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# SEDAR

## SouthEast Data, Assessment, and Review

South Atlantic Fishery Management Council  
Gulf of Mexico Fishery Management Council  
Caribbean Fishery Management Council  
NOAA Fisheries  
Atlantic States Marine Fisheries Commission  
Gulf States Marine Fisheries Commission

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To: SEDAR Steering Committee  
From: Summary Report Workgroup  
Dale Theiling, Workgroup Coordinator  
Subject: An improved Summary Report for SEDAR stock assessments  
Date: May 18, 2009

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The SEDAR Summary Report Workgroup (workgroup) was assembled by the SEDAR Steering Committee to improve the summary report component of SEDAR stock assessment reports (SAR). The workgroup consists of representatives from these SEDAR partners.

Andy Strelcheck	SERO, NMFS
Bob Beal	ASMFC
Dale Theiling	SEDAR
Graciela Garcia-Moliner	CFMC
Jack McGovern	SERO, NMFS
John Carmichael	SAFMC
Karyl Brewster-Geisz	HMS, NMFS
Rick Leard	GMFMC
Tomas Jamir	SEFSC, NMFS

The workgroup reviewed past efforts related to stock assessment summary reports and discussed by conference calls and email the development of an outline and format guide for improved SEDAR assessment summaries. The group attempted to define an effective Assessment Summary Report (ASR) that provides for content that addresses the needs of SEDAR cooperators but still is reasonably within capabilities of the SEDAR analysts, coordinators, and other workshop participants who contribute to stock assessment reports.

Workgroup members were asked to consider the purposes served by a summary report for their office or agency, the concerns they were aware of pertaining to the current summary report content or process, and their ideas toward improvement. They drew on their experience with summary reports and their understanding of requirements of the Sustainable Fisheries Act and new Annual Catch Limits guidelines.

Guiding questions included:

- What specific issues does my agency or Steering Committee member have over the present process or content?
- What other specific issues over the present process or content am I aware of?
- Should any information in the summary report outline of the current guidelines be added, moved, or removed?
- Are there components of other stock assessment reports or earlier SEDAR advisory or summary reports that should be incorporated into the SEDAR summary report?
- Who should have writing and compilation responsibilities for preliminary and final components of the summary report?
- What level of specific directions should a format guide include for ASR preparation?

The findings of the workgroup are prepared in the form of two proposed amendments to current SEDAR Guidelines (version 17). The first amendment would replace the current summary report outline in an appendix with an ASR outline proposed by the workgroup. The second amendment would add an appendix providing guidance to prepare a SEDAR ASR.

Some significant points represented in the guideline amendments are:

- The ASR should be extractable from the parent SAR and serve as a stand-alone document.
- The SAR is developed for consumption by more technical users, specifically science and statistical committees, technical committees, other scientific interests, and future assessment teams. The ASR is designed and compiled primarily with policy makers, resource managers, and the interested non-technical reader in mind.
- The ASR purpose is to bring together concisely those specific results presented in a parent stock assessment report that are crucial to fishery management and regulation and supportive of general public understanding.
- All ASRs will be in a standard, logical format with consistent content which reflects the findings of the three-workshop SEDAR process.
- The ASR outline and specific contents may be customized with written justification for each SEDAR, in accord with the specific management criteria of the controlling fishery management plan or amendment via approved Terms of Reference (ToR) to ensure that partners receive content that suits their needs.
- The SEDAR coordinator will have ASR compilation responsibility. All ASR material will be derived from workshop reports or addenda. Responsibility to assure required and preferred content are available is shared by data workgroup leaders, analysts, and review chair.

