South East Data, Assessment, and Review #10 (SEDAR10)
South Atlantic and Gulf of Mexico Gag Grouper Review Workshop
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Report Prepared

for

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by

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Executive Summary

- A Review Workshop for South Atlantic and Gulf of Mexico gag grouper stock assessments (SEDAR10) was held at the Doubletree Buckhead, Atlanta, Georgia from June 26 to 30, 2006.

- The Review Panel was asked to review the South Atlantic and Gulf of Mexico gag grouper stock assessments as to completeness, correctness, and adequacy under the Sustainable Fisheries Act and to make recommendations for improvements in future data collection and assessments.

- This report provides a summary of the results and recommendations from the workshop. Detailed information is available in the Peer Review Consensus Summaries and Peer Review Advisory Reports, generated as output from the meeting. Perceptions of the assessment process, which are the opinions of the author, are also provided.

- For South Atlantic gag grouper, current rates of exploitation indicate that overfishing is occurring. Relative to the current value of minimum spawning stock threshold (MSST), specified in the fisheries management plan (FMP), this stock is approaching an overfished condition and is projected to fall below the MSST in 2007. Relative to the MSST proposed by the Review Workshop, the stock is not overfished and is not projected to become overfished under any of the proposed projection scenarios. The maximum sustainable yield (MSY) benchmarks in this assessment were deemed useful for management.

- For Gulf of Mexico gag grouper, the current (2004) fishing mortality rate (about 0.4) was estimated to be about 130%-150% higher that the Gulf of Mexico Fishery Management Councils proxy for F_{MSY} ($F_{SPR30\%}$). Estimated recruitment ranged from 1 to 6 million fish over a moderate range of spawning stock sizes, resulting in a high degree of uncertainty about the stock recruitment relationship and estimates of biomass benchmarks. Because of the uncertainty in the biomass benchmarks, current stock status could not be reported. The MSY-based benchmarks in this assessment were not deemed useful for management.

- The SEDAR process, a multi step method to determine fish stock status, is structured around three workshops, a Data Workshop, an Assessment Workshop, and a Review Workshop. The Review Panel was provided with detailed reports from the Data and Assessment Workshops plus access to all working papers from these workshops. For both stocks, this was the first time that they were assessed under the SEDAR process.

Background

The goal of the South East Data, Assessment, and Review (SEDAR) process is to provide an open and transparent process for developing and reviewing scientific information that is critical to management of fish species in the Southeastern United States, including the South Atlantic, Gulf of Mexico, and Caribbean.

The SEDAR Review Workshop is a forum for independent peer review of the data and of assessment methods for stock assessments under the jurisdiction of the South Atlantic Fishery Management Council, the Gulf of Mexico Fishery Management Council, and the Caribbean Fishery Management Council.

The Review Workshop is the third of a multi step process to assess fish stock status. A Data Workshop first reviews input data, including catch statistics, fishery sampling, population monitoring, and species life history. A Stock Assessment Workshop then develops stock assessment models, estimates values for population parameters and stock status benchmarks, and projects future population conditions.

The Review Panel's primary responsibility is to ensure that assessment results are based on sound science, appropriate methods, and appropriate data. During the course of review, the Panel is allowed limited flexibility to deviate from the assessment provided by the Assessment Workshop. This flexibility may include modifying the assessment configuration and assumptions, requesting a reasonable number of sensitivity runs, requesting additional details and results of the existing assessments, or 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 is not to provide specific management advice. Such advice is provided by existing Council Committees, such as the Science and Statistical Committee and Advisory Panels, following completion of the assessment. If the Review Panel finds an assessment deficient to the extent that technical staff present cannot correct 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 must provide in writing the required remedial measures, including an appropriate approach for correcting and subsequently reviewing the assessment.

The Review Workshop produces two reports to accompany each stock assessment. The first is a Peer Review Consensus Summary of the stock assessment that addresses the terms of reference and includes peer review comments on the assessment, the Review Panel's findings on stock and fishery

status, and recommendations regarding biological benchmarks and status determination criteria necessary for management under the Sustainable Fisheries Act (SFA). The second is a Peer Review Advisory Report that summarizes the status of the stock.

