

**Reviewer's Report of SEDAR-15 South Atlantic Greater
Amberjack, Red Snapper, and Mutton Snapper Assessment
Review
January 28 - February 1, 2008
Raleigh, North Carolina**

By

Robin Cook

Prepared for

The Center for Independent Experts

44 North Deeside Road
Bielside
Aberdeen
AB15 9DR
UK

Contents

1.	Executive Summary	3
a.	Impetus and goals for the review	3
b.	Main conclusions and recommendations	3
c.	Interpretation of the findings with respect to conclusions and management advice	4
2.	Introduction.....	4
a.	Background	4
b.	Terms of Reference.....	4
c.	Panel membership	4
1.	Date and place.....	5
2.	Acknowledgements.....	5
3.	Summary of Available Information	5
4.	Review of Information used in the Assessment.....	5
a.	Stock structure.....	5
b.	Life history data	5
c.	Catch data.....	5
d.	Abundance indices	6
e.	Length/age composition	6
f.	Effort.....	6
5.	Review of the Assessment Results	7
a.	Methods.....	7
b.	Abundance	7
c.	Fishing mortality	8
d.	Uncertainty.....	8
e.	Projections.....	9
f.	Other	9
6.	Review of Scientific Advice	10
7.	Recommendations.....	10
a.	Data collection and analyses	10
b.	Assessment methods	10
c.	Other.....	10
10.	Appendices.....	11
a.	Bibliography of all material provided	11
b.	Statement of Work	12

1. Executive Summary

a. Impetus and goals for the review

A workshop was convened in Raleigh, NC to review the assessments of the red snapper, South Atlantic greater amberjack and mutton snapper which were part of the SEDAR-15 process. The review was undertaken by three CIE experts and was chaired by an independent chair appointed by the SEFSC. It was not requested to provide management advice.

During the Review Panel meeting, reviewers participated in panel discussions on assessment methods, data, validity, results, recommendations, and conclusions as guided by the Terms of Reference. The reviewers also contributed to a Peer Review Consensus Summary report.

The review panel was provided with a summary report of a data workshop and the assessment workshop as well as supporting working papers. The panel were assisted by the assessment analysts. The documentation was well prepared and greatly assisted the efficiency of the meeting.

b. Main conclusions and recommendations

The panel generally supported the findings of the assessment workshop that red snapper was overfished and that overfishing was occurring, and that greater amberjack was not overfished and that no overfishing was occurring. However, the stock was approaching an overfished condition. In the case of mutton snapper, overfishing did not appear to be occurring but it appeared possible that the stock may be in an overfished condition.

In all three assessments, catch data were highly uncertain, especially in early years. The importance of this source of uncertainty needs to be more fully investigated. In the case of Red snapper and amberjack, it is important to establish a fishery independent abundance index.

The assessment software, especially for the SCA, model should be more thoroughly tested to ensure it can estimate the model parameters correctly.

It is difficult to know whether the perceived unusual life history characteristics for red snapper estimated from the model simply reconcile inconsistencies in the data or whether they are in fact real. Given the apparently very poor state of the stock relative to the mid 20th century, this problem deserves further investigation as a matter of priority.

Sensitivity runs in the assessments should examine the robustness of stock status relative to the biological parameters that determine MSY. These include values for M, growth, fecundity, selectivity and the form of the stock recruitment curve. In fact the approach to uncertainty should be approached from the perspective of 'robustness' rather than 'sensitivity'. This is because one of the core objectives of the assessment is to be able to

evaluate the status of the stock relative to reference points. The question for uncertainty is therefore how robust that evaluation is from the assessment.

Projection software tools should be developed that can incorporate uncertainty in the initial conditions and capture process error more comprehensively for the forecast period.

c. Interpretation of the findings with respect to conclusions and management advice

Further consideration needs to be given to a more robust means of interpreting stock status rather than the reliance on limited sensitivity runs from one assessment model. It would be desirable to use several modeling approaches to fully explore the range of uncertainty.

It is also important for managers to know the probability of exceeding reference points in the medium term, even if present stock status is judged satisfactory. This is important in the case of amberjack, where stock biomass is close to the MSY threshold.

2. Introduction

a. Background

The SEDAR process includes a review workshop to consider stock assessments that evaluate stock status and provide a basis for management advice. The present panel contributed to the Review Workshop that examined stocks of red snapper, greater amberjack and mutton snapper. The panel comprised three CIE reviewers, a reviewer nominated by the SAFMC and a chair from NMFS NEFSC.

b. Terms of Reference

The specific duties of the reviewers are contained in the Statement of Work appended to this report. The specific terms of reference for the SEDAR-15 Review Workshop are also given in the same document.

c. Panel membership

Kevin Friedland (chair)
Joseph Hightower
Vivian Haist
Graham Pilling
Robin Cook

1. Date and place

The review workshop took place at the Holiday Inn Brownstone hotel in Raleigh, North Carolina from 1:00 p.m. Monday, January 28, 2008 through 1:00 p.m. Friday, February 1, 2008.

2. Acknowledgements

Thanks are due to Doug Vaughan, Kyle Shertzer, Erik Williams and Bob Muller for their work in presenting the assessments and providing additional runs; Paul Conn, Bob Cheshire and Joe O'Hop for acting as rapporteurs.

