SEDAR
SouthEast Data, Assessment, and Review
4055 Faber Place Drive, Suite 201, North Charleston, SC 29405
Phone: (843) 571-4366 Fax: (843) 769-4520 SEDARweb.org

SEDAR 79 Southeastern U.S. Mutton Snapper

Assessment Terms of Reference

Draft: September 2020

Data Workshop Terms of Reference

1. Review stock structure and unit stock definitions and consider whether changes are required.
2. Review, discuss, and tabulate available life history information.
   - Evaluate age, growth, natural mortality, and reproductive characteristics
   - Provide appropriate models to describe population growth, maturation, and fecundity by age, sex, and/or length by appropriate strata as feasible.
   - Evaluate the adequacy of available life history information for conducting stock assessments and recommend life history information for use in population modeling.
   - 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 all life history information.
3. Recommend discard mortality rates.
   - Review available research and published literature
   - Consider research directed at mutton snapper as well as similar species from the southeastern United States 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
   - Consider species identification issues between mutton snapper and other species, and correct for these instances as appropriate
   - 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

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- Recommend which data sources adequately and reliably represent population abundance for use in assessment modeling
- Provide appropriate measures of uncertainty for the abundance indices to be used in stock assessment models
- Rank the available indices with regard to their reliability and suitability for use in assessment modeling

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 fishery sector or gear
   - Provide length and age distributions for both landings and discards if feasible
   - Provide maps of fishery effort and harvest and fishery sector or gear
   - 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 and fishery sector or gear
   - Provide estimates of uncertainty around each set of landings and discard estimates
7. Identify and describe ecosystem, climate, species interactions, habitat considerations, and/or episodic events that would be reasonably expected to affect population dynamics.
8. Incorporate socioeconomic information into considerations of environmental events that affect stock status and related fishing effort and catch levels as practicable.
9. 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.
10. Review, evaluate, and report on the status and progress of all research recommendations listed in the last assessment, peer review reports, and SSC report concerning this stock.
11. 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).

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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.
   - 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 update assessment (SEDAR 15AU).
   - 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.
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 15AU) update assessment, and comment on the impacts of changes in data, assumptions or assessment methods on estimated population conditions
4. Characterize uncertainty in the assessment and estimated values.
   - Consider uncertainty in input data, modeling approach, and model configuration
   - Consider and include 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
5. Provide estimates of yield and productivity.
   - Include yield-per-recruit, spawner-per-recruit, and stock-recruitment models
6. Provide estimates of population benchmarks or management criteria consistent with 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
   - Recommend proxy values (e.g. MSY) when necessary, and provide appropriate justification

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- Compare and contrast reference values estimated in this assessment with values from the previous (SEDAR 15AU) update assessment, and comment on the impacts of changes in data, assumptions or assessment methods on reference point differences.
- Recommend definition of recent fishing mortality rates ($F_{Current}$) and recent spawning stock biomass ($SSB_{current}$) that will be compared to management benchmarks to determine management benchmarks.

7. Incorporate known applicable environmental covariates into the selected model, and provide justification for why any of those covariates cannot be included at the time of the assessment
8. Provide declarations of stock status relative to management benchmarks or alternative data poor approaches if necessary.
9. Provide uncertainty distributions 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.
10. Project future stock conditions (biomass, abundance, and exploitation) and develop rebuilding schedules if warranted; include estimated generation time.
    - Request estimates of retained landings in numbers and biomass from data providers for interim years between the terminal year and first year of the projections, if available, to be used to project future stock conditions. If estimates of retained landings are unavailable, use the average of the previous three years.
    - Stock projections (including yields) shall be developed in accordance with the following:

      A) If stock is overfished:
      $F=0$, $F_{Current}$, $F=F_{MSY}$, F at 75% of F_{MSY}, $F_{40\%SPR}$ (current definition of F_{OY})
      $F=F_{Rebuild}$ (max exploitation that rebuild in greatest allowed time)

      B) If overfishing is occurring:
      $F=F_{Current}$, $F=F_{MSY}$, F at 75% of F_{MSY}, $F_{40\%SPR}$

      C) If stock is neither overfished nor undergoing overfishing:
      $F=F_{Current}$, $F=F_{MSY}$, F at 75% of F_{MSY}, $F_{40\%SPR}$

      D) If data limitations preclude classic projections (i.e. A, B, C above), explore alternative models to provide management advice
11. Provide recommendations for future research and data collection.
    - Be as specific as practicable in describing sampling design and sampling intensity
    - Emphasize items that will improve future assessment capabilities and reliability
    - Consider data, monitoring, and assessment needs
12. Review, evaluate, and report on the status and progress of all research recommendations listed in the last assessment, peer review reports, and SSC report concerning this stock.