The SEDAR10 Review Workshop was held at the Doubletree Buckhead, in Atlanta, Georgia, from June 26 to 30, 2006. The Review Panel was provided with nine terms of reference and was asked to evaluate the assessments of South Atlantic and Gulf of Mexico gag grouper, including consideration of input data, assessment methods, and model results. The SEDAR10 Review Panel consisted of four members, the Chair and three fisheries assessment scientists appointed by the Center for Independent Experts (CIE).

Description of Review Activities

Approximately twelve days prior to the Review Workshop, the SEDAR Coordinator, John Carmichael, distributed electronic copies of the Review Workshop instructions, including the terms of reference, reports from the Data and Assessment Workshops, and access to all working papers (Appendix 1). Upon receipt of the documentation and prior to the meeting, I made hard copies, read each of the documents, summarized assessment results, and developed questions to ask during the meeting.

During the Review Workshop, a detailed presentation of data, models, and results was given for each assessment. The South Atlantic assessment team was led by Dr. Erik Williams and Dr. Doug Vaughan. The Gulf of Mexico team was led by Dr. Mauricio Ortiz, Dr. Steve Turner, and Dr. Clay Porch. Each presentation was followed by extensive question and discussion periods. For both assessments, the assessment teams were asked to provide further analyses that were subsequently reviewed during the meeting. Before the meeting ended, drafts of the Peer Review Advisory Report and Peer Review Consensus Summary were completed for each assessment.

In this report, I have included conclusions and recommendations with the Summary of Findings. I have also divided the Summary of Findings into two parts: 1) a summary for each of the two assessed stocks, and 2) my perceptions of the process. The first part addresses the terms of reference of the meeting and follows closely from the respective Peer Review Consensus Summaries and Advisory Reports. The second part is based mostly upon my observations during the meeting and as such, represents my personal views. Acknowledging that they are personal views, I hope that they will provide an independent perspective to the SEDAR process and will aid in the development of the process.

The Review Panel Chair, Dr. Terry Smith (NOAA National SEAGRANT College Program) was thoroughly prepared prior to the meeting with an in-depth

knowledge and background of each of the assessments. He was adept at allowing all opinions to be expressed and then ensuring that a consensus was met. The Review Panellists (Dr. J. J. Maguire and Dr. Din Chen) each brought unique skills to the panel and provided the knowledge to ensure a thorough review of each of the assessments.

Prior to the Review Workshop, Dr. Smith assigned Dr. Chen as the lead reviewer for the South Atlantic gag grouper assessment. He also asked me to act as lead for the Gulf of Mexico gag grouper assessment. Dr. Maguire was assigned a coordinating role between the two assessments.

Summary of Findings

1) Background

SEDAR10 was charged with assessing gag grouper (*Mycteroperca microlepis*) in the U.S. waters of the South Atlantic and Gulf of Mexico. A separate stock assessment was prepared for each management unit. For management purposes, the two units were divided at the South Atlantic and Gulf of Mexico Council boundaries. South Atlantic gag grouper were last assessed in 1997 and Gulf of Mexico gag grouper in 2001. This was the first time that either stock was assessed under the SEDAR process. The Review Workshop was the third meeting in the SEDAR10 process. A Data Workshop was held January 23 to 27, 2006 and an Assessment Workshop was held May 1 to 5, 2006. Although these two workshops worked concurrently on both stocks, separate teams assessed each stock.

2) South Atlantic gag grouper

1) Evaluate the adequacy, appropriateness, and application of data used in the assessment.

Data sources included recorded landings from commercial handline and diving, and recreational headboat and the marine recreational fisheries statistical survey (MRFSS). Samples of annual size and age compositions were also available. Three fishery dependent abundance indices were developed, one from the NMFS head boat survey, one from the commercial logbook program, and one from the MRFSS survey. There were no usable fishery independent abundance indices.

The Review Panel raised serious concerns regarding high variability and lack of age and length compositions with the MRFSS data. The Panel concluded that any potential MRFSS inaccuracy has the potential to change the stock status if the problem is consistent. If the inaccuracy is not consistent over time, then it is impossible to know the impacts. Given the lack of evidence of a consistent

and persistent bias in the MRFSS data, the decision was made to use the original data.

