

***SEDAR* Guidelines**

SouthEast Data, Assessment, and Review

A Cooperative Stock Assessment Development Program of:

**NOAA Fisheries Southeast Fisheries Science Center
NOAA Fisheries Southeast Regional Office
South Atlantic Fishery Management Council
Gulf of Mexico Fishery Management Council
Caribbean Fishery Management Council
Atlantic States Marine Fisheries Commission
Gulf States Marine Fisheries Commission**

**One Southpark Circle # 306
Charleston, SC 29407**

August 27, 2004

I. Introduction

The SouthEast Data, Assessment, and Review (SEDAR) process is a Council process initiated to improve the quality and reliability of stock assessments for fishery resources in the southeastern United States, including the South Atlantic, Gulf of Mexico, and Caribbean. SEDAR is managed by the three Regional Fishery Management Councils in close coordination with NOAA Fisheries and the Interstate Fishery Commissions (ASMFC and GSMFC). SEDAR will benefit greatly from the expertise of existing stock assessment-related committees and panels of the Councils and Commissions. However, SEDAR seeks to achieve continual improvements in the scientific caliber of stock assessments and their continued relevance to existing and emerging fishery management issues. SEDAR therefore, places special emphasis on increasing constituent/stakeholder participation in assessment development and ensuring a rigorous and independent scientific review of completed stock assessments. SEDAR incorporates a two-year planning cycle to facilitate the timely execution of critical data collection activities, population dynamics model development, and stock evaluation exercises.

The following material outlines how the South Atlantic, Caribbean, and Gulf of Mexico Fishery Management Councils plan to integrate the SEDAR process into their fishery management planning processes. The SEFSC is participating in the SEDAR process for preparing assessments for the Councils. Each Council developed a SEDAR Advisory Panel composed of (1) a pool of scientists from their Scientific & Statistical Committees, Assessment Panels, and other committees/panels; (2) a pool of individuals from their Advisory Panels; (3) a pool of individuals from the environmental community active in each Council area; and (4) a pool of other individuals that may be asked to participate in the SEDAR Process (e.g., State, University, and Commission scientists).

The product of the SEDAR process is a stock assessment report to the Council. The SEDAR assessment report is analogous to the assessment reports previously prepared by the SAPs and/or NOAA Fisheries as outlined under some framework procedures. The final assessment report must specify management parameters required under the Magnuson-Stevens Act, Council FMP's, or framework procedures. Specific parameters to be provided by an assessment are listed in the Terms of Reference developed for each SEDAR Workshop. Each Council is modifying their framework procedures to replace the SAP (or other groups) actions with the Council/NOAA Fisheries SEDAR process actions.

II. Overview of SEDAR and its Relationship to Existing Council/Commission Committees and Panels

The process of generating a stock assessment through SEDAR is termed a 'cycle'. Each SEDAR cycle is comprised of three workshops that are conducted sequentially: 1) The Data Workshop -- involves the assembly and review of all available fishery data and life history information, resulting in consensus databases to be used in stock assessments. Analytical techniques and models appropriate for the available data are also suggested. 2) The Assessment Workshop -- data sets from the Data Workshop are used with population dynamics modeling techniques to determine the status of stocks; and 3) Review Workshop -- an independent peer review of the stock assessment by scientists, industry representatives and environmental representatives is conducted. SEDAR Workshop Reports, along with the review of these Reports by specific Council/Commission committees and panels (e.g., Socioeconomic Panel, Scientific and Statistical Committee (and sub-committees and Advisory Panel), will be provided to the Council for their consideration in determining appropriate fishery management measures.

III. Planning

Policy decisions, negotiation of SEDAR guidelines and species to be assessed, and cycle timing are established by the SEDAR Steering Committee. The Steering Committee is composed of the NOAA Fisheries Southeast Science Center Director; NOAA Fisheries Southeast Regional Administrator; Executive Directors of the South Atlantic, Gulf of Mexico and Caribbean Fishery Management Councils; Chairs of the South Atlantic, Gulf of Mexico and Caribbean Fishery Management Councils; and the Executive Directors of the Atlantic and Gulf States Marine Fisheries Commissions. Designees may attend Steering Committee meetings in place of these individuals. The Steering Committee shall elect a chair from the membership. Individuals currently serving on the committee are as follows:

Dr. Nancy Thompson, NOAA Fisheries SEFSC
 Dr. Roy Crabtree, NOAA Fisheries SERO
 Bob Mahood, SAFMC Executive Director
 Wayne Swingle, GMFMC Executive Director
 Miguel Rolon, CFMC Executive Director
 Vince O'Shea, ASMFC Executive Director
 Larry Simpson, GSMFC Executive Director
 David Cupka, SAFMC Chair
 Bobbi Walker, GMFMC Chair
 Eugenio Piñero-Soler, CFMC Chair

The SEDAR Steering Committee will meet at least twice annually to schedule the specific assessments that will go through the SEDAR process. Assessments are scheduled up to two years in advance. Advanced planning allows researchers to develop updated inputs and assess appropriate techniques and models for use in assessments. The

committee also reviews progress on SEDAR assessments and recommends modifications of the SEDAR Process.

The South Atlantic Council is funded by the SEFSC to administer the SEDAR process for the southeast region. The South Atlantic Council hired a SEDAR coordinator and provides administrative support. SEDAR staff is responsible for the administrative duties of SEDAR, with administrative assistance provided by South Atlantic Council administrative staff for duties such as lodging and meeting contracts, travel reimbursements under the SEDAR grant, meeting support, and meeting materials distribution. The SEDAR Coordinator chairs the data and assessment workshops and supports the review workshops. Scheduling of SEDAR workshops, developing attendee lists, and making arrangements for workshops is done collaboratively by SEDAR staff and the SEDAR Steering Committee.

Each Steering Committee member designates a staff person (if not themselves) responsible for ensuring appointments to panels are made promptly and that their participants meet deadlines. Each Council establishes guidelines and procedures for appointing individuals from its SEDAR Advisory Panel to participate in SEDAR workshop panels; these procedures need not be identical for each Council. Each Council covers the travel expenses for their Advisory Panel, Assessment Panel, SSC, Council, and Staff representatives. Participants from NGO's, the fishing community, and outside public and peer-reviewer travel expenses are paid through the administrative grant to the South Atlantic Council. Invitations to participants in SEDAR workshops are issued by each Council to the participants that Council appoints.

All workshops are open to the public, noticed in the Federal Register, and recorded. SEDAR staff is responsible for submitting Federal Register Notices. Each Council may provide further notice through any means deemed appropriate, such as press releases, newsletters, or website notices.

IV. SEDAR Cycle Scheduling and Workload

SEDAR goals are to improve the quality of stock assessment products for the Southeast Region, increase and broaden participation in generating stock assessments, and provide managers and constituents greater confidence in assessment results. Primary changes from the past assessment development process include the addition of a Data Workshop and a Review Workshop which involve many participants. Additional workshops and broader participation increase time demands on federal and state agencies as well as constituent representatives. The trade-off is an improved product, or as stated succinctly by those who conceived the SEDAR concept, "SEDAR produces better assessments, not necessarily faster assessments". Although SEDAR places less burden and responsibility on individuals in developing complete stock assessments, it increases the burden and responsibility on the collective assessment and technical expertise of the region to generate, verify, and review the many pieces that contribute to an assessment.

SEDAR Steering Committee guidance regarding schedules, workload, and assessment updates is summarized below. Complete details and justification are provided in Appendix E.

A. Scheduling

Experience proves that a SEDAR cycle can be reasonably completed in six months. (This is of course not counting the time that may be necessary for tasks such as research projects, data entry, or age structure interpretation). Spreading the workshops over time allows participants to complete SEDAR tasks without excessive detriment to other responsibilities. An extended period also eases scheduling burdens and prevents overlapping of SEDAR workshops with other meetings, such as those of the Councils and Commissions in the Region that are also competing for the time of agency technical staff and constituent representatives. Experience also proves that SEDAR cycles should not overlap – one should be completed before another begins. This ensures that preparations for one cycle do not interfere with another cycle.

A general schedule can be developed based on the preparation time needed before and after each workshop. Approximately 6 to 8 weeks prior to the first meeting, the Data Workshop, analysts and data collectors will begin drafting issue papers and preparing data for submission. The Data Workshop requires a weeklong meeting, and additional time over the following weeks to finalize the report. Once the Data Workshop report is complete and the datasets are finalized, the assessment analysts can begin preliminary model development and draft issue papers describing model options. Approximately two months are needed between the Data and Assessment Workshops to complete these tasks. The Assessment Workshop requires another weeklong meeting, followed by approximately 4 weeks to finalize the report, complete any subsequent analyses, and produce the necessary figures and tables. The Assessment Report should be finalized for distribution to the Review Panelists 2 weeks before the Review Workshop. The Review Workshop requires a weeklong meeting, followed by 2-3 weeks to finalize the report.

SEDAR scheduling is based on 2 annual cycles, loosely following a calendar year, with a Spring cycle running from January – June and a Fall cycle running from July – December. Data Workshops of one cycle will be scheduled approximately 6-8 weeks following the Review Workshop of the previous cycle. Actual dates will be determined by the Steering Committee and based on Council meeting schedules and SEFSC obligations.

