationship between fish in the Gulf of Mexico with those in the Atlantic.

In order to address the Leadership Group's final Stock ID recommendations and consider exploratory models based on the Stock ID work group and SSC Stock ID Review Panel's recommendations, changes were made to Data Workshop ToR #1 and an additional bullet was added to Assessment Workshop ToR #6. These changes to the TORs were approved by the SAFMC

at its December 2016 meeting and approved by the MAFMC via email in December 2016. The revised Data Workshop TOR #1 and Assessment Workshop ToR #6 are shown in the TORs with the 12/14/2016 modified date.

SEDAR Data Best Practices recommendations regarding Stock ID are found below. Please see the Data Best Practices Living Document (Sept 2016) 'Section 2.1 Life History: Issue 1' for full issue description & justification:

- *Members of the SEDAR Data Workshop Life History Working Group can review the literature (including peer-reviewed manuscripts and gray literature (state or federal agencies reports, thesis/dissertations, etc.)) to determine if there is evidence to suggest a separation of stock biologically (e.g., tag/recapture studies, otolith chemistry, genetics, movement, migrations, habitat preferences) and present these findings in accordance with the final SEDAR process timeline (22 weeks before Data Workshop).*
- *Members of all SEDAR Working Groups were in agreement that decisions on Stock Boundaries need to be decided early in the SEDAR process timeline. The proposal of a special topic SEDAR workshop to review the current stock boundaries for species by Fishery Management Plans (Gulf of Mexico, South Atlantic, Caribbean and Highly Migratory Species) was in agreement by all participants. These workshops could be specific for species that have been recently assessed or for those on the current SEDAR schedule. These workshops would provide recommendations for stock boundaries by species. The decisions of these special topic workshops would be reviewed in accordance with the final SEDAR process timeline (22 weeks prior to the SEDAR Data Workshop) to discuss if any new research is available to warrant a change in the species stock boundary.*
- *For those SEDARs already scheduled (as of July 2015), the available data on stock boundaries should be reviewed as soon as possible, but no later than the SEDAR Data Workshop Data Scoping Calls. The decisions about stock boundaries need to be reviewed by representatives from each of the working groups (i.e., life history, commercial, recreational, indices), the management council, and NMFS Southeast Regional Office (SERO).*
- *Members of the SEDAR Data Workshop Commercial Working Group, SEDAR Data Workshop Recreational Working Group, representatives from the management councils and SERO can review the current management boundaries and current fishing practices (i.e., behavior of fleet) to determine if there is evidence to suggest a separation of stock for management purposes and present this information during the SEDAR Data Workshop Data Scoping Call. Estimates from recreational and commercial datasets will follow the stock boundary as best as possible given each dataset's spatial resolution.*
- *Stock boundary must be determined early in the SEDAR process and included in the ToR. If Fishery Management Council boundaries are used then Monroe County will be split at U.S. Highway 1 in the Florida Keys (jurisdictional boundary between the SAFMC and GMFMC). See commercial working group technical issue – Monroe County for further details.*

SEDAR 50 Original Data Workshop ToR #1

1. Review stock structure and unit stock definitions and consider whether changes are required.

NOTE: Information and recommendations to address this TOR will be developed prior to the Data Workshop by a Stock ID work group. The recommendations of the workgroup will be reviewed by the data workshop panel. The work group, including representatives from the SAFMC and MAFMC, and the Southeast and Greater Atlantic Regions, is charged with addressing the following:

- a. Review genetics studies, growth patterns, existing stock definitions, prior SEDAR stock ID recommendations and any other relevant information on blueline tilefish stock structure.*
- b. Make recommendations on biological stock structure and define the unit stock or stocks to be addressed through this assessment.*
- c. Provide recommendations to address Council management jurisdictions, to support management of the stock or stocks, and specification of management benchmarks and fishing levels, by Council jurisdiction (SAFMC/MAFMC) in a manner consistent with the productivity measures of the assessment.*
- d. Document work group discussion and recommendations through a working paper for SEDAR 50.*
- e. Work Group recommendations will be used to address Data Workshop Term of Reference 1: Review stock structure and unit stock definitions and consider whether changes are required.*