3. Summary of Available Information

The principal information provided consisted of the SEDAR 15 Data Workshop Summary reports and the SEDAR 15 Assessment Summary Reports for the three species. The working documents presented at these two workshop meetings were also provided. The documents were made available approximately one week before the meeting. They are listed in the Bibliography.

Compared with other review processes (SARCs and STAR panels), the standard of documentation is extremely high. The three principal data and assessment reports were very clearly presented and were complete. They were also made available in advance of the meeting. This made the effectiveness of the Review meeting much greater. All those concerned in the process should take credit for this.

4. Review of Information used in the Assessment

a. Stock structure

Limited information was available on stock structure which meant that all stocks were assessed as single stock units.

b. Life history data

The SEDAR 15 Data Workshop Reports summarise the life history data. The workshop recommended values to be used in assessments. For some values such as growth and fecundity these were based on actual observations. Conventional methods were used to estimate natural mortality based on observed maximum age using the Hoenig and Lorenzen approaches.

c. Catch data

Catch data present many challenges because of incomplete official recorded landings and a large component taken in recreational fisheries. These portions of the catch have therefore had to be raised from samples or surveys and are subject to estimation error.

This error has not been quantified and may have implications for the values estimated in the assessment models. This is because the models were typically configured to fit the catch almost exactly and hence errors in the catch appear in the estimates of F and other parameters. This is an important source of uncertainty which was not examined in great depth in the analyses.

In the case of red snapper, the assessment workshop had included catch values for the recreational fishery that were rejected by the data workshop. This change makes a large difference to the perceived rate of decline on the stock. However, on balance, the review panel felt the inclusion of these data was preferred but it is indicative of large uncertainties in the data which inevitably affect the assessment.

d. Abundance indices

In the case of red snapper, no fishery independent surveys were used and only three fishery dependent series were included. These cover a relatively short period and will be vulnerable to bias due non random sampling by the fisheries and drift in catchability. The latter was corrected by assuming a 2% annual increase in catchability, which while reasonable, is somewhat *ad hoc*. Similar problems affect the amberjack assessment. Clearly the absence of a fishery independent survey for these assessments is a significant weakness and efforts should be made to establish such a series.

For mutton snapper, some fishery independent survey data were available but in most cases the spatial coverage is very small and the indices may not track population change over the assessment area adequately.

e. Length/age composition

Very limited age and length information is available. Age/length information was used in the assessments but the goodness of fit was very variable and often poor. Selectivity was modelled on age rather than length to simplify the model. It is somewhat unrealistic modelling selectivity in this way, especially given the very wide distribution of length at age, and is a limitation of the assessment model used. Since length data do actually exist, it would be worth considering using such data directly in the assessment model.

In the case of mutton snapper, lengths were converted to age compositions using aggregate age-length keys (ALKs) in order to be able to run the ASAP model. Aggregating ALKs in this way will tend to average out any annual year class signal and needs to be taken into account when interpreting the estimated recruitment values. It is probably better to choose an alternative model that does not require complete age data.

f. Effort

Effort data were available but were subsumed in the CPUE abundance indices and were thus not included as stand alone data in the assessment.

5. Review of the Assessment Results

a. Methods

The modeling approach for red snapper and amberjack was similar. In both cases the principal tool was the statistical catch-at-age model (SCA) which is conceptually similar to Stock Synthesis. The model is well established, but the software used appears to have only undergone basic testing, and a more comprehensive quality assurance procedure should be applied to ensure that the software does what is intended and that all the parameters are actually estimable.

For the above two stocks, an ASPIC surplus production model was also used for exploratory runs. The software is widely used and tested and should be reliable. In neither case were the results used to evaluate stock status or stock development, which is perhaps disappointing as the simpler assumptions about the data, in many respects more suited to the real limitations in the data available, make the model an appropriate tool for assessment.

In the case of the mutton snapper a wide variety of modeling approaches had been attempted including surplus production models, Stock Reduction Analysis (SRA), a modified DeLury method, VPA and ASAP an age structured model of the SCA type. All the models offer worthwhile investigative tools for the stock assessment, and perhaps greater use could have been made of the various approaches to characterize uncertainty in the assessment. This is especially true for the DeLury method and the SRA. It would have been desirable to calculate benchmark indicators such as MSY/proxy indicators, but the assessment focused largely on the ASAP model as the reference assessment. The panel noted limitations with the ASAP software which forces certain assumptions about the data related to the need for annual age compositions and the shape of the selectivity curves. This meant that the model had to be populated with synthetic age compositions that cannot adequately reflect annual year class strength.

b. Abundance

The red snapper assessment suggests that the stock has been decimated (i.e. reduced to a tenth) since the 1950s. Such a decline, while a consistent result from all model runs, poses a number of questions about the assessment. Early high stock sizes emerging from the model suggest large numbers of older fish to be consistent with the low M values (and long life span) of the fish. Yet this does not appear to be consistent with a very low age of maturity (age 1) and very high steepness in the stock-recruitment relationship which implies a highly resilient and productive stock. This is a highly unusual case since low M is usually associated with low productivity. It is therefore difficult to know whether the perceived life history characteristics are estimated from the model in order to reconcile inconsistencies in the data or whether they are in fact real. Given the apparently very poor state of the stock relative to the mid 20th century, this problem deserves further investigation as a matter of priority.

