**SEDAR 82**

# South Atlantic Gray Triggerfish Research Track Assessment Terms of Reference

**Draft: October 2021**

## Data Workshop Terms of Reference

1) Review stock structure and unit stock definitions.

2) Review, discuss, and summarize available life history information.
   a) Evaluate age, growth, natural mortality, meristic conversions (length-weight relationship, length-length relationship), and reproductive characteristics (maturity, fecundity, sex ratio, and spawning season).
   b) Evaluate age data and methodology across ageing facilities and discuss validation techniques.
   c) Provide appropriate models to describe population and fleet specific (if warranted) growth, maturity, and fecundity by age, sex, or length as applicable.
   d) Evaluate and discuss the sources of uncertainty and error, and data limitations (such as temporal and spatial coverage) for each data source. Provide estimates or ranges of uncertainty for natural mortality and other model based parameter values.
   e) Discuss the adequacy of available life history information for conducting stock assessments and recommend life history information for use in population modeling.

3) Provide measures of population abundance that are appropriate for stock assessment
   a) Consider all available and relevant fishery-dependent and -independent data sources
   b) Document all programs evaluated; address program objectives, methods, coverage, sampling intensity, and other relevant characteristics.
   c) Provide maps of fishery dependent and independent survey coverage.
   d) Develop fishery and survey CPUE indices, standardize as appropriate, generate measures of precision, and document all methods.
   e) Document pros and cons of available indices regarding their ability to represent abundance.
      i) Characterize species identification issues and identify whether the index is representative of Gray Triggerfish Stock.
   f) For recommended indices, document any known or suspected temporal patterns in catchability not accounted for by standardization.
   g) Categorize the available indices into one of three tiers: suitable and recommended, suitable and not recommended, or not suitable; provide justifications for the categorization.
   h) For any recommended fishery independent surveys provide age and length composition as appropriate.

4) Provide commercial catch statistics, including both landings and discards in both pounds and numbers.
   a) Characterize any species identification issues and correct for these instances as appropriate.

b) Review SEDAR 41 methods for pooling gear types into a single commercial gear and, if appropriate, maintain that fleet structure; otherwise recommend an alternative fleet structure.
c) Evaluate and discuss the adequacy of available data for accurately characterizing landings and discards by fishery sector or gear. Discuss any temporal trends in the reliability of the commercial estimates and potential impacts of COVID-19.
d) Provide length and age distributions for both landings and discards as appropriate.
e) Provide maps of fishery effort and harvest by fishery sector or gear.
f) Develop catch streams (landings and discards), generate measures of precision, and document all methods.

5) Provide recreational catch statistics for each stock being assessed, including both landings and discards in both pounds and number.
   a) Characterize any species identification issues and correct for these instances as appropriate.
   b) Review SEDAR 41 methods for pooling gear types into two recreational gears and, if appropriate, maintain that fleet structure; otherwise recommend an alternative fleet structure.
   c) Evaluate and discuss the adequacy of available data for accurately characterizing landings and discards by fishery sector or gear. Discuss any temporal trends in the reliability of the recreational estimates.
   d) Evaluate the potential source of outliers in MRIP catch data and potential impacts of COVID-19.
   e) Provide length and age distributions for both landings and discards as appropriate.
   f) Provide maps of fishery effort and harvest by fishery sector or gear.
   g) Develop catch streams (landings and discards), generate measures of precision, and document all methods.

6) Recommend discard mortality rates.
   a) Review available research and published literature.
      i) Consider research directed at Gray Trigger as well as similar species from the southeastern United States and other areas.
   b) Provide estimates of discard mortality rate by fleet and temporal structure as appropriate.
   c) Provide estimates of uncertainty around recommended discard mortality rates
   d) Document the rationale for recommended rates and uncertainties.

7) Describe any known evidence regarding ecosystem, climate, species interactions, habitat considerations, and/or episodic events *(such as red tide and upwelling events)* that would reasonably be expected to affect Gray Trigger population dynamics.
   a) Identify available analysis that could improve the understanding of important ecosystem relationships or trends that can be accounted for in the assessment.

8) Provide recommendations for future research in areas such as sampling, fishery monitoring, and stock assessment.

9) Prepare a Data Workshop report providing complete documentation of workshop actions and decisions in accordance with project schedule deadlines.

**Assessment Process Terms of Reference**

1) Review any changes in data or analyses following the Data Workshop. Summarize data as used in each assessment model. Provide justification for any deviations from Data Workshop recommendations.

2) Develop population assessment model(s) that are appropriate for the available data.
   a) Provide standard model outputs such as parameter estimates and derived quantities.
   b) Evaluate model diagnostics.
   c) If multiple models are applied then compare and contrast model performances and appropriateness.
   d) Identify modeling issues encountered.

3) Recommend biological reference points for use in management.

4) Characterize uncertainty in the assessment and estimated values.
   a) Incorporate uncertainty of appropriate input data.
   b) Provide measures of uncertainty for estimated parameters and derived quantities, including biological reference points and stock status that incorporates appropriate input parameter and data uncertainty.

5) Comment on the data component weighting used in this stock assessment.

6) Provide recommendations for future research to improve the assessment. Distinguish between long term research needs and short term research recommendations that could potentially be implemented for Gray Triggerfish Operational Assessments.

7) Complete an Assessment Workshop Report in accordance with project schedule deadlines.

**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.