B. Workload

SEDAR cycles will be limited to at most 2 complete benchmark assessments. This may involve a single species with multiple management units or stocks, as in the case of king or Spanish mackerel, or separate species if they are closely related based on life history or fisheries. SEDAR cycles will typically be devoted to a single Council. Exceptions may occur with those stocks or stock units managed by more than one Council, such as king and Spanish Mackerel where there is a joint Gulf-South Atlantic FMP and each Council has jurisdiction over a particular migratory unit. Additional related species may occasionally be added to Data Workshops to document their data quality or identify research and monitoring needs, and additional assessments completed by State agencies or the Interstate Commissions may be added to Review Workshops. A cycle may be devoted to a single assessment if the assessment is expected to be particularly complex or controversial.

C. Assessment Updates

SEDAR assessments are considered benchmarks and should be solicited for the most pressing management issues or first time assessments. Once an assessment has been approved by SEDAR, the basic framework of input data and model configuration may be updated in the future by adding additional years of data. Such assessment updates may be reviewed by Council Advisory Panels, such as the SSC's or assessment panels, with specific details of preparation and review determined by the appropriate Council.

V. SEDAR Workshops

A. Data Workshop

Data Workshop participants assemble and review all available fishery data, monitoring programs, and life history information, producing consensus databases used to conduct stock assessments. Analytical techniques appropriate for the available datasets are recommended for the Assessment Workshop. Data Workshop decisions and recommendations are documented in the SEDAR Assessment Report. Data formats and documentation guidelines are distributed in advance, and some preliminary analyses of the data are conducted prior to the workshop.

Data Workshop participants include database managers; data specialists; data collectors; life history researchers; stock assessment scientists from States, NOAA Fisheries, Commission, universities, independent laboratories and institutions; and Council representatives (advisory panel leaders or chairs: commercial, recreational, NGO, staff and Council members). The SEDAR coordinator will serve as the Data Workshop Chairperson and will lead discussions to 1) reach consensus on the best available data for use in assessing stocks under consideration and 2) provide recommendations on possible modeling and analytical techniques given the data sets reviewed. The NMFS Technical Guidance Document will be used for assessing the status of data poor species.

Data Workshops are structured around smaller working groups dedicated to particular data issues, such as commercial statistics, recreational statistics, life history, and abundance indices. Specific groups are determined based on the needs of the candidate species. Participants are assigned to workgroups in advance, based on their particular skills, experience, and expertise. Each group includes someone experienced in assessment modeling. A leader appointed for each workgroup is responsible for recording Panel discussions and decisions on their workgroups data charge and ensuring that relevant report sections are drafted.

The first segment of the data workshop involves brief presentations of submitted working papers and data sources. Presentations focus on data coverage, analytical methods, and identification of issues needing resolution by the Panel. The second segment involves a mixture of breakout sessions in which workgroups identify potential solutions to data issues and plenary sessions where the Panel convenes to decide appropriate solutions to each issue. The final segment involves drafting and reviewing the workshop report.

The charge to the Data Workshop is guided by the following Terms of Reference (the Councils, Commissions, States, and NOAA Fisheries may also develop specific Terms of Reference to be addressed during the Data Workshop):

1. Determine quality and appropriateness of life-history information (stock structure, aging, size at age, sex ratio including transition, maturity, fecundity, and generation time, age protocols and determination, catch aging methods).
2. Determine quality and appropriateness of abundance indices (MARMAP, SEAMAP, headboat CPUE, commercial logbook CPUE, etc.).
3. Determine quality and appropriateness of fishery-dependent data (landings, discards, release mortality, and length characterization).
4. Determine quality and appropriateness of available data for estimating impacts from proposed or existing management measures.
5. Provide recommendations on possible assessment methods and appropriate models given the quality and scope of the data sets reviewed.
6. Provide recommendations for future research (field and assessment).

Workgroup products are expected to include: (i) time series of total removals (in weight) by fishery; (ii) age and length samples from fishery dependent and independent sources; (iii) abundance indices, including fishery-dependent or fishery-independent indices or both; (iv) time series of estimated release mortalities; (v) estimate(s) of natural mortality; (vi) maturity or fecundity schedule; (vii) growth models for length and weight; (viii) length–weight relationship; and (ix) sex ratios at age.

The Data Workshop Panel is responsible for completing section II of the SEDAR Stock Assessment Report. A Workshop Rapporteur is appointed from among the participants to coordinate and edit the Report. The Rapporteur is responsible for submitting the report section to the SEDAR Coordinator by the deadline specified by the SEDAR Steering Committee. Appendix A contains a sample report with outline, content, and format guidance.

Workgroup participants should bring the following to the meeting: a laptop computer for data manipulation, analysis, and text drafting; any relevant data contributions (in metric units) in computer-readable form (if data are not delivered prior to the workshop); and a brief technical document summarizing and describing their data (if not provided prior to the workshop). Technical documents should be paginated and should be prefaced with title, date, and authors' names, and numbered in accordance with specifications outlined for the SEDAR Technical Document Series (Appendix C). Electronic copies should be submitted for subsequent distribution on CD and Internet posting. The SEDAR Steering Committee and SEDAR Coordinator establish deadlines for document submission. SEDAR staff distributes documents to workshop participants, typically two weeks prior to the workshop.

In general, the Data Workshop should occur at least 2 months prior to the Stock Assessment Workshop to allow time for the team of lead assessment analysts to develop the initial model runs and sensitivity evaluations.

B. Assessment Workshop

Participants at the Assessment Workshop conduct stock assessments, prepare stock rebuilding analyses, and estimate population benchmarks. Specific assessment methods vary and are based on the level of available data. The NMFS Technical Guidance Document is used for assessing the status of data poor species.

Assessment Workshop participants include NOAA Fisheries stock assessment scientists, Commission/State/university/independent assessment scientists, biologists representing interest groups (commercial, recreational, NGO), Council advisory panels (commercial, recreational, and/or NGO) representatives, Scientific & Statistical Committees, Council staff and Council members. Stock Assessment Workshop participants are appointed from each Councils' SEDAR Advisory Panel. Participants perform functions outlined in various Council FMP framework procedures, including producing an assessment report, and recommending ABC, B(msy), F(msy), MSST, MFMT, etc. to meet SFA requirements. The SEDAR Coordinator serves as Chairperson. Assessment Workshop products are based on the Sustainable Fisheries Act and the National Standards. The charge to the Assessment Workshop is guided by the following Terms of Reference (the Councils, Commissions, States, and NOAA Fisheries may also develop specific Terms of Reference to be addressed during the Assessment Workshop):

1. Identify modeling approaches appropriate to the available data and management questions ranging from simple trends analyses (e.g., trends in catches, average size, CPUE, etc.) to more complex modeling (e.g., production models, age-structured models, size-structured models, hybrids, etc.).
2. Determine suitability of current proxies for SFA benchmarks and suitable approaches for estimating actual SFA benchmarks.
3. Estimate stock status (biomass) and fishery status (fishing mortality rate) relative to appropriate SFA benchmarks. Is the stock overfished; is overfishing occurring?
4. Identify and conduct rebuilding analyses comparing management options from existing or proposed actions for stocks that are overfished.
5. Provide recommendations for future research and data collection (field and assessment).

Participants should bring the following to the meeting: a laptop computer for data manipulation and modeling; all necessary software to read and adjust data and apply any models proposed by the participant; and a brief technical document summarizing any modeling approach proposed by the participant. Technical documents should be paginated and should be prefaced with title, date, and authors' names, and numbered in accordance with specifications outlined for the SEDAR Technical Document Series (Appendix C). Electronic copies should be submitted for subsequent distribution on CD and Internet posting. The SEDAR Steering Committee and SEDAR Coordinator establish deadlines for document submission. SEDAR staff distributes documents to workshop participants, typically two weeks prior to the workshop.

The Assessment Workshop Panel is responsible for drafting section III of the SEDAR Stock Assessment Report. The Workshop Rapporteur is charged with editing and compiling the document section, and submitting it to the SEDAR Coordinator by the deadline specified by the SEDAR Steering Committee.

A written draft report, providing an overview of the analyses, general findings, and recommendations of the workshop, is available by conclusion of the workshop. This report may be expanded following the workshop and finalized after the Review Workshop. Appendix A contains a sample report with format, contents, etc.

C. Review Workshop

The Review Workshop is an independent peer review of the stock assessment. Review Workshop participants include assessment scientists, industry/Advisory Panel representatives, and NGO representatives. Core participants include scientists from NOAA Fisheries, Council SEDAR Advisory Panels, and representatives from the Center for Independent Experts (CIE representatives are contracted by and paid for by NOAA Fisheries, separate from the administrative funding provided for SEDAR). A representative of the CIE serves as Chair.

The Review Workshop Panel is strictly independent. Those who participate as panelists at the Data or Assessment Workshop of the assessment under review, those with any direct involvement in developing an assessment presented to a particular workshop as part of the assessment under review, or those with any direct involvement in the decision process for the species of concern are not eligible to serve as Review Workshop Panelists.