For amberjack, the stock trajectory shows a slow decline from the 1980s. Currently it is close to SSB_{msy} , in large part because F in the recent past has been close to or above F_{msy} . The proximity of biomass to SSB_{msy} should be a cause for concern given the uncertainties in the assessment.

Biomass in the mutton snapper assessment shows a fairly smooth trend with an initial decline in the 1980s followed by an increase in the last decade. The trend is similar in most of the assessment models used, suggesting the trend is robust, though the absolute scale of the biomass differs for each method. This should not be a cause for concern, but it does illustrate the uncertainty about the absolute (as opposed to relative) biomass in the sea.

c. Fishing mortality

The long term trend in fishing mortality for red snapper since 1950 is one of steep increase up to the 1980s followed by a period of fluctuations well above F_{msy} . Although there appears to be recent decline in F , it still remains well above the MSY threshold. It is very difficult to judge whether the large change in F over the assessment period is a product of uncertainty in the data and if the calculated MSY values are similarly affected.

For amberjack, F increased steadily in the post war period and continued until the 1990s when it levelled off and more recently declined. In some years in the 1990s it exceeded F_{msy} but is currently estimated to be below the MSY threshold.

There is very little trend in F for mutton snapper. The various assessment methods gave differing levels of total F but indicated similar trends. The relative position of current F in relation to reference points was unclear.

d. Uncertainty

Sensitivity analysis was the principal approach used to provide some indication of the uncertainty associated with model assumptions. These methods are all standard and appropriate. However, while the methods are appropriate, the range of sensitivity runs was fairly limited and perhaps does not explore the full envelope of uncertainty. It means that the results given represent only part of the likely uncertainty. Given the significance of MSY in the management of these stocks it is particularly important to examine sensitivities to those values that influence the calculation of MSY reference points. This will include biological parameters relating to M , maturity, growth, fecundity and the structural assumption about the stock-recruitment curve. It would be worth exploring alternative stock recruitment functions as robustness tests.

It would be useful in the future to approach the question of uncertainty from the perspective of robustness of the stock status evaluation to model assumptions rather than the sensitivity of the assessment model to these assumptions. This is because one of the core objectives of the assessment is to be able to evaluate the status of the stock relative to reference points. The question for uncertainty is therefore how robust that evaluation is from the assessment. By investigating how much the reference or baseline assessment

must be reconfigured in order to change, the estimate of stock status will give an indication of robustness.

For mutton snapper, several different assessment methods had been used, which represent a very useful way of looking at how changes in model structural assumptions affect the assessed status of the stock. The assessment workshop, however, had stopped short of following through the application of the methods to examining the stock status for all methods. It would have been useful to pursue this further to gain additional insight into uncertainty.

e. Projections

Projections were based on a stochastic stock-recruitment model with a fixed initial stock size. The approach will therefore only reflect the uncertainty in process error in recruitment. It would be desirable to capture the uncertainty in the initial stock size as well to gain a more realistic view of stock development. As they stand, the projections will probably give a reasonable indication of the mean stock development but will not offer a realistic estimate of the probability envelope for achievement of biomass thresholds.

In the case of red snapper the scenarios in the projections included cases where bycatch only was included. This is a very useful way of examining possible management options in a mixed fishery.

f. Other

There was some discussion at the meeting in relation to Term of Reference IV (see Statement of Work) which asks for a range of ABC catches. The review panel felt that this was effectively asking for management advice. The instructions to the panel were that they should not give advice and therefore no comment was made on ABCs. Clarification of this issue is required for future workshops.

For Red Snapper there are no data in the assessment to adequately define the asymptote of the Beverton-Holt function and hence estimates of MSY indicators cannot be considered reliable. It may be preferable to use the ratio indicators (e.g. $F_{\text{current}}/F_{\text{msy}}$ and $SSB_{\text{current}}/SSB_{\text{msy}}$) to evaluate stock status or use SPR proxies. The panel suggested that $F_{40\%}$ and $SSB_{40\%}$ proxies may be used as limit indicators.

The review panel accepted the values of MSY and F_{MSY} for amberjack because there was adequate contrast in the spawning stock size and recruitment data. These, however, were less robust than the 40% benchmarks. The overwhelming majority of sensitivity runs suggested that the stock was neither overfished nor that overfishing was occurring. The conclusion of the status of the stock therefore appears quite robust to a wide range of model configurations and the panel felt this was the appropriate classification.

In the case of mutton snapper, the panel supported the use of SPR proxies given the unreliability of the stock recruitment relationship. However, there was some doubt that the choice of 30% proxies was appropriate given the life history of the species. The

choice of proxy will ultimately depend on the level of risk managers are prepared to take, but the current choice (30%) may imply high risk.

6. Review of Scientific Advice

The Review Workshop was not asked to provide advice.

7. Recommendations

a. Data collection and analyses

In all three assessments, catch data were highly uncertain, especially in early years. The importance of this source of uncertainty needs to be more fully investigated. In the case of red snapper and amberjack, it is important to establish a fishery independent abundance index.

b. Assessment methods

The assessment software, especially for the SCA model, should be more thoroughly tested to ensure it can estimate the model parameters correctly.