- Preferably an ASR will contain no more than four pages of text, plus tables and figures.
- Titles of paragraphs and preferred content of tables and figures are specified in the outline.
- The topical paragraph **Stock Status and Determination Criteria** will appear first and contain a table displaying all stock status findings of the assessment.
- The ASR preparation guidance amendment describes preferred content of each topical paragraph and provides examples of tables and figures of preferred content.
- In topical paragraphs increased emphasis will be given to:
  - tracking significant changes made during the three-workshop SEDAR process,
  - stock life history characteristics, and
  - quantification of live and dead discards, release mortality, and scientific uncertainty.
- The paragraph on Allowable Biological Catch is removed.
- Review panels will no longer have responsibility to contribute to or improve the preliminary ASR. The requirement led to confusion at the review level, as reviewers were asked to provide non-binding comments on a document that may change following the review. It presented difficulties when summary reports required revision after the RW because there was no mechanism for reviewing the revised report.
- At the discretion of the RW chair, the preliminary ASR may be issued to the review panel as information.
- A recap of the development of an ASR developed for a SAR prepared under SEDAR is given.

# SEDAR

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### **Proposed Actions to Amend the SEDAR Guidelines**

#### **Summary**

#### **Action I (page 2)**

Amend SEDAR Guidelines **Appendix 8.2 SEDAR Assessment Report Outline** to update the Stock Assessment Report (SAR) format by incorporation of a newly approved format of the Assessment Summary Report, specifically SAR Section I, Chapter 5, prepared for fishery stock assessments performed through the SEDAR process.

#### **Action II (page 5)**

Amend the SEDAR Guidelines, Version 17, by addition of an Appendix to provide guidance for preparation of assessment summary reports for stock assessments performed through the SEDAR process.

## Action I

Amend SEDAR Guidelines **Appendix 8.2 SEDAR Assessment Report Outline** by striking Section I and inserting the following.

**The effect of the amendment is to update the Stock Assessment Report (SAR) format by incorporation of a newly approved format of the Assessment Summary Report, specifically SAR Section I, Chapter 5, prepared for fishery stock assessments performed through the SEDAR process.**

### Section I. Introduction [Contributor]

Cover Page [SEDAR]

Table of Contents [SEDAR]

#### 1. SEDAR Process Description [SEDAR]

#### 2. Management Overview [Lead SEDAR Partner]

(Incorporate tables and figures into items.)

2.1 Management Unit Definition

2.2 Regulatory History

2.3 Current Management Criteria and Stock Benchmarks

#### 3. Assessment History and Review [SEFSC]

#### 4. Regional Maps [SEDAR]

#### 5. Assessment Summary Report (ASR) [Compiled by SEDAR from workshop reports; to be completed following the Review Workshop]

(In each topical paragraph specify the workshop report component or addendum from which results are reported.)

Stock Status and Determination Criteria - declaration of stock status, based on current criteria and panel recommended criteria; SFA and management criteria recommendations and values; tables presenting stock status determinations and stock status criteria summary with recommended or mandated benchmarks and values summarized.

Stock Identification and Management Unit – the stock under assessment and its FMP-defined unit

Species Distribution – geographic distribution of the species under assessment

Stock Life History - summary of life history characteristics of the stock under assessment; includes a table summarizing length, weight, natural mortality, maturity, sex ratios, *et c.* by age.

Assessment Methods - summary of the assessment methods considered specifying the model employed for the base run

Assessment Data - summary of input data sources as used in the assessment model base run or sensitivities

Release Mortality – a quantitative description of the portion of fish released that do not survive, by fishery sector with size distinction where available

Catch Trends -summary of catches by fishery sector over time noting trends

Fishing Mortality Trends - summary of fishing mortality estimates over time

Stock Abundance and Biomass Trends - summary of abundance, biomass, and recruitment over time

Projections - results of model runs conducted to estimate stock conditions under various potential future levels of fishing mortality

Scientific Uncertainty - comments on recognized uncertainty around base estimates, as well as sensitivity results of various model projection runs, that must be considered in formulation of catch limits under MSA requirements

Significant Assessment Modifications – notification and brief explanation of change during the SEDAR that affected data use, analytic approaches, or interpretation of results; includes only issues involving significant change that lead to addenda to show revision or correction of the assessment outputs and modifies output parameters

Special Comments – statements of comments of importance not provided for in other paragraphs

Sources of Information – a statement naming the parent SAR and the workshop report or addenda from which summary information was taken