Review Workshop Panelists receive the Assessment Report, including sections prepared by the Data and Assessment workshops; supplemental analytical materials including working papers and reference documents; and consensus data sets for their review at least two weeks prior to the review meeting. The charge to the Review Workshop is guided by the following Terms of Reference (the Councils, Commissions, States, and NOAA Fisheries may also develop specific Terms of Reference to be addressed during the Review Workshop):

1. Evaluate the adequacy and appropriateness of all data used in the assessment. State whether or not the data are scientifically sound and the best available.
2. Evaluate the adequacy, appropriateness, and application of the methods used to estimate population parameters such as abundance, biomass, and exploitation. State whether or not the methods are scientifically sound and the best available, and recommend appropriate values of population parameters.
3. Evaluate the adequacy, appropriateness, and application of the methods used to estimate population benchmarks (MSY, Fmsy, Bmsy, MSST, MFMT, etc.). State whether or not the methods are scientifically sound and the best available, and recommend appropriate values for benchmark criteria.
4. Evaluate the adequacy, appropriateness, and application of the methods used to project future population status and, if appropriate, evaluate stock rebuilding. State whether or not the methods are scientifically sound and the best available, and recommend probable values of future population condition and status.
5. Develop recommendations for improving data collection, assessment, and future research (both field and assessment)

The Review Panel develops two reports:

1) A Consensus Stock Assessment Report that summarizes the peer review panel's evaluation of the stock assessment resulting from the assessment workshop,

2) An Advisory Report including a summary of stock status and forecast for the upcoming year.

(Appendix B contains sample reports with format and contents).

The Review Panel Chair is responsible for compiling and editing the report, and submitting it to the SEDAR Coordinator by a deadline specified by the SEDAR Steering Committee. The Chair and SEDAR Coordinator may appoint a Panel Leader for each assessment under review from among the Review Panelists to assist in drafting the report and documenting panel decisions. The Councils and SEFSC are encouraged to provide a rapporteur from outside the Review Panel membership to take notes on the discussions so that Panelists are not distracted during discussions and to further assist in drafting the report sections.

The Review Panel is not instructed to provide specific management advice. Such advice will be provided following completion of the review and through existing Council Committees, such as the Science and Statistical Committee.

D. General Workshop Responsibilities

SEDAR staff works with SAFMC administrative staff to secure meeting and lodging space for the workshops and provide staff support for the workshops.

SEDAR staff distributes meeting materials.

The lead Council or Councils for each SEDAR cycle appoint workshop participants from their SEDAR Advisory Panel.

Each Council distributes invitations for the participants whom they appoint and travel orders to the participants for whom they cover travel expenses.

SEDAR and SAFMC staff distribute travel orders for those traveling under the SEDAR grant.

The lead Council or Councils for each SEDAR cycle are responsible for reviewing and approving the specific Terms of Reference for each workshop in the cycle. This may be handled by the Council or Council staff, in cooperation with the SEDAR coordinator to provide consistency in language and formatting.

VI. Proposed and Potential Roles of Existing Council/Commission Committees and Panels under the SEDAR process

Given the extent to which SEDAR relies on Council/Commission committees and panels in the preparation and review of SEDAR Reports, a clear distinction is maintained between those who prepare and those who review SEDAR Reports. Each Council reviews the products of SEDAR stock assessments in accordance with its rules and procedures. For the Interstate Commissions, SEDAR provides a source of independent peer review of stock assessment products.

A. Councils

The Council Assessment and SSC Committee members are included SEDAR workshops and perform the functions currently outlined in a number of the Council FMP frameworks. This includes producing an assessment report and recommending management and SFA parameters such as ABC, Bmsy, Fmsy, MFMT, MSST as necessary to meet SFA requirements. SEDAR reports may serve as the assessment reports, avoiding the need for Council Committees to draft additional, separate reports. NOAA General Consul recommends that future FMP's and Amendments incorporate the SEDAR process, as outlined in these Guidelines, as the source of assessment information and SFA criteria.

NOAA Fisheries Economic Division, Council Socioeconomic Panels and SSC Sub-Committees (consisting of social scientists and economists) prepare any necessary reports assessing the social and economic impacts of various management measures that may result from SEDAR stock assessments. Such reports are prepared once the SEDAR assessment is final and the Council's SSC or Assessment Committee's make management recommendations. Each Council follows its rules and procedures for generating social and economic advice.

Council standing Scientific and Statistical Committees, in accordance with Section 302 of the Magnuson-Stevens Act, "assist in the development, collection, and evaluation of such statistical, biological, economic, social, and other scientific information as is relevant to such Council's development and amendment of any fishery management plan". SEDAR Assessment Reports, Review Panel Reports, and supporting documents submitted and prepared during the Workshops are provided to the appropriate Council for SSC review. Specific guidance for SSC review is provided by each Council. In general, the SSC reviews the Assessment Report, any socioeconomic reports, and the Review Panel reports. The SSC comments on the scientific adequacy of the SEDAR assessment, recommends TAC and management measures that consider both biological and socioeconomic analyses, and recommends future scientific research and data needs. The SSC makes a recommendation to the Council as to whether the reports represent the best available scientific information.

Advisory Panels (AP) consist of commercial and recreational fishermen and NGO representatives. Under SEDAR's principle of enhanced participation, increased NGO representation is desired; Councils are encouraged to accomplish this through appointments to each their SEDAR AP. Advisory Panels review the Assessment Report, socioeconomic reports, and the Review Panel Consensus Summary and Advisory Report and make management recommendations in accordance with each Council's rules and procedures.

B. Interstate Commissions

The Atlantic States Marine Fisheries Commission's Stock Assessment Committee reviewed the Commission's internal process for conducting stock assessments in relation to SEDAR, and recommended that data workshop and stock assessment workshops become a standard part of the Commission stock assessment process. The additional input that SEDAR provides from both data holders and stakeholders will improve buy-in and transparency from the earliest part of the assessment process. ASMFC technical committees or stock assessment subcommittees conduct assessment workshops with an expanded number of participants. Federal, state, university, industry, and other outside experts are invited to participate in evaluating the data inputs to the model, as well as conducting the assessment model. Assessments prepared through ASMFC may be reviewed by SEDAR Review Workshop Panels.

VII. Public Participation

SEDAR is a Council process, and as such, public participation is encouraged. SEDAR meetings are open to the public and advertised by the Councils and through the Federal Register. Public participation during SEDAR workshops is handled similar to current Council technical and committee meetings, in that no formal period of public testimony is scheduled. Instead, the Chair is free to call on the public for comment as necessary and appropriate during workshop deliberations. During all workshops, interested parties are permitted to comment on discussion items as the meeting proceeds. Written comments are handled in accordance with guidelines established by each Council.

VIII. Conclusion

By completing the SEDAR process and reviewing SEDAR Reports through Council Committees and Advisory Panels, the Councils, Commissions, States, and NOAA Fisheries ensure the relevance and scientific credibility of the data, analyses, reports, and summary findings for species and stocks assessed.

Appendix A. SEDAR Assessment Report Outline

The following outlines the contents and organization of the SEDAR Assessment Report. The report is composed of a single document, including all text, figures, and tables, to simplify information transfer and reduce tracking problems. Use of a standard format provides consistency between workshops and SEDAR cycles. The report is separated into three sections: the first summarizes the SEDAR process and documents the charge, conduct, and participants of each workshop and is drafted by the SEDAR Coordinator; the second documents input data and is drafted by the Data Workshop Panel; and the third documents the assessment methods and results and is drafted by the Assessment Workshop Panel. Species that undergo data review but not assessment are documented in individual species reports following the format of Section I. In the event a particular SEDAR cycle address multiple species, the workshop participants may decide whether it is best to include all species in one single report or to develop multiple reports devoted single species.

SEDAR Stock Assessment Report Outline

I. Introduction

(Developed by SEDAR, Council, NOAA Fisheries Staff prior to Data Workshop)

- i. Cover Page
- ii. Table of Contents
- iii. List of Tables
- iv. List of Figures

- 1. SEDAR Process
- 2. Management Overview
 - 2.1 Management Unit Definition
 - 2.2 Regulatory History
- 3. Assessment History

SEDAR STAFF
COUNCIL/SERO STAFF

LEAD ASSESSMENT AGENCY

II. Data Workshop Report

(Developed by Data Workshop Panel)

- i. Cover Page
- ii. Table of Contents
- iii. List of Tables
- iv. List of Figures

1. Introduction

- 1.1. Workshop Time and Place
- 1.2. Terms of Reference
- 1.3. List of Participants
- 1.4. List of Data Workshop Working Papers

2. Life History

- 2.1. Natural Mortality
- 2.2. Age
- 2.3. Growth
- 2.4. Reproduction
- 2.5. Stock Definition and Description

3. Fishery Descriptions and Data Sources

- 3.1. Commercial (May be further divided by gears)
 - 3.1.1. Overview
 - 3.1.2. Commercial Landings
 - 3.1.3. Commercial Discards
 - 3.1.4. Commercial Sampling Intensity
 - 3.1.5. Commercial Catch-at-Age/Length
- 3.2. Recreational (May be further divided by Sectors, e.g., headboat, private, charter)
 - 3.2.1. Overview
 - 3.2.2. Recreational Landings
 - 3.2.3. Recreational Discards
 - 3.2.4. Recreational Sampling Intensity
 - 3.2.5. Recreational Catch-at-Age/Length

4. Fishery-Dependent Survey Data

- 4.1. Description of Survey (to 4.x where x= # of Surveys)
 - 4.1.1. Methods, Gears, and Coverage
 - 4.1.2. Sampling Intensity – Time Series
 - 4.1.3. Size/Age data
 - 4.1.4. Catch Rates – Number and Biomass