Further consideration needs to be given to a more robust means of interpreting stock status than the rather reliance on limited sensitivity runs from one assessment model. It would be desirable to use several modeling approaches to fully explore the range of uncertainty

c. Other

It is difficult to know whether the perceived unusual life history characteristics for red snapper estimated from the model simply reconcile inconsistencies in the data or whether they are in fact real. Given the apparently very poor state of the stock relative to the mid 20th century, this problem deserves further investigation as a matter of priority.

Projection software tools should be developed that can incorporate uncertainty in the initial conditions and capture process error more comprehensively for the forecast period.

Sensitivity runs in the assessments should examine the robustness of stock status relative to the biological parameters that determine MSY. These include values for M, growth, fecundity, selectivity and the form of the stock recruitment curve. In fact the approach to uncertainty should be approached from the perspective of 'robustness' rather than 'sensitivity'. This is because one of the core objectives of the assessment is to be able to

evaluate the status of the stock relative to reference points. The question for uncertainty is therefore how robust that evaluation is from the assessment.

10. Appendices

a. Bibliography of all material provided

SEDAR15
South Atlantic Red Snapper & Greater Amberjack
Workshop Document List

Document #	Title	Authors
Documents Prepared for the Data Workshop		
SEDAR15-DW1	Discards of Greater Amberjack and Red Snapper Calculated for Vessels with Federal Fishing Permits in the US South Atlantic	McCarthy, K.
Documents Prepared for the Assessment Workshop		
SEDAR15-AW-1	SEDAR 15 Stock Assessment Model - Statistical Catch-at-Age Model	Conn, P., K. Shertzer, and E. Williams
Documents Prepared for the Review Workshop		
SEDAR15-RW1	SEDAR 15 SAR1 (Red Snapper) Peer Review Document	SEDAR 15
SEDAR15-RW2	SEDAR 15 SAR2 (South Atlantic Greater Amberjack) Peer Review Document	SEDAR 15
SEDAR 15-RW3	SEDAR 15 SAR3 (South Atlantic and Florida Mutton Snapper) Peer Review Document	SEDAR 15 (Florida Fish & Wildlife Research Institute)
Final Assessment Reports		
SEDAR15-AR1	Assessment of Red Snapper in the US South Atlantic	
SEDAR15-AR2	Assessment of Greater Amberjack in the US South Atlantic	
Reference Documents		
SEDAR15-RD01	Age, growth, and reproduction of greater amberjack, <i>Seriola dumerili</i> , off the Atlantic coast of the southeastern United States	Harris, P., Wyanski, D., White, D. B.
SEDAR15-RD02 2007.	A Tag and Recapture study of greater amberjack, <i>Seriola dumerili</i> , from the Southeastern United States	MARMAP, SCDNR
SEDAR15-RD03	Stock Assessment Analyses on Atlantic Greater Amberjack	Legault, C., Turner, S.
SEDAR15-RD04	Age, Growth, And Reproduction Of The Red Snapper, <i>Lutjanus Campechanus</i> , From The Atlantic Waters Of The Southeastern U.S.	White, D. B., Palmer, S.
SEDAR15-RD05	Atlantic Greater Amberjack Abundance Indices From Commercial Handline and Recreational	Cummings, N., Turner, S.

b. Statement of Work

Statement of Work for Dr. Robin Cook

SEDAR 15 Stock Assessment Review

South Atlantic Greater Amberjack, Red Snapper, and Mutton Snapper

January 28 - February 1, 2008

Raleigh, North Carolina

SEDAR Overview:

South East Data, Assessment, and Review (SEDAR) is a process for fisheries stock assessment development and review conducted by the South Atlantic, Gulf of Mexico, and Caribbean Fishery Management Councils; NOAA Fisheries Southeast Fisheries Science Center (SEFSC) and Southeast Regional Office (SERO); and the Atlantic and Gulf States Marine Fisheries Commissions. SEDAR is organized around three workshops: data, assessment, and review. Input data are compiled during the data workshop, population models are developed during the assessment workshop, and an independent peer review of the data, assessment models, and results is provided by the review workshop. SEDAR documents include working papers prepared for each workshop, supporting reference documents, and a SEDAR stock assessment report. The SEDAR stock assessment report consists of a data report produced by the data workshop, a stock assessment report produced by the assessment workshop, and a peer review consensus report prepared by the review workshop.

SEDAR is a public process conducted by the Fishery Management Councils in the Southeast US. All workshops, including the review, are open to the public and noticed in the Federal Register. All documents prepared for SEDAR are freely distributed to the public upon request and posted to the publicly accessible SEDAR website. Verbal public comment during SEDAR workshops is taken on an 'as needed' basis; the workshop chair is allowed discretion to recognize the public and solicit comment as appropriate during panel deliberations. Written comments are accepted in accordance with existing Council operating procedures. The names of all participants, including those on the review panel, are revealed.

The review workshop provides an independent peer review of SEDAR stock assessments. The term review is applied broadly, as the review panel may request additional analyses, error corrections and sensitivity runs of the assessment models provided by the assessment workshop panel. The review panel is ultimately responsible for ensuring that the best possible assessment is provided through the SEDAR process. The review panel task is specified in terms of reference.