Tables and Figures – preferred content of workshop presentations of recent stock and fishery conditions; follow Sources of Information except as noted; data provided in spreadsheet format (Xcel is preferred) to facilitate ASR

#### Tables

- Catch and discards by fishery sector
- Fishing mortality estimates
- Stock abundance and biomass
- Spawning stock biomass
- Recruitment

Figures

- Landings
- Discards
- Fishing Mortality
- Stock Biomass
- Abundance Indices
- Stock-Recruitment
- Yield per Recruit
- Stock Status and Control Rule
- Projections

6. SIS Form [Lead Analyst]

7. SEDAR Abbreviations [SEDAR]

## Action II

Amend the SEDAR Guidelines, Version 17 by inserting the following after Appendix 8.3.  
Renummer all subsequent appendices.

**The effect of the amendment is to provide guidance for preparation of assessment summary reports for stock assessments performed through the SEDAR process.**

### Appendix 8.4

#### **Guidance for Preparation of Assessment Summary Reports for Stock Assessments Performed through the SEDAR Process**

##### **General**

A fishery stock assessment report (SAR) is typically a large and complex document. SEDAR SARs are composed of three major workshop reports plus associated recommendations, addenda, and updates. The SAR is developed for consumption by technical users, specifically science and statistical committees, technical committees, other scientific interests, and future assessment teams. While documentation of the technical content of a stock assessment is necessary and accomplished in a complete SAR, a concise summary of significant findings proves useful to all users, particularly to those involved with utilization of results for resource management and delivery to the public. Chapter 5 of the SAR Introduction, SAR Section I, is the Assessment Summary Report (ASR). It is designed and compiled primarily with policy makers, resource managers, and the interested non-technical reader in mind. All contents of the ASR are from the complete SAR. Normally the SEDAR Coordinator assigned to the specific SEDAR will be the principal compiler the ASR.

##### **SAR Outline**

The outline of contents required in a SAR developed for an assessment conducted through the SEDAR process is displayed in **Appendix 8.2** of the SEDAR Guidelines. The ASR is Chapter 5 of the **SAR Introduction (Section I)**.

A SAR is released in peer review (pre-RW) form and final (post-RW) form. Components of the two forms of SARs follow.

**Table 1. Components of the two forms of a SEDAR Stock Assessment Report**

<b>SAR Section</b>	<b>Released for Peer Review</b>	<b>Final SAR</b>
I Introduction	with preliminary ASR	with final ASR
II Data Workshop Report	yes	yes
III Assessment Workshop Report	yes	yes
IV Workshop Recommendations	DW and AW	DW, AW, and RW
V Review Workshop Report	no	yes
VI Addenda	no	yes

### **Assessment Summary Report Purpose**

The purpose of an ASR is to bring together concisely those specific results presented in a parent SAR that are crucial to fishery management and regulation and supportive of general public understanding. ASRs are in a standard, logical format with consistent content which reflects the findings of the three-workshop SEDAR process. An ASR clearly presents an overview of biological and fishery data that inform the analytical process, describes the types of models employed and their application to the stock under assessment, details the assessment findings and recommendations of the Analytical Team, and relates the essence of Review Panel advice. It refers the reader to relevant SAR components where details of these matters are given.

Use of tables and graphics for presentation is encouraged. An ASR is prepared to be extracted as a stand alone document and should be identified as **Stock Assessment Report Section I, Chapter 5**. An ASR does not report technical detail sufficient for a full understanding of the stock assessment or its results. Readers needing that level of detail should read the complete SAR.

### **Assessment Summary Report Outline**

ASRs should have consistency and continuity of format and content among assessments, particularly for the same species across jurisdictions or different stocks within jurisdictions. Consistency will also make it much easier for the target audience as well as the casual reader to find crucial information from one assessment to the next. The report outline and contents may be customized for each stock within each SEDAR via approved Terms of Reference (ToR) in accord with the specific management criteria called for by the controlling fishery management plan (FMP). Modifications, both additions and removals, must be approved by the SEDAR partners involved in the particular assessment to ensure that partners and other users receive content that suits their needs. It must be remembered there will be readers and users other than the lead SEDAR partner. Justification for modifications should be documented in the ASR. If the SEDAR partners do not modify the outline, the standard will be used.