- 4.1.5. Uncertainty and Measures of Precision
- 5. Fishery-Independent Survey Data
 - 5.1. Description of Survey (to 4.x where x= # of Surveys)
 - 5.1.1. Methods, Gears, and Coverage
 - 5.1.2. Sampling Intensity – Time Series
 - 5.1.3. Size/Age data
 - 5.1.4. Catch Rates – Number and Biomass
 - 5.1.5. Uncertainty and Measures of Precision
- 6. Research Recommendations
- 7. Literature Cited
- 8. Tables
- 9. Figures

III. Stock Assessment Workshop Report

(Developed by Assessment Workshop Panel)

(If multiple assessments are produced from a single data workshop report, each should have a dedicated Assessment Report (section III) denoted by letter, e.g. III.A, III.B)

- i. Cover Page
- ii. Table of Contents
- iii. List of Tables
- iv. List of Figures
- 1. Introduction
 - 1.1. Workshop Time and Place
 - 1.2. Terms of Reference
 - 1.3. List of Participants
 - 1.4. List of Assessment Workshop Working Papers
- 2. Data Issues and Deviations from Data Workshop Recommendations
- 3. Stock Assessment Models and Results
 - 3.1. Model 1 (Up to 3.X, where X = # models considered)
 - 3.1.1. Model 1 Methods
 - 3.1.1.1. Overview
 - 3.1.1.2. Data Sources
 - 3.1.1.3. Model Configuration and Equations
 - 3.1.1.4. Parameters Estimated
 - 3.1.1.5. Uncertainty and Measures of Precision
 - 3.1.2. Model 1 Results
 - 3.1.2.1. Measures of Overall Model Fit
 - 3.1.2.2. Parameter estimates
 - 3.1.2.3. Stock Abundance and Recruitment
 - 3.1.2.4. Stock Biomass (total and spawning stock)
 - 3.1.2.5. Fishery Selectivity
 - 3.1.2.6. Fishing Mortality
 - 3.1.2.7. Stock-Recruitment Parameters
 - 3.1.2.8. Measures of Parameter Uncertainty
 - 3.1.2.9. Retrospective and Sensitivity Analyses
- 4. Models Comparison
 - 4.1. Compare and Contrast Models Considered
 - 4.2. Preferred Model Recommendation

5. Population Modeling
 - 5.1. Yield per Recruit Models
 - 5.1.1. Methods
 - 5.1.2. Results
 - 5.2. Stock-Recruitment Models
 - 5.2.1. Methods
 - 5.2.2. Results
 - 5.3. Other Methods Considered
 - 5.3.1. Methods
 - 5.3.2. Results
6. Biological Reference Points (SFA Parameters)
 - 6.1. Existing Definitions and Standards
 - 6.2. Estimation Methods
 - 6.3. Results
 - 6.3.1. Overfishing Definitions and Recommendations
 - 6.3.2. Overfished Definitions and Recommendations
 - 6.3.3. Control Rule and Recommendations
 - 6.4. Status of Stock Declarations
7. Projections and Management Impacts
 - 7.1. Projection Methods and Assumptions
 - 7.2. Results
 - Abundance, Biomass, Exploitation, Stock Status, Yield,*
 - 7.2.1. Projection at $F=0$
 - 7.2.2. Projection at F current
 - 7.2.3. Projection at F target
 - 7.2.4. Projection at F_{msy}
 - 7.2.5. Projection at $0.5 * F_{msy}$
8. Management Outcomes and Risk Analysis
 - 8.1. Impacts of Current Management Program
 - 8.2. Impacts of Potential Alternative Actions
9. Research Recommendations
10. Literature Cited
11. Tables
12. Figures

IV. Review Workshop Report

(Developed by Review Workshop Panel)

- i. Cover Page
- ii. Table of Contents
1. Introduction
 - 1.1. Workshop Time and Place
 - 1.2. Terms of Reference
 - 1.3. List of Participants
 - 1.4. List of Review Workshop Working Papers
2. Consensus Reports
 - 2.1. Species 1
 - 2.2. Species 2
 - 2.n Species N

SEDAR ASSESSMENT REPORT DESIRED TABLES

All input data and model configuration information should be included in the assessment report in tabular form. Figures should be used to support the assessment and describe the input data, but no input data shall be presented solely in figure format. Large datasets such as length distributions or age-length keys may be included as appendices. Preliminary work and accessory tables in working papers may also be cited. However, all information required as input data for the assessment model shall be listed in the report tables in the level of detail required for the assessment. The basic rule of thumb to follow is that the assessment report should contain all data necessary to duplicate the stock assessment.

The following list indicates the general information to be included in the tables of the assessment report. In some instances the list may include information (such as fecundity) or suggest a level of detail (such as ‘by age’) that is not feasible given the available data. Several listed items may be included in a single table. It is recognized that the specifics of each table can and will vary by assessment. The required reporting detail will be dictated by both data availability and modeling approach. For example, if the assessment model is based on annual landings at length by gear, then the report must include a table of landings by gear, year, and length class. Further, a model based on length may require that life history characteristics such as mean weight be reported by length class as well as age. Fisheries that have ‘fishing years’ that do not correspond to calendar years will require reporting of some data in both calendar and fishing year.

INPUT DATA TABLES (Data report section)

Life History

- Mean weight & length
- Maturation schedule
- Fecundity
- Age-Length keys
- Growth models

Catch

- Total annual landings
- Landings by sector (i.e., comm and rec)
- Landings by gear/sector
- Landings by state/jurisdiction/sector
- Discards, discard losses, release mortality, by sector/gear
- Catch mean weights, by sector/gear
- Length distributions, by sector/gear/year, season
- Total catch time series as input to model

Sampling

- Length, age, weight sampling intensity
- Number of samples taken
- Number of trips sampled

Dependent Surveys and Effort

- Total effort
- Effort by gear/sector
- Effort by state/jurisdiction
- Survey CPUE time series as input to model

Independent Surveys

- Survey Effort
- Survey Coverage

Survey length/age distribution
 Survey CPUE, Catch
 Survey CPUE time series as input to model

ASSESSMENT RESULTS TABLES (Assessment Report)

Input specifications

Complete list of input specifications required for the model
 e.g., fitting methods, min/max limits, ages for averaging, assumptions
 List of all parameters estimated

Measures of precision and fit

Error components, contribution to total error
 Sums of squares, variances, CV's, and other statistical measures for est. values
 Error weighting values
 Residuals (plotted)
 Time series of observed and predicted values for fitting/tuning criteria (plotted)

Population Estimates

Total annual abundance
 Abundance at age
 Recruitment
 Biomass, annual and by age
 Spawner abundance and biomass, annual and by age
 Fecundity, total annual and by age

Exploitation

Fishing mortality, annual and by age
 Selectivity or partial recruitment

POPULATION MODELING

Yield per Recruit

Complete input values table
 Complete results table
 Figure of yield and ssb per recruit

Stock-Recruitment modeling

Table of input values
 S-R parameter estimates and precision measures
 residual plots

PROJECTIONS AND BENCHMARKS TABLES

Inputs

Catch or exploitation assumptions
 Starting population values
 Fishery characteristics – selectivity, limits, weights
 Stock-recruit model or assumption

Projection Results

Population abundance
 Recruitment
 Biomass
 Catch
 Exploitation

Benchmark Results

SFA criteria values, confidence intervals
Fmsy, MSST, MFMT, Bmsy, Generation time estimate

Appendix B. Review Panel Reports

The Review Panel is charged with producing two reports: 1) a Consensus Summary, in which their comments, criticisms, and suggestions are summarized and the Terms of Reference are addressed, and 2) an advisory report, in which they summarize stock status and their advice.

The Consensus Summary contains documentation of the Review Panels discussions and decisions regarding the stock assessment. The primary component is a review of each of the Terms of Reference.

1. Consensus Summary

Section 1. Workshop Information (SEDAR Coordinator)

Note the dates and location of the Workshop
List the Panel

Section 2. Terms of Reference (Panel Leader)

Address each item individually

Section 3. General Comments

Summarize additional comments or concerns, with a dedicated section for each constituent group on the review panel. These sections are encouraged but not mandatory. It is the responsibility of each group to draft comments and submit them to the Chair for inclusion in the final report. It is not necessary for the panel as a whole to review or agree with these comments.

A. Scientists

B. Constituents or fishers

C. Environmentalists

Section 4. SEDAR Review

Provide any desired comments on the overall process

2. Advisory Report

The Advisory Report is a brief summary of the assessment. Comments within each heading may range from a few lines to a few paragraphs. Three tables are typical, one which summarizes any forecasts of future stock conditions, a second which summarizes fishery and stock status for the last 10 years, and a third which summarizes stock status criteria and estimated values. A standard set of figures provides stock status at a glance.

Advisory Report Components:

State of Stock

Summary statements regarding status of the stock.

Stock Identification and Distribution

Summary of the unit stock and its geographic distribution.