The SEDAR 15 review panel will be composed of three Center for Independent Experts (CIE)-appointed reviewers, one reviewer appointed by the South Atlantic Council, and a chair appointed by the SEFSC director. Council staff, Council members, and Council AP and SSC members will attend as observers. Members of the public may attend SEDAR review workshops.

Overview of CIE Peer Review Process:

The Office of Science and Technology implements measures to strengthen the National Marine Fisheries Service's (NMFS) Science Quality Assurance Program (SQAP) to ensure the best available high quality science for fisheries management. For this reason, the NMFS Office of Science and Technology coordinates and manages a contract for obtaining external expertise through the Center for Independent Experts (CIE) to conduct independent peer reviews of stock assessments and various scientific research projects. The primary objective of the CIE peer review is to provide an impartial review, evaluation, and recommendations in accordance to the Statement of Work (SoW), including the Terms of Reference (ToR) herein, to ensure the best available science is utilized for the National Marine Fisheries Service management decisions.

The NMFS Office of Science and Technology serves as the liaison with the NMFS Project Contact to establish the SoW which includes the expertise requirements, ToR, statement of tasks for the CIE reviewers, and description of deliverable milestones with dates. The CIE, comprised of a Coordination Team and Steering Committee, reviews the SoW to ensure it meets the CIE standards and selects the most qualified CIE reviewers according to the expertise requirements in the SoW. The CIE selection process also requires that CIE reviewers can conduct an impartial and unbiased peer review without the influence from government managers, the fishing industry, or any other interest group resulting in conflict of interest concerns. Each CIE reviewer is required by the CIE selection process to complete a Lack of Conflict of Interest Statement ensuring no advocacy or funding concerns exist that may adversely affect the perception of impartiality of the CIE peer review. The CIE reviewers conduct the peer review, often participating as a member in a panel review or as a desk review, in accordance with the ToR producing a CIE independent peer review report as a deliverable. At times, the ToR may require a CIE reviewer to produce a CIE summary report. The Office of Science and Technology serves as the COTR for the CIE contract with the responsibilities to review and approve the deliverables for compliance with the SoW and ToR. When the deliverables are approved by the COTR, the Office of Science and Technology has the responsibility for the distribution of the CIE reports to the Project Contact.

CIE Reviewer Requirements:

The CIE shall provide three CIE reviewers to conduct independent peer reviews in accordance with the ToR and Schedule herein, and each CIE reviewer's duties shall not exceed a maximum of 14 days for pre-review preparations, conducting the peer review at the SEDAR 15 panel review meeting, and completion of the CIE independent peer review reports. The CIE reviewers shall participate as technical reviewers on the SEDAR 15 review panel that will consider assessments of South Atlantic greater amberjack, red snapper, and mutton snapper, and these stocks are assessed within the jurisdiction of the South Atlantic Fishery Management Council and the states of North Carolina, South Carolina, Georgia, and Florida. The CIE reviewers shall have expertise in stock assessment, statistics, fisheries science, and marine biology to complete their primary task of conducting an impartial and independent CIE peer review report in accordance with the ToR to determine if the best available science is utilized for fisheries management decisions. The CIE reviewers shall not provide comments on fisheries management decisions.

Statement of Tasks for CIE Reviewers:

Roles and responsibilities:

1. Approximately 3 weeks prior to the meeting, CIE reviewers shall be provided with stock assessment reports, associated supporting documents, and review workshop instructions including terms of reference. CIE reviewers shall read these documents to gain an in-depth understanding of the stock assessment, the resources and information considered in the assessment, and responsibilities as reviewers.
2. During the review panel meeting, reviewers shall participate in panel discussions on assessment methods, data, validity, results, uncertainties, recommendations, and conclusions as guided by the terms of reference. Each CIE reviewers shall conduct an independent peer review and participate in development of a peer review consensus summary report for each assessment reviewed, as described in Annex I. CIE reviewers may be asked to serve as an assessment leader during the review to facilitate preparing first drafts of review summary reports.
3. Following the review panel meeting, reviewers shall work with the chair to complete and review the peer review consensus summary reports. Reports shall be completed, reviewed by all panelists, and comments submitted to the Chair by February 15, 2008.
4. Following the review panel meeting, each reviewer appointed by the CIE shall prepare an individual CIE reviewer report. These reports shall be submitted to the CIE no later than February 22, 2008, addressed to the "University of Miami Independent System for Peer Review," and sent to Dr. David Sampson, via email to David.Sampson@oregonstate.edu, and to Mr. Manoj Shivlani, via email to

mshivlani@ntvifederal.com. See Annex II for complete details on the report outline.

The duties of each review panelist shall not exceed a maximum of 14 workdays; several days prior to the meeting for document review; five days at the SEDAR meeting; and several days following the meeting to complete the independent peer review in accordance with the ToR, and to ensure final review comments and document edits are provided to the Chair.

The CIE reviewers shall conduct necessary preparations prior to the peer review, conduct the peer review, and complete the deliverables in accordance with the ToR and deliverable dates herein.

Prior to the Peer Review: The CIE shall provide the CIE reviewers contact information (name, affiliation, address, email, and phone) to the Office of Science and Technology COTR no later than the date as specified in the SoW, and the COTR will forward this information to the Project Contact.