The Review Panel discussed the relationship of technology to catchability and the effects of catchability changes on fishery-dependent abundance indices. This was important for this assessment because it relies on fishery-dependent catch rate abundance indices, which divide catch by effort. When a unit of effort becomes more efficient at catching fish, the resulting abundance index becomes biased, making fish appear relatively more abundant. In contrast, fishery-independent indices are on standardized methods to control fishing efficiency over time and are not subject to this problem. No fishery-independent indices were available for this assessment. The Review Panel noted this as an area of concern.

South Atlantic and Gulf of Mexico gag grouper were assessed as two separate stocks. The Review Panel noted that some movement occurred from the South Atlantic to the Gulf. The Florida Keys also represented an area of overlap. The Review Panel accepted the current stock definition but recommended a further examination of stock structure before the next assessment, including a detailed analysis of existing tagging data and the initiation of new tagging experiments.

Overall, The Review Panel deemed that the data were adequate and were used appropriately in the assessment subject to concerns regarding lack of systematic age and length sampling, no fishery independent indices and highly variable MFRSS.

2) Evaluate the adequacy, appropriateness, and applications of methods used to assess the stock.

Two models were used to assess the stock. A statistical catch-at-age model was used as the primary assessment model and an age-aggregated production model was used to investigate results under different model assumptions. Various configurations and sensitivity runs were explored to examine potential changes in catchability. Virtual population analysis (VPA) was not possible as catch at age is not available for every year.

Management benchmarks for the stock are based on the estimated stock-recruitment model. The Review Panel had extensive discussions on the stock-recruit models and residuals. Examination of the stock-recruit plot indicated a negative slope in the stock-recruit relationship with two time periods, before and after the mid 1980s. The Review Panel suggested incorporating environmental information into the analysis and recommended further investigation in the future assessment.

In the assessment, the parameters of the Beverton-Holt stock-recruit model were estimated within the assessment model. Concern was raised that no model fits were made for an alternate Ricker stock-recruit model. These comparisons were provided and it indicated that the Ricker model provided a statistically better fit to the stock-recruit data than the Beverton-Holt model. However, the Review Panel concluded that the Ricker relationship may not be appropriate for gag grouper as there is no apparent mechanism to cause recruitment to be lower at higher spawning stock biomass. It noted that the Beverton-Holt model essentially fitted geometric mean recruitment over the range of observed spawning stock biomasses and recommended that this model be investigated further for the next assessment.

To better understand the behavior of the assessment model to the input data series, the Review Panel requested sensitivity model runs with certain data removed from the model fitting. Additional model runs were examined removing each index, each fishery age composition data set, and each fishery length composition data set one at a time. The results from this analysis suggested that the model is a balanced fit to all the data sources, illustrated by the base run falling within the middle of this set of sensitivity runs.

The Review Panel concluded that the assessment methods were appropriate for the available data and that the methods for standardization of the catch and effort data were appropriate and applied properly.

3) Recommend appropriate estimates of stock abundance, biomass, and exploitation.

The Review Panel evaluated the original assessment results and requested several sensitivity runs. After evaluating these runs, a consensus was reached for a preferred "base model" for the assessment. Details regarding the base model are to be provided in an addendum to the Assessment Report, prepared by the assessment team. Details for the appropriate estimate of stock abundance, biomass and exploitation are listed in the Advisory Report and the addendum to the Assessment Report.

4) Evaluate the methods used to estimate population benchmarks and management parameters (e.g., MSY, F_{msy}, B_{msy}, MSST, MFMT, or their proxies); provide values for management benchmarks, range of ABC, and declarations of stock status.

The methods to estimate population benchmarks and management parameters were based on the Beverton-Holt stock-recruit model estimated externally from the catch at age model with the Review Panel's preferred "base model". The Sustainable Fisheries Act (SFA) and management criteria recommendations and values were estimated from the Panel's preferred base model.