Data and Assessment

Summary of input data and assessment method

Forecasts

Summary of forecasts method and results

(Forecasts Table)

The Forecasts table summarizes probable future stock status, including values of fishing mortality, stock abundance, and allowable catch levels if appropriate

(Catch and Status table)

The Catch and Status table summarizes the most recent 10 years of stock and fishery conditions, and also includes time series maximum, minimum, and mean for each criteria listed. Items listed in the table typically include: catch and discards by fishery sector, fishing mortality estimates, stock abundance and biomass, spawning stock biomass, recruitment, and stock status relative to benchmark values (e.g., F/F_{msy} , B/B_{msy}).

Catches

Summary of catches by fishery

Fishing Mortality

Summary of trends in fishing mortality

Recruitment

Statement of recruitment measure and summarized recruitment trends

Stock Biomass

Statement of biomass measures and summarized biomass trends

Stock Status Criteria

Summary of current references and recommended values

(Stock Status Criteria Table)

Summary of recommended or mandated benchmarks and estimated values.

Special Comments

Additional comments of importance

Sources of Information

Source of assessment information

FIGURES

1. *Landings*
2. *Exploitation*
3. *Stock Biomass*
4. *Indices*
5. *Stock-Recruitment*
6. *Control Rule*

Appendix C. SEDAR Document Series

The SEDAR process generates many documents, from simple descriptions of sampling projects to complete stock assessments. Organizing and keeping an administrative record of SEDAR documents requires a tracking system that can accommodate these many different document types. Following discussions with principal assessment scientists with the SEFSC in both Miami and Beaufort, a SEDAR document numbering system was devised. The SEDAR Document Series includes two types of documents: Working Papers and Assessment Reports. Starting with the fourth SEDAR, Atlantic and Caribbean Deepwater snapper grouper, documents prepared for SEDAR workshops follow the SEDAR document series numbering convention.

Working Papers: Working Papers are the backbone documents of the Data and Assessment workshops. Through these informal papers authors describe data collection programs; present preliminary analyses of assessment components such as surveys, CPUE indices, and age composition; summarize life history information, and develop general descriptions of fisheries and landings. Ideally, the working papers contain much of the text needed to draft various assessment report segments, and the authors can ‘cut and paste’ relevant sections. There is no strict format imposed for Working Papers; as long as the relevant information is provided authors are encouraged to follow a standardized journal format of their choosing. Although working papers are not peer reviewed, they do provide an authorship opportunity for those who do much of the work on the stock assessment, and ideas developed in the working papers and advanced during the Workshop discussions may ultimately lead to peer-reviewed articles. Documents in the Working Papers series become part of the SEDAR Administrative Record and are available upon request from the SEDAR staff. Authors shall submit electronic copies that are archived as .pdf files. Those not available electronically will be scanned to create .pdf files. The numbering convention includes a workshop designation, SEDAR series number, and a document number. For example, SEDAR4-DW-1 would designate working paper number 1 generated for the Data Workshop of the fourth SEDAR.

Assessment Reports: Assessment Reports are the final products of the SEDAR process. These are the documents approved by the Review Panel for submission to the Councils or Commissions. As they are the result of many people working through a series of workshops, no authorship is assigned. Assessment Reports are formatted according to the SEDAR Assessment Report Outline, as modified during the Workshops to meet the needs of the particular species or complex. Documents in the Assessment Reports series become part of the SEDAR Administrative Record and are available upon request from the SEDAR staff. Electronic copies are required so that the reports can be made available through the Internet. The numbering convention includes the SEDAR series number, the designation ‘AR’ to indicate the Assessment Report series, and a document number. For example, SEDAR4-AR-1 would indicate Assessment Report 1 from the fourth SEDAR.

Appendix D. SEDAR Workshop Participation Guidelines

Concerns over selection and appointment of participants to SEDAR workshop panels and confusion surrounding the appointment process compelled the SEDAR Steering Committee to adopt expanded guidelines for workshop participation. One problem in particular involved uncertainty as to who is responsible for workshop panel appointments, as illustrated by members of special interest groups interested in participating in SEDAR workshops, particularly as review panelists, contacting the SEDAR Coordinator and the Councils to volunteer their services and request appointment to workshop panels. Other issues included uncertainty around those eligible for appointment to workshop panels and the process the Councils should follow in making appointments. A final concern involved identifying the range of expertise and knowledge necessary for each workshop panel to complete its charge.

The following guidelines are intended to clarify who may participate and how participants are selected. The goal is to provide enough formal guidance to ensure consistency and compliance with federal regulations and Council procedures, while preserving enough flexibility to respond to unforeseen circumstances. These guidelines will also help clarify the responsibilities of SEDAR staff and the Councils in identifying participants. Adhering to process and procedures in selecting participants is perhaps most critical for the Review Workshop, since this body has the task of establishing whether or not the assessment is technically sound.

NOAA General Consul provided guidance on SEDAR participation when SEDAR was approved for all 3 Councils and NOAA Fisheries. This guidance stated that each Council would establish a SEDAR Advisory Panel (typically considered the SEDAR Pool) from which participants shall be selected for each workshop. All Workshop Panel participants appointed by a Council must be included in that Council's SEDAR Advisory Panel. The SEDAR Advisory Panel is governed by the same requirements as any other Council Panel. Employees of state and federal agencies, the Councils, and the Interstate Commissions must be appointed to the SEDAR Advisory Panel if they are to be appointed to a SEDAR Workshop Panel.

1. General Appointment Procedures

Participants for SEDAR workshop panels are appointed by the Councils from the membership of their SEDAR Advisory Panels. The Council requesting the assessment and having jurisdiction over the species assessed is responsible for appointing panelists. The SEFSC Director and SERO Administrator are responsible for submitting designees to the Council for appointment to workshop panels to provide expertise and represent their offices as appropriate.

In the event of joint jurisdiction, each Council with an interest makes appointments from within its SEDAR Advisory Panel. For a Review Workshop Panel where the number of panelists is loosely restrictive, when multiple Councils or Commissions have an interest in the species being assessed, the Councils and Commissions shall each agree to an equitable division of the available seats when the SEDAR cycle is approved by the Steering Committee.

Each Council is responsible for establishing guidelines and procedures for making appointments. It is not necessary for these guidelines and procedures to be identical for

each Council. Each Council is responsible for ensuring that the participants it appoints are eligible under Council Advisory Panel procedures.

Participants appointed to Workshop Panels are expected to participate in the entire workshop. The structure of the SEDAR workshops is such that many decisions are not made until near the end, after considerable deliberation and analyses. Further, reports are often not finalized until several weeks following the meeting. All participants should be informed that participation may involve considerable time and effort. It is especially critical that Review Workshop Panelists participate in all stages of the Workshop. The need to draft reports during the workshop and bring those drafts to the Panel for review throughout the workshop dictates that Review Panel seats cannot 'revolve' among several individuals as particular species are addressed. Those having specific knowledge or interest of a single species or issue better serve the process through participation in Data and Assessment Workshops, whereas those with broader knowledge and strong analytical expertise are most appropriate as Review Workshop Panelists.

2. Suggested Participants

The following sections describe in general terms the expertise that is typically required for each workshop panel. The classifications are neither obligatory nor restrictive. Each Council is responsible for making those appointments it deems necessary for the task at hand.

2.1 Data Workshop

The Data Workshop Panel is charged with reviewing the full spectrum of input data, including fisheries statistics, monitoring programs, life history, and management history. This requires individuals from many disciplines possessing a broad range of skills and expertise. It is also the point in the SEDAR process where the anecdotal knowledge and first person observations of experienced fishermen and constituents are the most useful.

Suggested Participants:

- SEFSC Assessment Scientists
- Other NMFS Assessment Scientists
- Council SSC representatives
- Council Assessment Panel representatives
- Council Socio-economic Panel representatives
- Council Advisory Panel representatives
- SERO representatives
- Council/Commission Technical staff
- State Agency researchers, biologists, data collectors, analysts
- University assessment analysts
- Life history researchers, from NMFS, State Agencies, or Universities
- Marfin research grant recipients
- NMFS General Canvass representatives
- MRFSS representatives
- State data collection representatives (e.g., trip ticket program, FIN)

- Logbook Program representatives
- SE Headboat Survey representatives
- Cooperative Monitoring Program representatives (e.g., MARMAP, SEAMAP)
- NGO representatives
- Independent or contracted consultants
- Fishery or constituent representatives

2.2 Assessment Workshops.

Assessment Workshop panels must complete the assessment model and prepare the results. This requires a high level of technical expertise, and Assessment Workshop Panels should be composed primarily of assessment scientists.

Suggested Participants

- SEFSC Assessment Scientists
- Other NMFS Assessment Scientists
- Council SSC representatives
- Council Assessment Panel representatives
- Council Socio-economic Panel representatives
- Council Advisory Panel representatives
- SERO representatives
- Council/Commission Technical staff
- State Agency researchers, biologists, data collectors, analysts
- University assessment analysts
- NGO representatives or designees
- Independent or constituent group contracted consultants
- Fishery or constituent representatives from outside the AP's

2.3. Review Workshops.

Review Workshop panelists must provide an independent technical review of the stock assessment and the input data. It is critical that the core Review Workshop Panel participants are experienced in reviewing and conducting fisheries population assessments. CIE reviewers involved in the first several SEDAR Review Panels warned that diluting the technical expertise of the review panel would reduce the robustness and quality of the review and ultimately the confidence in the final stock assessment product.