The SEDAR Coordinator will modify the standard ASR outline accordingly once ToR are approved and the Management Review (SAR Section I, Chapter 2) is submitted by the SEDAR partners involved. The Coordinator then will issue the SAR outline including the ASR outline to all members of the DW working groups and the assessment panel. While unneeded components of the ASR may be removed by the lead SEDAR partner with management responsibility, other components of the SAR that are unneeded in accord with the ToR will remain in the SAR and reported as, **“This component is not used in this assessment.”**

### **Preliminary Assessment Summary Report**

A preliminary ASR is prepared in stages during the three workshop process. During and following the DW the DW Panel and the SEDAR Coordinator ensure all DW-relevant elements (text, tables, and figures) of the ASR are provided in the DW Report (SAR Section II). The SEDAR Coordinator extracts appropriate material from the DW report to prepare a preliminary ASR. The preliminary ASR is made available as information to DW workgroup members and is issued to Assessment Workshop (AW) panelists noting the outline elements that must be included in the AW Report (SAR Section III). Similarly, following the AW the Coordinator will rely on the analytical team to upgrade the ASR with AW materials and will provide it to the RW chair. At the discretion of the RW chair, the preliminary ASR may be issued to the review panel; however, the review panel has no responsibility to contribute to or improve the preliminary ASR. The final ASR will reflect changes made during the RW, based on the RW report (SAR Section V). Any preliminary report must be noted on its cover as **“Not for Further Distribution”**.

As the ASR compiler the SEDAR Coordinator will work with data workgroup leaders, the analytical team, and the RW chair to fact-check and finalize the ASR and issue it within the final SAR. The SEDAR coordinator has appropriate leeway to develop and revise summary reports as necessary and is authorized to modify the ASR if assessment results are revised after the final SAR is disseminated.

### **Assessment Summary Report Components and Content**

The ASR must be a stand-alone document; however the source within the SAR of all information, tables, and figures must be noted in the ASR component where employed. Titles of required paragraphs and expected content of tables and figures are specified in this appendix. Textual components (topical paragraphs) are titled and sequential, but unnumbered paragraphs; this should aid in extraction of text by managers, regulators, and other users.

Reference to components of the three workshop reports are encouraged to guide the reader to specific sources within the SAR, including tables and figures. Use of bulleted points is allowed within grammatically constructed sentences. Preferably an ASR will contain no more than four pages of text.

Preliminary and final reports will be issued in unalterable text (.pdf format); however, construction and editorial efforts should employ alterable text formats. MS Word is the expected word processing software, and spreadsheet, tabulated, and graphics products must be fully compatible with MS Word.

Tables and figures will be numbered based on their order in the ASR; captions for figures and tables that are extracted directly from other sections of the SAR should note the original source numbering. In the outline tables and figures follow all topical paragraph text, except tables and figures supporting **Stock Status and Determination Criteria** must appear within that component in the running text.

Although not a component of a SAR, the SEDAR Data Workbook is a spreadsheet product of the three workshop SEDAR process. The workbook compiles all data employed in the assessment and must be available for preparation of consolidated tables and figures for the ASR, if necessary, and for use by SERO, council, and commission staff when developing fishery management plan related actions.

The ASR will contain only information presented in the data, assessment, review, or addenda components of the SAR and will not present added data, analysis, interpretation, recommendations, or conclusions. It may present material more concisely than in the workshop report components. An example would be a table of relevant data extracted from a series of tables containing more information not appropriate or too extensive for the summary report.