For South Atlantic gag grouper, current rates of exploitation indicate that overfishing is occurring. Relative to the current value of MSST, specified in the FMP, this stock is approaching an overfished condition and is projected to fall below the MSST in 2007. Relative to the MSST proposed by the Review Workshop, the stock is not overfished and is not projected to become overfished under any of the proposed projection scenarios. The Review Panel concluded that the current definition of MSST may be overly conservative and recommended an operational definition of MSST = 5 million pounds. It also cautioned SEDAR and management agencies to be aware of the high degree of uncertainties with the assessment.

5) Evaluate the adequacy, appropriateness, and application of the methods used to project future population status; recommend appropriate estimates of future stock condition.

Projections for the stock were based on the Review Panel's recommended "base model". Estimates of recruitment in 2002-2004 are below average and fishing mortality rates in 2002-2004 are above the MSY level. As a result, the stock projections suggest that the stock will decline below MSST in 2007 (based upon the current value of MSST, specified in the FMP).

The Review Panel noted that the methods are not adequate for forecasting the effects of management measures that involve changing selection patterns, such as changes to minimum landing sizes and bag limits, but are adequate for exploring the information content and management implications of small and incomplete data sets such as that available in this assessment. The Panel again cautioned SEDAR and the Councils to be aware of the high uncertainty attached to this projection.

6) Ensure that stock assessment results are clearly and accurately presented in the Stock Assessment Report and that reported results are consistent with Review Panel recommendations.

The Review Panel recommended a preferred "base model" for this stock, assuming constant catchability. Alternative configurations for the base model were listed in the Stock Assessment Report. Changes requested by the Review Panel are to be incorporated in an addendum to the Assessment Report. The Panel has no way to ensure that such changes are incorporated in the addendum.

7) Evaluate the performance of the Data and Assessment Workshops with regard to their respective Terms of Reference; state whether or not the Terms of Reference for those previous workshops were met and are adequately addressed in the Stock Assessment Report.

The Review Panel evaluated the terms of reference of both the Data and Assessment workshops and concluded that they were adequately met and addressed in the Stock Assessment Report.

8) Review research recommendations provided by the Data and Assessment workshops and make any additional recommendations warranted.

The Panel agreed that catchability has changed over time; however, it did not believe that a constant 2% increase per year adequately described the changes in catchability that likely has occurred. Step changes with the introduction of new equipment or management measures are more likely than monotonic changes. Learning and technological changes in navigation, fish detection and catching equipment have no doubt increased the efficiency of nominal fishing effort. However, management measures (increases in minimum size, time and area closures, bag limits) and changes in fishing behaviour (moving on when "enough" fish have been caught) would be expected to result in decreased catchability. The Panel believed that, overall, catchability is likely to have increased. It recommended that a special workshop be convened to estimate and quantify changes in catchability over the last 25 to 30 years.

The Review Panel recommended a strengthening of the MRFSS program for more precise estimations of age/length compositions.

Provision of more detailed model diagnostics, such as complete lists of estimated parameters together with their estimated standard errors would be beneficial as they are important in the investigation of model sensitivity runs.

Model residuals diagnostics should be explored to test time series autocorrelation for lack of goodness of fit.

The Review Panel recommended an analysis of existing tagging data for movement within/between the two gag stocks. It also recommended the initialization and implementation of new tagging experiments, to estimate mixing rates and associated fishing mortality independent of the commercial fishing.

9) Prepare a Peer Review Consensus Summary summarizing the Panel's evaluation of the stock assessment and addressing each Term of Reference. Prepare an Advisory Report summarizing key assessment results. (Reports to be drafted by the Panel during the review workshop with a final report due two weeks after the workshop ends.)

First drafts of the Consensus Summary and Advisory Report were completed during the Review Workshop. All Review Panel members contributed to the Consensus Report. The assessment team completed the first draft of the Advisory Report, which was then reviewed by the Review Panel. The

Consensus Report and Advisory Report were completed by the Review Panel by email subsequent to the Review Workshop.

3) Gulf of Mexico gag grouper

1) Evaluate the adequacy, appropriateness, and application of data used in the assessment.