CIE reviewers also suggested that 6 reviewers are too few, in that if any one person is out of the room then the group is significantly reduced and allowing that one of the reviewers is serving as chair results in only 5 unhindered reviewers. Conversely, CIE reviewers and representatives from the NEFSC SAW/SARC process advise that too large a panel, perhaps more than 12, becomes difficult to manage and keep focused on specific tasks. The SEDAR Steering Committee endorsed a loose restriction of 12 participants for a Review Workshop Panel.

The Steering Committee upholds strict independence for the Review Workshop Panel. Those who participate as panelists in Data or Assessment Workshops for a particular SEDAR cycle, or who had direct involvement developing an assessment submitted for review, are not eligible to serve as Review Workshop Panelists. Council and Regional Office staff are not eligible to serve as Review Panelists.

Suggested Participants

- CIE representative, Chair
- CIE representative, reviewer
- SEFSC assessment scientist
- NOAA Fisheries assessment scientist, outside the SEFSC
- Council Assessment Panel representatives
- Council SSC representatives
- State or University assessment analysts
- 2 Council constituent representatives (e.g., AP members)
- NGO representative

Appendix E. Review of SEDAR Workload and Scheduling

I. Number of SEDAR Cycles per year

1. Issue: How many SEDAR assessment Cycles can be completed during a year?

2. Background

The SEDAR assessment process was developed to improve the quality of stock assessments and to increase and expand participation in the assessment process to provide managers and constituent's greater confidence in assessment results. Primary changes from the past assessment development process include the addition of a Data Workshop and a Review Workshop which involve many participants. Additional workshops and broader participation increase time demands on federal and state agencies as well as constituent representatives. The trade-off is an improved product, or as stated succinctly by some who conceived the SEDAR concept, 'SEDAR produces better assessments, not necessarily faster assessments'.

The first several SEDAR cycles spread the three workshops over a 4-6 month period and cycles did not overlap. This allowed ample time between the workshops to prepare reports and complete any supplemental analyses, and ensured strong participation because those involved were provided time between workshops to address other responsibilities.

The SEDAR schedule for 2003-2004 includes 3 complete cycles – Deepwater Snapper-Grouper, King Mackerel, and Red Snapper – and an additional Review Workshop – Goliath Grouper and Hogfish. Scheduling 10 SEDAR Workshops within a year has created difficulties for participants, such as workshops scheduled during scheduled Federal holidays and important dates (Election Day, Washington's Birthday, Memorial Day), Workshops scheduled only 2 weeks apart, and travel on busy dates (the Sunday-Monday after Thanksgiving). Overall travel also becomes demanding, with 17 Council or Commission Meetings and SEDAR Workshops scheduled in a 26-week period between November 2003 and April 2004, a period that also includes 2 major holidays.

The SEDAR cycles in 2003/2004 also run concurrently, resulting in those responsible for preparing analyses and reports being pulled in several directions at once. For example, the Deepwater Data Workshop was November 3-7 and the Mackerel Data Workshop was December 1-5. A number of key participants were involved in both Workshops, and they felt that there was inadequate time to both finalize the report from the first workshop and prepare analyses for the second. Participation also suffered at Mackerel, especially from the States, as during this time of year many agency biologists are committed to preparing a variety of year-end reports. Many who were asked to participate indicated that they would like to, but just could not commit the time to both and were therefore forced to choose one workshop over the other. Such time demands are just as important, if not more so, to the constituent representatives, especially when Council and Advisory Panel meetings are taken into account. While constituent representatives may not feel the burden of preparing materials for the meeting, most do devote time to preparation. They are also quick to point out that time spent at meetings is

time not spent working their paying jobs, creating a potentially significant economic burden from numerous and closely scheduled meetings.

SEDAR 4, Deepwater Snapper-Grouper, was assigned 12 species over two areas. This task was daunting, given that past SEDAR's were challenged in dealing with 2-3 species in a single, weeklong Data Workshop. However, the Workshop went quite well, and an enormous quantity of data was reviewed and compiled. The key to accomplishing the task was adequate preparation. Agency scientists with the states and SEFSC began data compilations and preliminary analyses approximately 8 weeks before the Workshop, producing 30 new working papers and reviewing nearly as many relevant journal articles and agency documents. Key assessment scientists, data managers, and life history researchers throughout the SEFSC and state agencies devoted several weeks to this project alone. A significant ongoing research recommendation was also pursued, with efforts devoted to developing an abundance index from the Southeast Logbook Program. Also noteworthy is that this was the first time complete data compilations and reviews were attempted for many of the species involved. Much of the work was new, with little past guidance available as to the relevant programs and data sources, thus much of the data was taken from original 'raw' data files necessitating time consuming error checking and verification exercises. The 'take home lesson' from the Workshop was that an enormous amount of data can be reviewed, and a large number of species addressed, if ample preparation time is provided. Conversely, if the participants had been faced with other workshops during the 6-8 weeks they devoted to preparation for the Deepwater Workshop, it is likely that only the most common species would have been addressed.

Fixed scheduling will improve personal workload scheduling. Several key participants have expressed an interest in knowing 12-18 months in advance, if not longer, of the approximate scheduling of SEDAR cycles. Suggestions have been made that SEDAR cycles be scheduled consistently from year to year. This would enable participants to arrange their work plans to allow ample time for workshop preparation, as even if they did not know the particular species that may be assessed, they would know the approximate schedule of SEDAR obligations.

Fixed scheduling will also benefit Council workload planning. For instance, if it is accepted that assessments will be completed in March and September, then the Councils can plan SSC meetings accordingly. FMP approvals or other actions contingent upon an upcoming assessment can also be better planned if assessments are provided at consistent times. The assessment review in the Northeast Region, the SAW/SARC has followed a consistent schedule with two cycles for many years. This allows the New England and Mid-Atlantic Councils and the ASMFC to know when assessment advice will become available, and they are able to schedule their meetings and actions to synchronize with, rather than conflict with, the assessment schedule.

3. Proposed SEDAR schedule

Following discussions with assessment scientists in the SE Region and considering the assessment review procedures in other regions, it was determined that SEDAR should include 2 assessment cycles per year. The first cycle would run from April – September and be based through the Miami Lab. The second cycle would run from October through March and be based through the Beaufort Lab. The Data Workshop for one cycle will be scheduled approximately 8 weeks following the Review

workshop of the previous cycle. The Assessment Workshop will be scheduled approximately 8 weeks following the Data Workshop. The Review Workshop will be scheduled approximately 6 weeks following the Assessment Workshop. Actual starting and ending times can be adjusted to best meet ongoing lab responsibilities, such as ICCAT. This will add 6 SEDAR workshop meeting weeks to the Calendar, and will enable production of 2 – 4 complete benchmark assessments under the current model.

Summary:

- 2 SEDAR Cycles per year
 1. Miami, April – September
 2. Beaufort, October – March
- Dates may be adjusted after review by Population Dynamics team leaders from each lab.

The concept of 2 annual cycles was endorsed by the Steering Committee in January 2004. The timing of these cycles will be determined by the Steering Committee when it establishes assessment priorities. The particular labs assigned to a cycle will be determined by the SEFSC Director.

II. Assessments per Cycle

1. Issue: How many assessments can be completed in a SEDAR cycle?

2. Background

Scheduling SEDAR assessments requires a compromise between the management need for up-to-date quantitative advice on many species and the limited time and personnel available to prepare assessments. Past SEDAR's have been assigned anywhere from one to 12 species, with one or two complete assessments ultimately prepared during a single Assessment Workshop. Participants and assessment scientists advise that no more than 2 new and complete catch-based benchmark assessments can be prepared during a single Assessment Workshop. At first glance one may be tempted to assume that more species can be assessed during a workshop if the assessments are based on less data-intensive approaches such as production models or relative analyses of survey information. However, the uncertainties inherent in data-poor species often increase rather than decrease preparation time.

Assessment Workshops are the crucial element in determining the number of species to assess. Experience shows that Data Workshops can adequately address 1 – 2 data rich species (e.g., catch, biological sampling, and survey data all available) and even more of data poor species (e.g., some key data sources completely lacking and others incomplete). Review Workshops to date have been driven by the Assessment Workshop products, but they could conceivably address as many as 4 species in a single week. For example, the Stock Assessment Review Committee (SARC) of the Northeast Region typically reviews 3 -6 assessments per weeklong meeting. One criticism sometimes directed at the SARC, however, is that not enough time is allotted to really provide an in-depth review of all assessment aspects, and as a result only 'pet' topics are raised or

glaring errors resolved. Obviously, the more species assigned a Review Workshop, the less time available to devote to any one species.

Forcing Assessment Workshops to function at the maximum productivity level will require attention to the overall workload and potential schedule conflicts. The number of species assessed during an Assessment Workshop and the data requirements of the assessment methods used dictate the amount of advance preparation that is necessary. During the first two SEDAR's, the preferred approach was to complete the majority of the work during the actual workshop. In other words, nearly all model runs were conceived and prepared during a single week. While this worked fine when a single species was involved, this approach proved inadequate when two species were assessed. Problems included inadequate review of model code that lead to overlooked errors, baseline model configurations not completed until the final day, inadequate review of input data files leading to transcription and conversion errors, and no time for participants as a group to review and interpret model results. Assessing multiple species in a single workshop will require that potential baseline model configurations be prepared prior to the actual workshop.

3. Proposal

SEDAR Cycles should be limited to completing 1 or 2 complete, catch-structured, benchmark assessments.