Pre-review Documents: Approximately two weeks before the peer review, the Project Contact will send the CIE reviewers the necessary documents for the peer review, including supplementary documents for background information. The CIE reviewers shall read the pre-review documents in preparation for the peer review. This list of pre-review documents may be updated prior to the panel review meeting. Meeting materials will be forwarded electronically to review panel participants and made available through the internet (<http://www.sefsc.noaa.gov/sedar/>); printed copies of any documents are available by request. The names of reviewers will be included in workshop briefing materials.

Panel Peer Review Meeting: The CIE reviewers shall participate and conduct the peer review participate during a panel review meeting as specified in the dates and location of the attached Agenda and Schedule of Deliverable.

The review workshop will take place at the Holiday Inn Brownstone in Raleigh, North Carolina, from 1:00 p.m. Monday, January 28, 2008 through 1:00 p.m. Friday, February 1, 2008. The Project Contact is responsible for the facility arrangements.

Please contact Dale Theiling (SEDAR Coordinator; (843) 571-4366, Dale.Theiling@safmc.net) or John Carmichael, (Science and Statistics Program Manager; (843) 571-4366, John.Carmichael@safmc.net) for additional details.

Hotel arrangements:

Holiday Inn Brownstone
1707 Hillsborough Street
Raleigh, NC 27605
Phone: (919) 828-0811 / (800) 331-7919

Group “SEDAR” Rate: $\$80 + (12.75\% \text{ tax of } 10.20) = \90.20 ; rate is guaranteed through December 14, 2007.

SEDAR Review Workshop Panel Tasks:

The SEDAR 15 review workshop panel will evaluate assessments of South Atlantic greater amberjack, red snapper, and mutton snapper. During the evaluation the panel will consider data, assessment methods, and model results. The evaluation will be guided by terms of reference that are specified in advance. The review workshop panel will document its findings regarding each assessment in a peer review consensus summary (Annex I). (Note that the consensus summary is a SEDAR product, not a CIE product.) Separate CIE reviewer reports will be produced as described in Annex II to provide distinct, independent analyses of the technical issues and of the SEDAR process.

Each CIE reviewer shall participate on the SEDAR 15 workshop panel to conduct an impartial and independent peer review with the purpose of determining whether the best available science was utilized. This review shall be conducted in accordance with SEDAR Guidelines and the specific Terms of Reference (ToR) specified below. Each CIE reviewer shall contribute to a SEDAR consensus summary in accordance with Annex I that will be compiled by the review panel Chair, and shall produce a CIE independent peer review report in accordance with Annex II.

Terms of Reference:

SEDAR 15 Review Workshop Terms of Reference (apply to each stock):

- I. Evaluate the adequacy, appropriateness, and application of data used in the assessment.
- II. Evaluate the adequacy, appropriateness, and application of methods used to assess the stock.
- III. Recommend appropriate estimates of stock abundance, biomass, and exploitation measures.
- IV. Evaluate the methods used to estimate population benchmarks and management parameters (*e.g., MSY, F_{msy}, B_{msy}, MSST, MFMT, or their proxies*); provide estimated values for management benchmarks, a range of allowable catch (ABC), and declarations of stock status relative to benchmarks.
- V. Evaluate the adequacy, appropriateness, and application of the methods used to project future population status; recommend appropriate estimates of future stock condition (*e.g., exploitation, abundance, biomass*).
- VI. Evaluate the adequacy, appropriateness, and application of methods used to characterize uncertainty in estimated parameters. Provide measures of uncertainty for estimated parameters. Ensure that the implications of uncertainty in technical conclusions are clearly stated.

- VII. Ensure that stock assessment results are clearly and accurately presented in the stock assessment report and advisory report and that reported results are consistent with review panel recommendations.
- VIII. Evaluate the SEDAR Process. Identify any terms of reference which were inadequately addressed by the data or assessment workshops; identify any additional information or assistance which will improve review workshops; suggest improvements or identify aspects requiring clarification.
- IX. Review the research recommendations provided by the data and assessment workshops and make any additional recommendations warranted. Clearly indicate research and monitoring needs that may appreciably improve the reliability of future assessments. Recommend an appropriate interval for the next assessment.
- X. Prepare a peer review consensus summary summarizing the panel's evaluation of each stock assessment and addressing each term of reference. (Reports to be drafted by the panel during the review workshop with a final report due two weeks after the workshop ends.)

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

The panel shall ensure that corrected estimates are provided by addenda to the assessment report in the event (1) corrections are made in the assessment, (2) alternative model configurations are recommended, or (3) additional analyses are prepared as a result of review panel findings regarding the TORs above.

These Terms of Reference may be modified prior to the Review Workshop. If so, final terms of reference will be provided to the reviewers with the workshop briefing materials.

SEDAR Review Workshop Panel Supplementary Instructions

The review panel Chair is responsible for reviewing documents prior to the workshop, conducting the meeting during the workshop in an orderly fashion, compiling and editing the peer review consensus summary for each species assessed and submitting it to the SEDAR Coordinator by a deadline specified by the SEDAR Steering Committee. The review panel chair will work with SEDAR staff to complete the SEDAR advisory report. The review panel chair may participate in panel deliberations and contribute to report preparation.