The Data Workshop categorized available information under four headings: 1) life history, 2) commercial fishery, 3) recreational fishery, and 4) abundance indices. Life history information included: estimates of total, natural and release mortality, age data, growth, reproduction, movements and migration, stock definition, and meristic conversions. Commercial fishery information included: landings, discards, and biological sampling. Recreational fishery information included: landings, discards, total catches, and length frequency distributions. There were six abundance indices, four of which were fishery dependent and two that were fishery independent.

Size-depth release mortality estimates were used in the assessment, rather than a fixed proportion as used in the previous assessment. The Review Panel noted that although there were not a lot of data, information was consistent between the South Atlantic and Gulf of Mexico.

As growth models can be influenced by size-biased samples due, for example, to minimum size limits, the Data Workshop calculated a modified von Bertalanffy growth model accounting for size limited data. The new growth model, in combination with new age length keys, resulted in a substantial change in catch in age between the current and previous assessment. There were fewer fish aged 1 to 3 and more fish aged 4 and older; this resulted in an overall lower number of fish caught in the current assessment. The Review Panel noted that discards far exceeded landings in the recreational fishery since 1990, suggesting that management measures regarding minimum sizes may not have had as large an effect as anticipated. Catch at age, which includes mostly discards, has increased substantially with the implementation of these measures in the 1990s.

The Data and Assessment Working Groups concluded that analyses of recoveries from tagging studies were inconclusive and that council boundaries should rule as the dividing line for the two stocks. The Review Panel noted that some movement occurred from the South Atlantic to the Gulf. It accepted the current stock definition but recommended a further examination of stock structure before the next assessment, including a detailed analysis of existing tagging data and the initiation of new tagging experiments.

In anticipation that a statistical age-structured model would be used in this assessment, the Data Workshop tabulated commercial landings for 1963 to

2004. The previous stock assessment used landings starting in 1986. They also examined issues concerning stock boundaries, the misidentification of gag as black grouper, and the adjustment of gag landings to include a portion of unclassified grouper species, primarily prior to the mid-1980s. The proportions of gag and black grouper from 1986 to 1989 were used to calculate the amount of unclassified groupers from 1963 to 1985. This time period was used as size limits had not yet been imposed and it was thought that these proportions would best reflect the historical time period. The Review Panel accepted this method, noting however that it introduced a further source of uncertainty in historical commercial landings.

Two series of recreational catches and discards from 1963 to 2004 were generated by the Data Workshop, one based upon a correlation with commercial catches and one based upon a linear increase from 1945. The Assessment Workshop rejected the historical recreational time series and recommended an alternative approach using a relationship between the MRFSS fishing effort and the number of boats built between 1981 and 2004. The issue of extending recreational (and commercial) catches back through time generated considerable debate among the Review Panel. Concerns were expressed regarding the accuracy of such catches and the impact they may have within the assessment model. However, it was concluded that although historical catches may not be accurate, they do provide valuable information and should be included in the assessment.

Four fishery dependent indices (commercial handline, commercial longline, headboat survey, and MRFSS) and two independent indices (SEAMAP video survey, and Florida Estuaries Index) were used in the assessment. There was a limited discussion by the Review Panel regarding the abundance indices. A question was raised regarding the spatial coverage of the fishery independent indices. The Review Panel concurred with the inclusion of the six indices in the assessment model.

The Review Panel concluded that the Data and Assessment Workshops explored a full range of available data sources and selected those that were most appropriate and scientifically sound for the assessment. The data were considered to be adequate, although the Review Panel did concur with the observations of the Data and Assessment Workshops regarding the limited availability of biological sampling data (lengths and ages) prior to the 1980's. The Review Panel concluded that the data selected by the Assessment Workshop were applied appropriately in the assessment.

2) Evaluate the adequacy, appropriateness, and applications of methods used to assess the stock.

A statistical age-structured forward reconstruction model (CASAL) was used as the primary method for the assessment. Additionally the assessment

model used in the 2001 assessment (VPA, virtual population analysis) was run to show the effects of updated data and the effects of adding indices of abundance not available in 2001.

