SEDAR

SouthEast Data, Assessment, and Review

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BENCHMARK ASSESSMENT: South Atlantic Cobia

Terms of Reference

Draft 20 June 2011

I. Data Workshop

1. Characterize stock structure and develop an appropriate stock definition. Provide maps of species and stock distribution.
2. Review, discuss and tabulate available life history information.
   - Provide appropriate models to describe 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
3. 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, addressing program objectives, methods, coverage (provide maps), sampling intensity, and other relevant characteristics
   - Develop CPUE and index values by appropriate strata (e.g., age, size, area, and fishery); provide measures of precision and accuracy
   - Evaluate the degree to which available indices adequately represent fishery and population conditions
   - Recommend which data sources are considered adequate for use in assessment modeling.
4. Characterize commercial and recreational catch.
   - Include both landings and discards, in pounds and number
   - Provide estimates of discard mortality rates by fishery and other strata as feasible
   - Evaluate and discuss the adequacy of available data for accurately characterizing harvest and discard by species and fishery sector
   - Provide length and age distributions if feasible, and maps of fishery effort and harvest
   - Provide a single table showing landings by sector in whole weight, using the methods developed by SEFSC for ACL tracking to estimate recreational landings by weight

5. Determine appropriate stock assessment models and/or other methods of evaluating stock status, determining yields, estimating appropriate population benchmarks, and making future projections that are suitable for making management decisions.
6. Provide recommendations for future research, including guidance on sampling design, intensity, and appropriate strata and coverage.
7. Develop a spreadsheet of assessment model input data that reflects the decisions and recommendations of the Data Workshop. Review and approve the contents of the input spreadsheet by TBD.
8. Prepare the Data Workshop report providing complete documentation of workshop actions and decisions (Section II of the SEDAR assessment report), and develop a list of tasks to be completed following the workshop.

II. Assessment Process

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.
    - Consider multiple models, including multispecies models, if data limitations preclude single species assessments
    - ***Consider a model approach that can be applied to Gulf and Atlantic cobia.***
    - Recommend models and configurations considered most reliable or useful for providing advice
    - Document all input data, assumptions, and equations for each model prepared
3. Provide estimates of stock population parameters.
    - Include fishing mortality, abundance, biomass, selectivity, and other parameters as appropriate given data availability and modeling approaches
    - Include appropriate and representative measures of precision for parameter estimates
4. Characterize uncertainty in the assessment and estimated values.
    - Consider uncertainty in input data, modeling approach, and model configuration
    - Consider other sources as appropriate for this assessment
    - Provide appropriate measures of model performance, reliability, and 'goodness of fit'
5. Provide evaluations of yield and productivity
    - Include yield-per-recruit, spawner-per-recruit, and stock-recruitment evaluations
6. 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.
    - Evaluate existing or proposed management criteria as specified in the management summary
    - Recommend proxy values when necessary
7. Provide declarations of stock status relative to management benchmarks or, if necessary, alternative data-poor approaches.
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, landings, discards 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=Fmsy, Ftarget,
F=Frebuild (max that rebuilds in allowed time)

B) If stock is overfishing:
F=Fcurrent, F=Fmsy, F= Ftarget

C) If stock is neither overfished nor overfishing:
F=Fcurrent, F=Fmsy, F=Ftarget

D) If data-limitations preclude classic projections (i.e. A, B, C 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. Prepare an accessible, documented, labeled, and formatted spreadsheet containing all model parameter estimates and all relevant population information resulting from model estimates and any projection and simulation exercises. Include all data included in assessment report tables and all data that support assessment workshop figures.
12. Complete the Assessment Workshop Report for Review (Section III of the SEDAR Stock Assessment Report).

III. Review Workshop

1. Evaluate the quality and applicability of data used in the assessment.
2. Evaluate the quality and applicability of methods used to assess the stock.
3. Evaluate the assessment with respect to the following:
    - Is the stock overfished? What information helps you reach this conclusion?
    - Is the stock undergoing overfishing? What information helps you reach this conclusion?
    - Is there an informative stock recruitment relationship? Is the stock recruitment curve reliable and useful for evaluation of productivity and future stock conditions?
    - Are 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 condition?
4. Evaluate the adequacy, appropriateness, and application of the methods used to project future population status with regard to accepted practices and data available for this assessment.
5. If there are significant changes to the base model, or to the choice of alternate states of nature, then provide a probability distribution function for the base model, or a combination of models that represent alternate states of nature, presented for review. Provide justification for the weightings used in producing the combinations of models.
6. Consider how uncertainties in the assessment, and their potential consequences, have been addressed.
    - Comment on the degree to which methods used to evaluate uncertainty reflect and capture the significant sources of uncertainty.
    - Ensure that the implications of uncertainty in technical conclusions are clearly stated.
7. Consider the research recommendations provided by the Data and Assessment workshops and make any additional recommendations or prioritizations warranted.
    - Clearly denote research and monitoring needs that could improve the reliability of, and information provided by, future assessments.
8. 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.

The review panel may request additional sensitivity analyses, evaluation of alternative assumptions, and correction of errors identified in the assessments provided by the assessment workshop panel; the review panel may not request a new assessment. Additional details regarding the latitude given the review panel to deviate from assessments provided by the assessment workshop panel are provided in the SEDAR Guidelines and the SEDAR Review Panel Overview and Instructions.

** The panel shall ensure that corrected estimates are provided by addenda to the assessment report in the event corrections are made in the assessment, alternative model configurations are recommended, or additional analyses are prepared as a result of review panel findings regarding the TORs above.**