## **Topical Paragraphs Required in an Assessment Summary Report**

### **Stock Status and Status Determination Criteria**

This paragraph presents the current assessment findings of stock status and the criteria on which they are based. Status must be in terms of overfished condition and whether the stock is subject to overfishing. Where known, status determinations of the most recent previous stock assessment should be stated. Results presented here are replies to the specific SEDAR Terms of Reference relative to SFA benchmarks or alternative benchmarks. General statements of biomass, stock abundance, yield per recruit, recruitment, and fishing mortality, and their trends, should be included. Data related to these topics are too extensive to incorporate into the ASR, so give references to the details in the workshop reports where discussed.

Recommendations related to overfishing limits consistent with ACL guidance should be restated here. Salient specific findings may be included in the text, but having them in a table is necessary. This is the only topical paragraph containing supporting table or figures. Table 2 or a similar format should be used to present the criteria used to determine status and the values recommended by the assessment. Criteria must be consistent with the Terms of Reference.

Recommendations and conclusions of the Review Panel should be restated here.

**Table 2. Stock Status Summary**

Criteria	Recommended Values	
	Definition	Value
MSST (Pounds SSB)	$(1-M)SS_{MSY}$	509 mt
MFMT (Full F)	$F_{MSY}$	0.21
MSY (gutted weight)	Yield at $F_{MSY}$	7.72 mp
$F_{MSY}$	$F_{MSY}$	0.21
OY (gutted weight)	Yield at $0.75 * F_{MSY}$	7.6 mp
$F_{OY}$	$0.75 * F_{MSY}$	0.16
M (base)	--	0.14
Biomass Status	SSB/MSST	0.87
Exploitation Status	F/MFMT	0.85

### Stock Identification and Management Unit

With information found in the DW report, this paragraph describes the fishery stock under assessment and identifies the management unit and management authority as defined in the controlling fishery management plan.

### Species Distribution

Describe the distribution of the species, which often exceeds the geographic extent of the stock under assessment. It may be distributed or concentrated within only a portion of the jurisdiction of the management authority. Restate known migratory or inter-jurisdictional characteristics of the stock which may inform the assessment effort.

### Life History

Species life history information is called for in the DW report and should be summarized in a table similar to Table 4. Information should include available age and growth, percent maturity at age, natural mortality, weight at age, sexual characteristics, fecundity at age, percent maturity at age, and other documented biological variables. Elements reported will vary from one assessment to another; elements found by the life history workgroup to be of significance to the assessment should be reported. If the assessed stock displays peculiar life history traits relative to the species generally, they should be mentioned.

### Assessment Methods

Discuss in summary the modeling approaches taken in the assessment. Name analyses performed to evaluate model assumptions and configuration or to evaluate trends in data.

Tell what model was chosen to evaluate stock status and to provide management advice. Describe the recommended model configuration in terms of harvest data series employed, catchability variables, scaling, and incorporation of the fishery-dependent and fishery-

independent indices. If a continuity case run is made, explain why including the effect of changing assessment models.

Recommendations and conclusions of the Review Panel relevant to model selection should be restated here.

**Assessment Data**

Provide a listing of all fishery dependent and fishery independent data and indices employed in the base model run or any sensitivity run. Elements will include data type, research or survey source, fishery sector and gear, time series, and state or other area distinction. Data sources discussed during the DW but recommended to be rejected for the assessment are named in the DW report and should not be restated in the ASR. Table 4 and Table 5 may serve as examples.

**Release Mortality**

Relate the treatment given in the SAR to information about fish released in each fishery sector by gear. State specific mortality estimates found in references or determined during the assessment.

**Catch Trends**

Discuss the principal fisheries on the assessed stock in terms of catch by gear or across the management unit, with relative contributions in quantitative terms. Include salient economic or regulatory events that may have influenced harvest trends. Point out extremes of catch over time, particularly if they are greatly different or abrupt. When available, discards as a portion of total removals should be highlighted and discussed separately. Workshop findings of live versus dead discards should be mentioned.

**Fishing Mortality Trends**

Report in tabular form annual estimates of instantaneous fishing mortality (F) reported for each fishery, including those for both discard and directed components. Restate quantitatively the estimated total apical fishing mortality for sectors of the directed fishery as reported in the Data Workshop Report. Offer summary statements on findings of fishing mortality trends, noting extremes and status at the assessment terminal year in quantitative terms. Note what trend recommendations were used in development of the assessment model.