Six CASAL model runs were provided. Two time series were considered in the first two runs, one with commercial and recreational catches from 1963 to 2004, and a second with commercial catches from 1880 to 2004 and recreational catches from 1945 to 2004. In the next two model runs, one assumed constant catchability and the second assumed a 2% annual increase since 1984. In the final two runs, the MRFSS total estimated catch was increased by 25% for the entire time series in one run, and it was decreased by 25% in the other. From these, the Assessment Workshop presented two as base case scenarios for estimation of benchmarks and stock status, one with commercial and recreational catches from 1963 to 2004, assuming constant catchability, and the second with the same catch series, assuming 2% annual increase in catchability. After considerable discussion, the Review Panel concluded that catchability has changed over time. However, it did not believe that a constant 2% increase per year adequately described the change in catchability that is likely to have occurred. Step changes with the introduction of new equipment or management measures are more likely than monotonic changes. Learning and technological changes in navigation, fish detection, and fishing gear have no doubt increased the efficiency of nominal fishing effort. However, management measures (increases in minimum size, time and area closures, bag limits) and changes in fishing behaviour (moving on when enough fish have been caught) would likely result in decreased catchability. The Review Panel believed that, overall, catchability is likely to have increased and recommended that a special workshop be convened to estimate and quantify changes in catchability over the last 25 to 30 years.

The base case CASAL model run included commercial and recreational catches from 1963 to 2004. The Review Panel expressed concerns regarding the back calculation of catch data and asked the assessment team to provide a CASAL run with actual catch data only (1986 to 2004). The assessment team was also asked to provide the results of two VPA runs for comparison with the CASAL model. The results indicated similar trends in stock size and fishing mortality estimates with higher biomass and lower fishing mortalities for the shorter time series.

A Beverton-Holt stock recruitment relationship was assumed in all CASAL model runs. Examination of stock recruit scatter plots indicated that recruitment is not strongly linked to SSB. Given the variability in the stock recruit data, the Review Panel requested further evaluation using Ricker and ‘hockey stick’ stock recruitment relationships. The assessment team provided these comparisons during the Review Workshop; the Beverton-Holt and Ricker curves were virtually identical through the range of data. However, both the Beverton-Holt and Ricker relationships suggested that considerably higher recruitment would result from

larger SSBs, and B_{MSY} is estimated to be higher than SSBs observed in the past. It was noted that the Assessment Workshop preferred the Beverton-Holt relationship over the Ricker. However, the Review Workshop concluded that both might over estimate virgin recruitment and thus MSY and SSB_{MSY}. It indicated that more stock and recruitment observations are necessary to confirm that the benchmarks estimated in the current assessment are indeed attainable.

The Review Panel generally endorsed the method used in the assessment and considered it to be scientifically sound. The Panel did, however, have concerns regarding the choice of a Beverton-Holt stock recruit function and recommended that a Ricker function be used to examine the sensitivity of the model to the two stock recruitment functions. The Panel was impressed with the number of alternative runs provided by the Assessment Workshop and the thorough presentation regarding model inputs and results presented by the assessment team at the Review Workshop.

3) Recommend appropriate estimates of stock abundance, biomass, and exploitation.

The Review Panel evaluated the various assessment runs provided by the Assessment Workshop. It agreed upon a base run as reported above; the base run is to be described in the addendum to the assessment report. The accepted estimates of stock abundance, biomass, and exploitation are provided in the Advisory Report.

4) Evaluate the methods used to estimate population benchmarks and management parameters (e.g., MSY, F_{msy}, B_{msy}, MSST, MFMT, or their proxies); provide values for management benchmarks, range of ABC, and declarations of stock status.

The stock and recruitment scatter plots suggested that recruitment is not strongly linked with SSB. Both the Beverton-Holt and Ricker relationships suggested that considerably higher recruitment would result from larger SSBs, and that B_{MSY} is estimated to be higher than SSBs observed in the past. The Review Workshop considered that the stock recruitment relationship is uncertain and that more stock and recruitment observations are necessary to confirm that the benchmarks, estimated in the current assessment are indeed attainable.

MSST, defined as (1-M)* B_{MSY}, would be very close to B_{MSY} because an M = 0.14 is used. Given the uncertainties in the assessment, the biomass would be expected to be estimated to fall below MSST with a relatively high frequency even if in fact the real biomass was close to B_{MSY}. There are indications that recruitment could become impaired below 20 million lbs and the Review Workshop suggested that MSST could be set at 20 million lbs as an operational definition, to be re-examined at the next assessment.