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13. Complete the Assessment Workshop Report in accordance with project schedule deadlines (Section III of the SEDAR Stock Assessment Report).

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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, and consider 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 input data series reliable and applied properly within the assessment model?
2. Evaluate and discuss the strengths and weaknesses of the methods used to assess the stock, taking into account the available data, and considering the following:
   a) Are methods scientifically sound and robust?
   b) Are assessment models configured properly and consistent with standard practices?
   c) Are the methods appropriate for the available data?
3. Evaluate the assessment findings and consider 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 reliable? If not, are there other indicators that may be used to inform managers about stock trends and conditions?
4. Evaluate the stock projections, including discussing strengths and weaknesses, and consider 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 the significant sources of uncertainty in the population, data sources, and assessment methods
   - Ensure that the implications of uncertainty in technical conclusions are clearly stated

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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. Consider whether the stock assessment constitutes the best scientific information available using the following criteria as appropriate: relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation, and peer review of fishery management information.
8. Provide suggestions on key improvements in data or modeling approaches that should be considered when scheduling the next assessment.
9. Prepare a Peer Review Summary summarizing the Panel's evaluation of the stock assessment and 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.

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Schedule of Events

Draft: September 2020

Project Schedule and ToRs Approved ..... January 2021
Workshop Appointments ..... April 2021

Data Scoping Webinar (DW Panel)..... *week of August 9th, 2021*
Unprocessed Data Deadline (*includes raw age and reproduction data*) ..... 1 October 2021
Data Webinar (DW Panel) ..... *week of October 11th, 2021*

- *Status update from WG/data providers*
- *Review summary statistics*
- *Discuss issues where panel feedback needed to prep for DW*

MRIP Estimates Due ..... **26 November 2021**
Preliminary Data Products Due ..... **17 December 2021**
DW Working Paper/Processed Data Submission to SEDAR Staff ..... 14 January 2022
Data Evaluation Workshop (St. Pete, FL)..... January 31 – February 4 2022
First Draft of Data Evaluation Workshop Report ..... 4 February 2022 (end of workshop)
Post data workshop webinar (DW Panel, if necessary) ..... *week of February 21st, 2022*
FINAL Data due to data compilers ..... 4 March, 2022
Draft DW Reports to DW panel for review & final working papers to SEDAR..... March 11, 2022
Report Comments due to Editors..... March 25, 2022
Final DW report sections due to SEDAR..... April 1, 2022
Data workshop report distribution ..... April 8, 2022
Final age and length compositions complete ..... April 11th

Pre-Assessment webinar (DW and AW Panels)..... *week of April 18th, 2022*

- *Discuss any remaining data issues and/or pre-modeling*

Assessment Milestone I webinar ..... *week of May 16th, 2022*

- *Consider methods and configuration options for models*
- *Recommend assessment methods (i.e. model classifications, packages) to pursue for potential base model configuration*
- *Identify likely issues to be addressed and evaluated in developing the base model*
- *Review and finalize any data changes or modifications since the DW*

Assessment Milestone II webinar..... *week of June 27th, 2022*

- *Progress report on base model development*

Assessment Milestone III webinar..... *week of August 1st, 2022*

- *Review base model alternatives and recommend a base model approach and configuration*
- *Recommend sensitivities and uncertainty evaluations*
- *Recommend projection approaches and configuration*

Assessment Milestone IV webinar .....*week of September 26th, 2022*

- *Review sensitivities and uncertainty evaluations*
- *Review projection results*
- *Review Assessment report and responses to ToRs*

AW working paper submission deadline ..... November 11, 2022
Assessment Report Draft to panel for review..... November 18, 2022
AW report comments due to analysts .....December 9, 2022
Final Assessment Report to SEDAR staff.....December 16, 2022

RW Working Paper Submission..... .January 3, 2023
Final Assessment Report distribution ..... January 3, 2023
Pre-RW Conference Call (Analytical team, RW Chair, if desired).....week of January 2nd, 2023
RW Panel Introductory Conference Call (RW Panel, Chair, if desired) .. week of January 9th, 2023
Review Workshop: (St. Petersburg, FL).....January 17-19, 2023
Draft Review Reports due to Chair..... February 3, 2023
Review Workshop Addenda/Revision Reports due to Chair and SEDAR ..... February 3, 2023
Review Workshop Reports due to SEDAR Staff .....February 10, 2023
Complete Assessment Report Submitted to Councils/SERO/SEFSC.....February 17, 2023