If F is estimated separately for landings and discards or by fishing sector, age, or year, each should be presented in the ASR. Give references to the details in the workshop reports where discussed.

**Stock Abundance and Biomass Trends**

Stock abundance findings and recommendations of the DW are reported here. Specify the unit of measure defining stock abundance and relate the average over the assessment period, the estimated level at the terminal year, and any trend recognized over the period.

Define spawning stock as used in the assessment, such as biomass of mature females, overall biomass, or total female gonad weight. Describe and enumerate any recognized trend in estimated spawning stock, or other biomass measure, over the assessment period and state the estimated figure for the terminal year of the assessment.

Estimated recruitment is reviewed. Describe averages and any noted trends, and specify notably weak or strong year classes over the assessment period. Specify if the species is a batch or continuous spawner in the management unit.

If provided in a workshop report, a yield per recruit figure must be included as ASR content. If yield per recruit analyses are not reported in the workshop report, selectivities by age and sector or gear type are reported when available.

### **Projections**

Projections attempt to describe the condition of the assessed stock as the model envisions it under various future levels of fishing mortality. The ASR reports projections in terms of fishing levels, biomass targets, or the likelihood of meeting rebuilding plans at current and modified harvest allowances. Restate the sources and effects of uncertainty surrounding the projections. Use a figure to depict projections formulated during or following the assessment or the review.

### **Scientific Uncertainty**

Science and statistics committees of management entities are increasingly interested in the uncertainty of assessment findings that must be considered in formulation of catch limits under MSA requirements. Scientific uncertainty implicated in assessment findings are often discussed in SARs, and a concise summation should be given in the ASR. It should include uncertainty around base estimates as well as sensitivity results of various model projection runs discussed in the SAR.

Recognized sources and effects of uncertainty surrounding the biological characteristics of the species, the data, and the model must be reported here. Discussions of uncertainty impinging on the scientific results of the assessment are repeated here. Data gaps which enhance uncertainty and recommendations to resolve the issue are reviewed. Propose specific data improvement solutions, if stated elsewhere in the SAR.

Recommendations and conclusions of the Review Panel relative to the impact of scientific uncertainty on assessment results should be restated here.

### **Addenda and Significant Assessment Modifications**

This paragraph alerts the reader to issues which brought about significant change during the three-workshop SEDAR process. It summarizes the modification and refers the reader to various components of the SAR where the issues are discussed and can be followed. Given its intentionally brief framework the ASR does not track the changes

Tracking changes through a SEDAR cycle strengthens an understanding of an assessment's development and outcome. Workshop reports document decisions and recommendations, along with discussions preceding them and changes made after them. The ASR notes where changes made in decisions or recommendations affect the assessment. This becomes most important when change affects data use, analytic approaches, or interpretation of results and modifies output parameters. As examples, an analytic team may recognize improvements to their modeling approach or the need for error correction following release of the AW report. Review panels may make recommendations relative to data use, model choice or configuration, sensitivities, or projections. Any of these occurrences would require an addendum reportable in the final SAR. Given its intended use, only issues involving significant change will be tracked in the ASR, such as those that lead to a complete revision or correction of the assessment outputs in the form of addenda.

Though no single SAR component tracks change, the pertinent information resides in the SAR. If needed the ASR directs the reader to these relevant SAR components.

1. The normal workshop report components related to the matter. Documenting decisions and explaining change are specific purposes of the three workshop reports.
2. **Notice of Addenda and Revisions.** This component of the AW report Introduction (**SAR Section III, sub-item 1.1.5**) is early notification if addenda and revisions appear in SAR Section VI. It may be completed or updated post-RW but prior to issuance of the SAR.
3. **Data Review and Update.** This AW chapter, prepared by the lead analyst and the data compiler, details any deviations from DW recommendations in how or what data are used in the assessment modeling.
4. **Revisions and Corrections to the Preceding Sections (SAR Section VI).** Presented here are actual revisions to model type or configuration, new projections and sensitivities, and corrections to the three workshop reports. These may be highly significant changes that nullify and displace major SAR components.

