Gulf Fishery Management Council
Managing Fishery Resources in the U.S. Federal Waters of the Gulf

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Gulf Gray Triggerfish
Operational Assessment Terms of Reference
DRAFT: May 2025

Data Workshop Terms of Reference

Objective: Evaluate and revise the SEDAR 43 Gulf gray triggerfish base model, with data through 2024, where possible. Employ assessment best practices and necessary revisions in order to provide a model that describes the population dynamics of the stock and is capable of producing management advice.

1. Explore the appropriateness of an age-based, length-based, and hybrid (age- and length-based) approaches for describing fleet and survey selectivity.

2. Use the Marine Recreational Information Program's Access Point Angler Intercept Survey and Fishing Effort Survey to inform catch and effort for the recreational sector. Consider state-specific catch, effort, and discards from state surveys as applicable (Florida: State Reef Fish Survey; Alabama: Snapper Check; Mississippi: Tails 'n Scales [effort]; Louisiana: LA Creel; Texas: TPWD Creel).
    - Describe any annual differences in the magnitude of landings from the previous assessment greater than 10%, with assistance from the NOAA Office of Science and Technology.
3. Review available life history information, including the ageing methodology. Update growth curves, age and length data, and the natural mortality estimates.
    - Summarize, describe, and tabulate length and age data by year and fleet/survey and area through the terminal year of the assessment where possible.
    - Explore the validity and representativeness of length and age data and ageing methodology across ageing facilities and cooperators.
    - Explore differences in growth parameters if length and/or age sampling methods differ from the previous assessment. Utilize appropriate models and diagnostics to describe population and region-specific (if warranted) growth, as applicable.
    - Develop age-length keys and Conditional Age at Length as appropriate.
    - 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 length and age data as a whole and by area and source.
4. Provide fishery-independent measures of population abundance developed through the terminal year where possible.
    - Evaluate the G-FISHER composite video index for use in the assessment.
        - Consider any changes to the fishery-independent indices comprising the GFISHER index as provided for the previous assessment and evaluate the representativeness through time of the composition data.

- Evaluate the compositions available. Recommend modifications needed to inform differences in catchability and selectivity of the surveys.
- Provide appropriate measures of uncertainty for all fishery-independent abundance indices and effort time series considered.

5. Provide commercial catch statistics for both the Eastern and Western Gulf, including both landings and discards in both pounds and number extended through the terminal year. Provide a corresponding working paper for the data and analyses with the following:
    - Evaluate and discuss the adequacy of available data for accurately characterizing landings and discards by fishery sector or gear in pounds whole weight.
    - Provide length and age distributions for both landings and discards, if feasible.
    - Provide estimates of uncertainty around each set of landings and discard estimates.
6. Utilize the new estimates of shrimp fishery effort and bycatch, as appropriate, based on the peer review of such data from SEDAR 87 and subsequent analyses.
7. Document any change in start year from previous assessments
    - Evaluate the existing composition data and recommend whether the data are sufficient to represent the bycatch by the fleet.
8. Document all new methodologies:
    - Address program objectives, methods, coverage, sampling intensity, and other relevant characteristics.
9. Provide recommendations for future research in areas such as sampling, fishery monitoring, and stock assessment. Include guidance on sampling intensity and appropriate strata and coverage.
10. 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. Evaluate and document the following specific changes in input data or deviations from the previous assessment model.
2. Consider continuity model stratification and data structure, and suggest any recommended revisions.
    - Re-evaluate whether commercial and recreational fleets should be separated by East and West by reviewing all available data (landings, discards, indices, compositions).
    - Provide estimates of uncertainty around each set of landings and discard estimates.
    - Review ageing validation and ageing structures studies, and consider their appropriateness for inclusion in the assessment model.
        i. Update life history data/analyses (e.g., maximum age, growth, mortality, ageing error matrix, reproduction) given revised age data following recent ageing studies as needed.
    - Explore the use of a combined video index from the FWRI, Pascagoula, and Panama City video surveys (e.g., GFISHER). Recommend modifications needed to inform differences in catchability and selectivity of the surveys.
    - Evaluate the start year and initial Fs used in the assessment model.