Review panel members are responsible for (1) reviewing documents prior to the workshop, (2) participating in workshop discussions addressing the terms of reference, (3) preparing assessment summaries and consensus reports during the workshop, and (4) finalizing SEDAR documents within two weeks of the conclusion of the workshop. Each

reviewer appointed by the CIE is responsible for preparing an additional CIE reviewer report as described in Annex II.

The Chair and SEDAR Coordinator will work with the appointed reviewers to assign tasks during the workshop. For example, the Chair may appoint one panelist to serve as assessment leader for each assessment covered by the review, with the leader responsible for providing an initial draft consensus report text for consideration by the panel. Reviewers may alternatively be assigned particular terms of reference to address initially. Regardless of how initial drafting is accomplished, all panelists are expected to participate in discussion of all terms of reference and contribute to all aspects of the review.

The review panel's primary responsibility is to determine if assessment results are based on sound science, appropriate methods, and appropriate data. During the course of the review, the panel is allowed limited flexibility to deviate from the assessment provided by the assessment workshop. This flexibility may include (1) modifying the assessment configuration and assumptions, (2) requesting a reasonable number of sensitivity runs, (3) requesting additional details and results of the existing assessments, or (4) requesting correction of any errors identified. However, the allowance for flexibility is limited, and the review panel is not authorized to conduct an alternative assessment or to request an alternative assessment from the technical staff present. The review panel is responsible for applying its collective judgment in determining whether proposed changes and corrections to the presented assessment are sufficient to constitute an alternative assessment. The review panel chair will coordinate with the SEDAR Coordinator and technical staff present to determine which requests can be accomplished and to prioritize desired analyses.

Any changes in assessment results stemming from modifications or corrections solicited by the review panel will be documented in an addendum to the assessment report. If updated estimates are not available for review by the conclusion of the workshop, the review panel shall consult with technical staff present and the SEDAR Coordinator to develop an acceptable process for reviewing the final results within the time allotted for completion of the project.

The review panel should not provide advice addressing specific management actions. Such advice will be provided by existing Council committees, such as the Science and Statistical Committee and Advisory Panels, following completion of the assessment. The review panel is free to point out items of concern regarding past or present management actions that relate to population conditions or data collection efforts.

If the review panel finds an assessment deficient to the extent that technical staff present cannot resolve the deficiencies during the course of the workshop, or the panel deems that desired modifications would result in a new assessment, then the review panel shall provide in writing the required remedial measures, including an appropriate approach for correcting and subsequently reviewing the assessment.

Workshop Final Reports:

The SEDAR Coordinator will send copies of the final review panel consensus report and the complete SEDAR stock assessment report for each stock assessed to Mr. Manoj Shivlani at the CIE.

Submission and Acceptance of CIE Reports:

Upon review and acceptance of the CIE reports by the CIE Coordination and Steering Committees, CIE shall send via e-mail the CIE reports to the COTRs (William Michaels William.Michaels@noaa.gov and Stephen K. Brown Stephen.K.Brown@noaa.gov) at the NMFS Office of Science and Technology by the date in the Schedule of Deliverables. The COTRs will review the CIE reports to ensure compliance with the SoW and ToR herein, and have the responsibility of approval and acceptance of the deliverables. Upon notification of acceptance, CIE shall send via e-mail the final CIE report in *.PDF format to the COTRs. The COTRs at the Office of Science and Technology have the responsibility for the distribution of the final CIE reports to the Project Contacts.

The COTR shall provide the final CIE reviewer reports to:

SEFSC Acting Director: Alex Chester, NMFS Southeast Fisheries Science Center, 75 Virginia Beach Drive, Miami, FL 33149 (email, Alex.Chester@NOAA.gov)

SEDAR Coordinator: Dale Theiling, SAFMC, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405 (email, Dale.Theiling@safmc.net). (SEDAR shall provide the final CIE Reviewer Reports to the SEDAR Steering Committee and Executive Directors of those Councils having jurisdiction over the included stocks)

Schedule of Deliverables:

- February 1, 2008: review panel completes first draft of review panel consensus reports (conclusion of review workshop)
- February 15, 2008: review panel submits final draft review panel consensus reports to workshop Chair.
- February 22, 2008: workshop Chair submits final review panel consensus reports and SEDAR advisory reports to SEDAR Coordinator.
- February 22, 2008: CIE technical reviewers submit individual reviewer reports to CIE.
- February 29, 2008: SEDAR Coordinator submits final review panel consensus reports and SEDAR stock assessment reports to CIE.
- March 7, 2008: CIE submits individual CIE reviewer reports to the COTR.
- March 11, 2008: COTR notifies CIE regarding individual reviewer report acceptance.
- March 13, 2008: CIE provides final individual CIE reviewer reports to COTR.
- March 21, 2008: COTR provides final CIE reviewer reports to SEFSC Acting Director and SEDAR Coordinator.
- March 26, 2008: SEDAR submits individual CIE reviewer reports to the SEDAR Steering Committee and Councils.