### Special Comments

This paragraph may serve to reflect on meaningful findings or recommendations derived from data preparation, stock assessment, or assessment review, not called for in the preceding paragraphs. The ASR compiler may draw from workshop reports to recount extraordinary circumstances that have significant impact on the assessment or stock status, such as exceptional cohorts or weather events. Data workgroup leaders, assessment panel members, and reviewers may choose to contribute to this ASR paragraph; however, their comments must appear in the respective workshop report, too.

**Sources of Information**

Make a statement that names the sources of information presented in the ASR. Normally it will be the SAR for the particular SEDAR being summarized. If a revision occurred or addenda were issued which affected the ASR, they should be specified. Tell the reader how he or she may acquire the SAR or other source document from the SEDAR office or the SEDAR partner that commissioned the SAR. Also, statements may be made in each ASR topical paragraph stating from which workshop report or addendum the information was taken.

Advise readers that the Council or Commission receiving a SEDAR assessment may request additional sensitivity analyses or projection scenarios following release of the final SAR and ASR. Results of such further analyses are not included in the SAR and therefore not reflected in the ASR.

**Summary Report Tables and Summary Report Figures**

The content of tables and especially of figures is very important to the ease of use and therefore the value of the ASR. The listings of table and figure content are preferred content named in simple terms. SEDAR partners may be more specific through development of ToR that call for more certain content. Workshop leaders and assessment analysts determine captions.

Tables and figures present preferred content of workshop presentations of recent stock and fishery conditions. With the exception of a table in Stock Status and Status Determination Criteria, tables and figures follow the topical paragraph Sources of Information. Each table and figure must be referred to from at least one topical paragraph.

Data employed in development of DW report tables and figures must be in the SEDAR data workbook to allow them to be constructed or modified for inclusion in the ASR. The MS Xcel format is preferred. The analytical team assures preferred tables and figures appear in DW or AW report.

**Tables**

Preferred content of tables includes:

- Catch and discards by fishery sector
- Fishing mortality estimates
- Stock abundance and biomass
- Spawning stock biomass
- Recruitment

## Figures

Figures are used to represent:

- Landings
- Discards
- Fishing Mortality
- Stock Biomass
- Abundance Indices
- Stock-Recruitment
- Yield per Recruit
- Stock Status and Control Rule
- Projections

### Recap - Development of a SEDAR Assessment Summary Report

1. As the ASR compiler the SEDAR Coordinator customizes the ASR component of the standard SAR outline in accord with the stock specific needs provided in the ToR approved by the SEDAR partner having management responsibility for the stock under assessment.
2. The stock-specific SAR outline is issued to DW workgroup members noting the ASR elements that must be reported in the DW report.
3. During and following the DW the DW Panel and the SEDAR Coordinator ensure all DW-relevant elements of the ASR are provided for in the DW Report.
4. The SEDAR Coordinator extracts appropriate material (text, tables, and figures) from the DW report and prepares a preliminary ASR.
5. The preliminary ASR is made available as information to DW workgroup members.
6. The preliminary ASR is issued to Assessment Workshop (AW) panelists noting the outline elements that must be included in the AW report.
7. During and following the AW the Assessment Panel and the SEDAR Coordinator ensure all AW-relevant elements of the ASR are provided for in the AW report.
8. The SEDAR Coordinator extracts appropriate material from the AW report and incorporates it into the preliminary ASR.
9. The preliminary ASR is distributed to the AW panel for review and improvement.

10. The preliminary ASR is issued to the Review Panel Chair noting the ASR outline elements that must be included in the Review Workshop (RW) report.
11. During and following the RW the Review Panel Chair and the SEDAR Coordinator ensure all Review-relevant elements of the ASR are provided for in the RW report.
12. The SEDAR Coordinator extracts appropriate material from the RW report to include in the final ASR.
13. The final ASR is released for broad distribution as Chapter 5 of the SAR Section I (Introduction).