- Explore shrimp bycatch magnitude and age-structure, if data are available (e.g., SEAMAP Summer and Fall Groundfish Trawls or shrimp observer data).
- Explore fleet-specific length compositions and remote sensing data for sargassum coverage as a potential index of recruitment.
- Consider recent discard mortality studies and analytical results, and incorporate updated discard mortality rate(s) as appropriate.

3. Document any revisions or corrections made to the input datasets, and provide updated input data tables. Provide commercial and recreational landings and discards in numbers and weight (pounds). Describe the fraction of catch by fleet that is discarded.

4. Generate model parameter estimates and their variances, estimates of model uncertainties, and estimates of stock status and management benchmarks. In addition to the base model, conduct sensitivity analysis to address uncertainty in data inputs and model configuration and consider runs that represent plausible, alternate hypotheses about key parameters.
    - Use the following status determination criteria (SDC):
        - MSY proxy = yield at F_{MSY} or proxy ($F_{30\%SPR}$, Amendment 48)
        - Provide model outputs using alternative MSY proxies as justified by the life history and data available for the stock.
        - If overfished, MSY proxy = $F_{Rebuild}$
        - MSST = $0.5*SSB_{MSY}$ (Amendment 44)
        - MFMT = F_{MSY} and $F_{Rebuild}$ (if overfished)
        - OY = 90% of MSY or proxy (Amendment 48)
        - If different SDC are recommended, provide outputs for both the current and recommended SDC.
    - Unless otherwise recommended, use the geometric mean of the previous three years' fishing mortality to determine $F_{Current}$. If an alternative approach is recommended, provide justification and outputs for the current and alternative approach.
    - Provide yield and spawning stock biomass streams for the overfishing limit and acceptable biological catch in pounds:
        - Annually for five years
        - Under a "constant catch" scenario for both three and five years
        - For the equilibrium yield at F_{MSY}, when estimable

5. Develop a stock assessment report to address these TORs and fully document the input data and results of the stock assessment model.

Review Workshop Terms of Reference

1. Evaluate the data used in the assessment, including discussion of the strengths and weaknesses of data sources and decisions. Consider the following:
    - The context of the data availability in the region. Are the procedures appropriate for our data limitations?
    - Are data decisions made by the DW and AW justified?

- Are data uncertainties acknowledged, reported, and within normal or expected levels?
- Is the appropriate model applied properly to the available data?
- Are input data series sufficient to support the assessment approach?

2. Evaluate the data used in the assessment, including discussion of the strengths and weaknesses of data sources and decisions. Consider the following:
    - The context of the data availability in the region. Are the procedures appropriate for our data limitations?
    - Are data decisions made by the DW and AW justified?
    - Are data uncertainties acknowledged, reported, and within normal or expected levels?
    - Is the appropriate model applied properly to the available data?
    - Are input data series sufficient to support the assessment approach?
3. Evaluate and discuss the strengths and weaknesses of the methods used to assess the stock, considering the available data. Consider the following:
    - Are methods scientifically sound and robust?
    - Are priority modeling issues clearly stated and addressed?
    - Are the methods appropriate for the available data?
    - Are assessment models configured properly and used in a manner consistent with standard practices?
4. Consider how uncertainties are addressed in the assessment, and their potential consequences.
    - Comment on the degree to which methods used to evaluate uncertainty reflect and capture the significant sources of uncertainty in the population, data sources, and assessment methods.
    - Comment on the relationship of this variability with ecosystem or climate factors and mechanisms for encompassing this into management reference points.
5. Provide, or comment on, recommendations to improve the assessment.
    - 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.
    - If applicable, provide recommendations for improvement or for addressing any inadequacies identified in the data or assessment modeling. Describe these recommendations in sufficient detail for application, and should be practical for short term implementation (e.g., achievable within ~6 months). List longer-term recommendations as research recommendations above.
6. Evaluate the stock projections, including discussing strengths and weaknesses, and consider the following:
    - Are the methods consistent with accepted practices and available data?
    - Are the methods appropriate for the assessment model and outputs?
    - Are the results informative and robust, and are they useful to support inferences of probable future conditions?
    - Are key uncertainties acknowledged, discussed, and reflected in the projection results?
7. Prepare a Review Workshop Summary Report describing the Panel's evaluation of the stock assessment and addressing each Term of Reference.