Assessments that are expected to be unusually complex or potentially controversial should be handled individually. An example is the upcoming red snapper assessment.

For species with several unit stocks requiring separate assessments, each unit stock should be considered an individual assessment when establishing the workload. An example is king mackerel, for which the Gulf and Atlantic stocks are each assessed separately.

Limiting SEDAR cycles to 1 or 2 complete benchmark assessments was endorsed by the Steering Committee in January 2004.

III. Mixing of Jurisdictions or Separate Stocks of a Species

1. Issue: Is any efficiency gained by combining species that may occur in several areas?

2. Background

The fourth SEDAR cycle was charged with assessing the deepwater snapper grouper complex of the Atlantic and Caribbean. Theoretically there could be some workload savings from assessing similar species together. In practice, this was not really the case. The Data workshop for SEDAR 4 essentially functioned as two workshops running concurrently at the same location, with one group largely dedicated to the Atlantic species and a separate group dedicated to the Caribbean species. Although all species were considered 'deepwater', there were few other similarities. Data collection methods, fisheries, and personnel were completely different for the two jurisdictions. Even if there had been some common species, their biological traits could vary between

areas and their fisheries would vary between areas. Moreover, most participants were experienced with the species and fisheries in a single area, and had little to offer in terms of helping those working in the other area solve their data issues. While some participants acknowledged it was informative to learn of the various data issues in another area, none really felt that combining the jurisdictions made the process any more efficient. Some in fact felt that efficiency suffered.

This is not to imply that jurisdictions should never be mixed. In the case of king mackerel, the fisheries and the migratory units overlap, thus assessing one component without considering the other would be difficult. The determining factor in combining species across jurisdictions should be the management unit, not the species name or assigned complex. For example, it may be more appropriate to combine an assessment of South Atlantic black sea bass with mid-Atlantic black sea bass, rather than a Gulf of Mexico or Caribbean species inhabiting a similar depth zone, since there is a possibility that fish in the two unit stocks do not always acknowledge the management boundary at Cape Hatteras.

3. Proposal

Most workshop participants did not feel efficiency was improved by combining a complex across jurisdictions.

Species should not be combined within a SEDAR based solely on name or complex designation.

Combining complexes of multiple species or management units of single species across management jurisdictions should be considered when there is the possibility of exchange and overlap based on migratory routes or fisheries.

The scheduled assessment of the Gulf of Mexico and South Atlantic shallow water complex should be treated as separate SEDAR cycles if there is not significant jurisdictional overlap of species' management units or fisheries.

Limiting SEDAR cycles to a single jurisdiction (Council), except when Councils have joint FMP's or in some other way share jurisdiction over a unit stock was endorsed by the Steering Committee in January 2003.

IV. Increasing Assessment Productivity.

1. Issue: If SEDAR is limited to 2 cycles per year, and 1-2 species are assessed per SEDAR, then Councils can only expect to receive 2-4 complete, baseline assessments per year. How can productivity increase to meet management needs?

2. Background

Balancing management data needs and limited analytical resources was an issue long before SEDAR, and is certainly not limited to the Southeast Region or Council

management. However, since SEDAR is a new process, it may be easier to develop procedures that both allow for thorough independent reviews of baseline assessments and increase assessment products without being hampered by the institutional inertia of a long-standing program.

The SAW/SARC process in the Northeast Region produces around 8 assessment per year. This is about twice what can be expected from SEDAR, which can be attributed to several key factors. First, the population dynamics staff of the NEFSC is larger than that of the SEFSC, and there is considerably more state expertise available as well. Second, the SAW/SARC does not include a component similar to the SEDAR Data Workshop. The SEDAR Data Workshop is considered a significant advance in assessment procedures, and in fact the SAW/SARC is considering adding a similar component. The OMB also inquired about SEDAR in general and the Data Workshop in particular, as part of a Congressionally mandated review of the STAR assessment review process used in the Pacific Northwest. Third, the SAW/SARC does not include constituents in all phases of assessment development, which is another SEDAR innovation that attracted the attention of OMB reviewers. Fourth, assessments reviewed in the SAW/SARC are largely produced by only 1 or 2 scientists, rather than an Assessment Workshop panel as in SEDAR. Each assessment is developed under a working group, composed of state and federal scientists, which completes tasks similar to those from the Data and Assessment Workshops, but the actual model work and report generation falls to 1 or 2 lead scientists. It should also be noted that each assessment requires a meeting of a working group, so there is still a significant time demand.

The NEFSC is responsible for assessing about 40 species, so completing 8 per year should allow each species to run through the review process once every 5 years. However, just as in the Southeast, there is a management demand for more assessment information than can be reasonably provided within a year. At one time the SAW/SARC tried running 3 cycles in a year, but scheduling difficulties and workload strains led to a return to 2 cycles. Management needs are supposed to be better addressed by allowing ‘turn of the crank’ assessments or annual updates to be prepared and used without a full SAW/SARC review. Annual ‘turn of the crank’ assessments are considered those where only the input data are updated, and the model is run with the recent information and the assessment configuration developed during the last review. No new data sources are included and no specification changes are supposed to occur in ‘turn of the crank’ assessments. For example, consider a species managed by an annual quota. An approved assessment configuration can be updated by the science center annually to provide quota values. Results are reviewed by either an SSC or, in the case of the Mid-Atlantic Council, a ‘Technical Monitoring Committee’ which is charged with recommending the annual quota or TAC. Every 5 years the assessment would be reviewed by the SAW/SARC. In practice, many planned ‘turn of the crank’ assessments are reviewed by the SAW/SARC, sometimes as often as annually for particularly controversial species. This is especially common when the updated assessment results suggest unexpected quota reductions or considerable changes in stock parameters. Thus, while a hierarchy of assessments may increase output, it is not always a panacea for limited assessment production capabilities.

The ASMFC manages a number of species that require annual specifications and assessment information. ASMFC assessments are produced by Committees largely composed of state scientists, a pool of expertise that is stretched even thinner than the

science center staffs. ASMFC procedures typically require that stock assessments receive an outside peer review every 5 years, through SAW/SARC, SEDAR, or the Commission's Peer Review Process. Assessments for species that require updates, such as striped bass, are prepared by Assessment Committees and reviewed by Technical Committees. The annual updates are most often 'turn of the crank' assessments, but as with all things in fisheries management it is not always the case. At least in the case of striped bass, a hierarchy of assessment reviews provides a reasonable compromise between limited assessment resources and management requirements.

Even if the assessment staff is increased in the SEFSC, the number of assessments that can be reviewed will still be limited. The cornerstone of SEDAR is participation that extends well beyond the science center and even state agencies. Increased involvement of constituents, environmentalists, and biologists and researchers from many specialties along with the multiple workshop approach is generating interest well beyond the Southeast and should be maintained. Attempting to squeeze more cycles and meetings into a year will place a considerable burden on constituent representatives and outside, independent reviewers. It will also burden the various Council committees and Pools that are mandatory participants. Therefore, a compromise should be found that preserves SEDAR as conceived while allowing flexibility to increase assessment products.

3. Proposal

Establish a hierarchical review process

One possible solution is to adopt a hierarchical review process, including a regular schedule of SEDAR reviews for primary species managed by the three Councils and a process for providing up-to-date assessment products in those years between SEDAR reviews.

The first step would be establishing the SEDAR review schedule. It is popular to recommend that a species be reviewed every 5 years, but the varied life histories of the species, the large number of species managed, and the management strategies for the fisheries in the region may prevent such a simplistic approach. Relative stock status should also be a consideration, as a minor species with a 30 year rebuilding schedule may do fine if only reviewed every 10 years, while a major species with a 5 year rebuilding schedule may require a complete review every 2 or 3 years. Council SSC's or assessment panels could be used to develop initial recommendations

The second step would be establishing a process for reviewing updated assessments between SEDAR reviews. Such updates could be restricted to 'turn of the crank' assessments in which the only change is that additional years of data are added. Councils could also decide to limit the type of information coming from interim reviews, such as restricting them to simply updating stock status or ABC levels and not reconsidering or changing reference point values. Reviewing these interim assessments could be handled by the SSC's, or in some cases by a regularly scheduled SEDAR Review Panel. A combination approach could also be used, allowing for a SEDAR review panel to consider an interim assessment update in the event an SSC cannot reach consensus.

The concept of establishing a hierarchical review process was endorsed by the Steering Committee in January 2004. Specific details will be considered at a later date.