Key Personnel:

Contracting Officer's Technical Representative (COTR):

William Michaels
NMFS Office of Science and Technology
1315 East West Hwy, SSMC3, F/ST4, Silver Spring, MD 20910
William.Michaels@noaa.gov Phone: 301-713-2363 ext 136

Stephen K. Brown
NMFS Office of Science and Technology
1315 East West Hwy, SSMC3, F/ST4, Silver Spring, MD 20910
Stephen.K.Brown@noaa.gov Phone: 301-713-2363 ext 133

Contractor Contacts:

Manoj Shivilani, CIE Primary Coordinator
10600 SW 131st Court, Miami, FL 33186
mshivilani@ntvifederal.com Phone: 305-383-4229

Roger Peretti, NTVI Regional Director
Northern Taiga Ventures, Inc., 814 W. Diamond Ave., Ste. 250, Gaithersburg, MD 20878
rperetti@ntvifed.com Phone: 301-212-4187.

SEDAR Project Contact (or Emergency):

Dale Theiling, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405
Dale.Theiling@safmc.net Phone: 843-571-4366.

Request for Changes:

Requests for changes shall be submitted to the Contracting Officer at least 15 working days prior to making any permanent substitutions. The Contracting Officer will notify the Contractor within 10 working days after receipt of all required information of the decision on substitutions. The contract will be modified to reflect any approved changes. The Terms of Reference (ToR) and list of pre-review documents herein may be updated without contract modification as long as the role and ability of the CIE reviewers to complete the SoW deliverable in accordance with the ToR are not adversely impacted.

Draft Agenda

SEDAR 15: South Atlantic Greater Amberjack, Red Snapper, and Mutton Snapper
January 28 - February 1, 2008

Monday

1:00 p.m. 1:00 – 1:30	Convene Introductions and Opening Remarks Coordinator <i>- Agenda Review, TOR, Task Assignments</i>	
1:30 – 3:30	Assessment Presentation	TBD
3:30 – 4:00	Break	
4:00 – 6:00	Continue Presentation/Discussion	Chair

Tuesday

8:30 a.m. – 11:30 a.m.	Assessment Presentation	Chair
11:30 a.m. – 1:30 p.m.	Lunch Break	
1:30 p.m. – 3:30 p.m.	Panel Discussion <i>- Assessment Data & Methods</i> <i>- Identify additional analyses, sensitivities, corrections</i>	TBD
3:30 p.m. – 4:00 p.m.	Break	
4:00 p.m. – 6:00 p.m.	Panel Discussion <i>- Continue deliberations</i> <i>- Review additional analyses</i>	Chair

Tuesday Goals: Initial presentations completed, sensitivities and modifications identified.

Wednesday

8:30 a.m. – 11:30 a.m.	Panel Discussion <i>- Review additional analyses, sensitivities</i> <i>- Consensus recommendations and comments</i>	Chair
11:30 a.m. – 1:30 p.m.	Lunch Break	
1:30 p.m. – 3:30 p.m.	Panel Discussion	TBD
3:30 p.m. – 4:00 p.m.	Break	
4:00 p.m. – 6:00 p.m.	Panel Discussion	Chair

Wednesday Goals: Final sensitivities identified, Preferred models selected, Projection approaches approved, Consensus report drafts begun

Thursday

8:30 a.m. – 11:30 a.m.	Panel Discussion <i>- Final sensitivities reviewed.</i> <i>- Projections reviewed.</i>	Chair
11:30 a.m. – 1:30 p.m.	Lunch Break	
1:30 p.m. – 3:30 p.m.	Panel Discussion or Work Session	Chair
3:30 p.m. - 4:00 p.m.	Break	
4:00 p.m. - 6:00 p.m.	Panel Work Session <i>- Review Consensus Reports</i>	Chair

Thursday Goals: Complete assessment work and discussions. Final results available. Draft Consensus Reports reviewed .

Friday

8:30 a.m. – 1:00 p.m.	Panel Work Session	Chair
1:00 p.m.	ADJOURN	

Annex I. SEDAR Review Panel Consensus Summary Report Contents

I. Terms of Reference

List each Term of Reference and provide a summary of Panel discussions and recommendations regarding the particular item. Include a clear statement indicating whether or not the criteria in the Term of Reference are satisfied.

II. Further Analyses and Evaluations

Summary and findings of review panel analytical requests not previously addressed in TOR discussion above.

III. Additional Comments

Summary of any additional discussions not captured in the Terms of Reference statements.

IV. Recommendations for Future Workshops

Panelists are encouraged to provide general suggestions to improve the SEDAR process.

V. Reviewer Statements

Each individual reviewer should provide a statement attesting whether or not the contents of the Consensus Report provide an accurate and complete summary of their views on the issues covered in the review. Reviewers may also make any additional individual comments or suggestions desired.

ANNEX II: Contents of CIE Independent Peer Review Report

1. The reviewer report shall be prefaced with an executive summary of findings and recommendations.
2. The main body of the reviewer's report shall consist of a background, description of the individual reviewer's role in the review activities, a summary of findings, and summary of conclusions and recommendations in accordance with the ToR. Reviewers shall elaborate on any points raised in the Consensus Summary Report that they feel might require further clarification. Reviewers shall provide a critique of the SEDAR process including suggestions for improvements of both process and products. Reviewers should not simply repeat the contents of the consensus summary reports.
3. The reviewer report shall include as separate appendices a copy of the CIE Statement of Work and a bibliography that includes all materials provided for review.

Please refer to the following website for additional information on report generation:
<http://www.rsmas.miami.edu/groups/cie>.