**Appendix F. SEDAR Planning Schedule
As of March 2004**

SEDAR History, Current Work Plan, and Future Priorities

August 27, 2004

1. SEDAR Benchmark Assessment List

SEDAR #	SPECIES	Year	Status July 2004
1	SAFMC Red Porgy	2002	FINAL
2	SAFMC Vermillion Snapper/Black Seabass	2003	FINAL
3	SAFMC Yellowtail Snapper ASMFC Atlantic Menhaden / Croaker	2003	FINAL
4	SAFMC Tilefish, Snowy Grouper	2003/04	FINAL
5	SAFMC & GMFMC King Mackerel	2004	FINAL
6	FL (SAFMC/GMFMC) Goliath Grouper & Hogfish	2004	FINAL
7	GMFMC Red Snapper	2004	ONGOING
8	CFMC Yellowtail Snapper CFMC Spiny Lobster FL (SAFMC/GMFMC) Spiny Lobster	2004/05	PLANNING
9	GMFMC Vermillion/Greater Amberjack	2005	PLANNING
10	SAFMC & GMFMC Gag Grouper	2006	PENDING
11	SAFMC & GMFMC Gray Triggerfish	2006	PENDING
12	SAFMC & GMFMC Red Grouper	2007	SCHEDULED
13	CFMC Yellowfin Gouper, Mutton & Lane Snapper	2007	SCHEDULED
14	SAFMC & GMFMC King Mackerel	2008	TENTATIVE

2. SEDAR Assessment Update Schedule

Species	Benchmark SEDAR#	Scheduled for Update	Status
SA Red Porgy	1	2005	PENDING
SA Vermillion Snapper	2	2006	PENDING
SA Black Seabass	2	2006	PENDING

3. Future Benchmark Priorities

GMFMC	SAFMC	CFMC
Black Grouper	Red Snapper	
	White Grunt	
	Black Grouper	
	King Mackerel	

SEDAR Benchmark Assessment Schedule Priorities and Justification – 2005 - 2007.

SEDAR #	Expected Completion	Resource	Councils	Comments
SEDAR-8	May 2005	Spiny Lobster and Yellowtail Snapper	CFMC	Yellowtail data considered in SEDAR 3 but not assessed. Spiny lobster an important, primary species for which an assessment should be feasible.
		Spiny Lobster	FMRI has primary responsibility; GMFMC and SAFMC	FMRI has primary responsibility with state, councils, and NMFS jointly participating in the SEDAR review workshop.
SEDAR-9	Dec . 2005	Vermilion Snapper, Greater Amberjack (with Review of Red Drum Escapement Estimates)	GMFMC	Both stocks are under rebuilding plans and full assessments are due
SEDAR-10	May 2006	Gag	GMFMC and SAFMC	Last GMFMC assessment was in 2001; therefore, a full assessment is needed to update the status of the stock
SEDAR-11	Nov . 2006	Gray Triggerfish	GMFMC and SAFMC	Last GMFMC assessment was inconclusive. The Reef Fish Stock Assessment Panel decided not to specify the status determination criteria or a recommendation of the stock status. GMFMC would like to review the landing and CPUE data in 2005 at its July meeting to ascertain whether changes are occurring and whether landings have remained below the one million pound level as suggested by the Reef Fish Stock Assessment Panel.
SEDAR-12	May 2007	Red Grouper	GMFMC and SAFMC	Currently, the Gulf stock is under a program to arrest overfishing and the assessment needs to assess the effectiveness of that program.
SEDAR-13	Nov. 2007	Yellowfin Grouper, Mutton Snapper, Lane Snapper	CFMC	Data believed adequate to conduct assessment
		Black Grouper	GMFMC	GMFMC has requested that FMRI develop assessments for black grouper and scamp some time in the future.
		King Mackerel	SAFMC	SAFMC SSC rejected the assessment from SEDAR 5.

4. SEDAR WEEKLY PLANNING SCHEDULE

WEEK	Meeting / (Dates)	Description	Location
2004	2004	2004	2004
Jan 5-9			
Jan 12-16	<i>GMFMC</i>		<i>Austin, TX</i>
Jan 19-23	Jan 19 Holiday		
Jan 26-30	Review Workshop (2/27-2/30)	SEDAR 6 Goliath Grouper & Hogfish	Tampa-Airport Hilton
Feb 2-6			
Feb 9-13			
Feb 16-20	Assessment Workshop (2/16-2/20) Feb 16 Holiday	SEDAR 5 Atlantic & Gulf King Mackerel	Miami, FL - SEFSC
Feb 23-27			
<i>March 1-5</i>	<i>SAFMC</i>		<i>St Simon GA</i>
<i>March 8-11</i>	<i>GMFMC ASMFC</i>		<i>Mobile AL Alexandria VA</i>
March 15-19			
<i>March 22-26</i>	<i>CFMC</i>		
Mar 29- Apr 2			
Apr 5-9	Review Workshop (4/5-4/8)	SEDAR 5 Atlantic & Gulf King Mackerel	Miami, FL - SEFSC
Apr 12-16			
April 19-23	Data Workshop (4/19-4/23)	SEDAR 7 Gulf Red Snapper	New Orleans, LA International House Hotel
Apr 26-30			
May 3-7			
<i>May 10-13</i>			
May 17-21	<i>GMFMC</i>		<i>Key Largo FL</i>
May 24-28	<i>ASMFC SEFSC Headboat Review</i>		<i>Alexandria VA Beaufort NC</i>
May 31-June 4	May 31 Holiday		
June 7-11	Assessment Workshop (6/7-6/11)	SEDAR 4 Atlantic Deepwater S-G Tilefish, Snowy Grouper	Beaufort, NC NOAA Laboratory
<i>June 14-18</i>	<i>SAFMC</i>		<i>Key West FL</i>
June 21-25			
June 28-July 2			
July 5-9	July 5 Holiday		
<i>July 12-15</i>	<i>GMFMC</i>		<i>Houston TX</i>
July 19-23			
July 26-30	Review Workshop (7/26-7/30)	SEDAR 4 Atlantic Deepwater S-G Tilefish, Snowy Grouper	Charlotte NC Holiday Inn Center City
<i>Aug 2-6</i>	<i>CFMC</i>		
Aug 9-13			
August 16-20	Assess Workshop (8/16-8/20) ASMFC	SEDAR 7 Gulf Red Snapper	Miami, FL SEFSC Alexandria VA
<i>Aug 21-27</i>	<i>AFS Annual Meeting</i>		<i>Madison WI</i>
Aug 30-Sept 3			
<i>Sept 6-10</i>	Sept 6 Holiday		

Sept 13-17	<i>GMFMC Ecosystem Mgmt Workshop</i>		<i>Panama City FL Key Largo FL</i>
Sept 20-24	<i>SAFMC (w/SSC) ASMFC TCs</i>		<i>Pawleys Is SC NE</i>
Sept 27-Oct 1			
Oct 4-8	SCRS Coastfish2000		
Oct 11-15	Oct 11 Holiday		
Oct 18-22			
October 25-29	Review Workshop (10/25-10/28)	SEDAR 7 Gulf Red Snapper	New Orleans LA Holiday Inn Chateau LeMoyne
Nov 1-5			
Nov 8-12	<i>GMFMC GCFI Nov 11 Holiday</i>		<i>So Padre Is TX St. Petersburg FL</i>
Nov 15-19	ICCAT Commission		<i>New Orleans LA</i>
Nov 22-26	HOLIDAY		
Nov 29-Dec 3	SEDAR 7 AW2 ?		
Dec 6-10	<i>SAFMC SEDAR 8 DW</i>		<i>Atlantic Beach NC St Thomas</i>
Dec 13-17	SEDAR 7 AW 2 ?		
Dec 20-24	HOLIDAY		
Dec 27-31	HOLIDAY		
2005	2005	2005	2005
Jan 3-7			
Jan 10-14	<i>GMFMC</i>		<i>Baton Rouge LA</i>
Jan 17-21	Jan 17 Martin Luther King Day		
Jan 24-28			
Jan 31-Feb 4			
Feb 7-11	<i>ASMFC</i>		
Feb 14-18			
Feb 21-25	Feb 21 Presidents Day		
Feb 28-mar 4	SAFMC		GA
Mar 7-11	<i>GMFMC</i>		<i>Birmingham AL</i>
Mar 14-18	SEDAR8 AW TENTATIVE		St Croix
Mar 21-25	Manag. our Nations Fish. II		Washington DC
Mar 28-Apr 1	March 27 Easter		
Apr 4-8			
Apr 11-15			
Apr 18-22			
Apr 25-29			
May 2-6			
May 9-12	<i>ASMFC</i>		
May 16-20	SEDAR 8 RW Tentative		TBD
May 23-27			
May 30 – Jun 3	May 30 Memorial Day		
Jun 6-10			
Jun 13-17	SAFMC		FL
Jun 20-24			
Jun 27-Jul 1			

Jul 4 - 8	July 4 Independence Day		
Jul 11-15	SEDAR 9 DW TENT		TBD
Jul 18-22			
Jul 25-29			
Aug 1 – 5			
Aug 8 – 12	<i>ASMFC</i>		
Aug 15 – 19			
Aug 22 – 26			
Aug 29-Sep 2			
Sep 5-9	Sept 5 Labor Day		
Sep 12-16	AFS 135th Annual Meeting		
Sep 19-23	SAFMC		SC
Sep 26-30	SEDAR 9 AW TENTATIVE		MIAMI SEFSC
Oct 3-7			
Oct 10-14	Oct 10 Columbus Day		
Oct 17-21			
Oct 24-28			
Oct 31-Nov 4			
Nov 7-11	Nov 11 Veterans Day		
Nov 14-18			
Nov 21-25	HOLIDAY		
Nov 28-Dec 2			
Dec 5-9	SAFMC		NC
Dec 12-16	SEDAR 9 RW TENTATIVE		TBD
Dec 19-23	HOLIDAY		
Dec 26-30	HOLIDAY		
2006	2006	2006	2006
Jan 2-6			
Jan 9-13			
Jan 16 - 21			
Jan 23 - 27			
Jan 30 – Feb 3			