The numerical value for the MFMT ($F_{30\%SPR}$ (F_{MSY} Proxy)) estimated in the current assessment (0.17) is not consistent with the dynamics of gag grouper. The Review Panel could not provide advice on target F and biomass reference points, but noted that the stock has apparently increased as a result of good recruitment under estimated fishing mortality rates that have fluctuated around an average value of F = 0.30 since the early 1980s. The Review Panel advised that it would be prudent management to reduce fishing mortality below F = 0.30.

5) Evaluate the adequacy, appropriateness, and application of the methods used to project future population status; recommend appropriate estimates of future stock condition.

Projections were not available during the Review Workshop and were to be provided to the Review Panel by the assessment team subsequent to the meeting. These projections were still not available by the deadline (July 14, 2006) for the submission of this report. Consequently, this term of reference could not be evaluated.

6) Ensure that stock assessment results are clearly and accurately presented in the Stock Assessment Report and that reported results are consistent with Review Panel recommendations.

Initial stock assessment results were clearly and accurately presented in the report of the Assessment Workshop (SEDAR10-SAR2-Section III). Additional analyses requested by the Review Panel will be incorporated as an addendum to the stock assessment report. The Panel has no way to ensure that such changes are incorporated in the addendum.

7) Evaluate the performance of the Data and Assessment Workshops with regard to their respective Terms of Reference; state whether or not the Terms of Reference for those previous workshops were met and are adequately addressed in the Stock Assessment Report.

The Review Panel agreed that the terms of reference of the Data and Assessment Workshops were met and were adequately addressed in the Stock Assessment Report.

8) Review research recommendations provided by the Data and Assessment workshops and make any additional recommendations warranted.

The Review Panel concurred with the following recommendations from the Data Workshop. There were no research recommendations in the Assessment Workshop report.

Recommendations from Data Workshop:

1. Increase sampling for otoliths for aging from commercial fishery.

2. Improve at sea observations for discards from commercial fishery.
3. Develop a suitable method to correct species misidentification between black and gag grouper on a trip by trip basis. This issue will be of particular concern when assessing black grouper. The catches of gag grouper misidentified as black is likely a substantial proportion of reported black grouper landings.
4. We recognize that many valuable and well designed fisheries-independent sampling programs have been under funded or discontinuously funded, resulting in low sample sizes, variable sampling effort (in time and space), discontinuous series, and poorly stratified designs. The group strongly recommends increased funding toward developing and maintaining fishery-independent sampling programs, and stresses that quality indices require continuous funding over meaningful time periods (ideally decades).
5. It was proposed that the index working group examine the possibility of including environmental variables in computation of indices. Variable discussed included wave height, sea surface temperature, surface currents and hurricane impact. The group recommended that, when possible, environmental factors should be considered in future standardization procedures. The group also recognized that other model parameters, particularly the spawner-recruit relationship might be directly influenced by environmental variables, and recommended further consideration of this topic.
6. The group recognized the need to quantify changes in catchability over time. Many stock assessments use catch-per-unit-effort (CPUE) data under the assumption that there is a linear relationship between CPUE and abundance. Indeed, much of the work done to ‘standardize’ catch rates represent adjustments designed to account for nonlinear behavior of catch rates relative to resource abundance. However, there could be features in the data that could not be adjusted for by these standardization procedures due to lack of detail. For instance, an un-quantified systematic increase in efficiency over time could, in a fishery in which there is a declining stock, underestimate the rate of decline, leading to a condition termed hyperstability in the abundance index. On the other hand, there could also be tendencies over time wherein targeting shifts away from the resource leading to a hyperdepletion in the index relative to resource abundance.
7. Recommendation: To address these concerns, the SEDAR10 index of abundance working group and the DW plenary recommend the use of an assessment model structure that can accommodate a nonlinear (for example, power-law) relationship between CPUE indices and stock size. Yet we recognize that there is likely to be insufficient information to estimate such a nonlinear relationship since at least one additional parameter must be estimated per abundance index (wherein some non-linearity is hypothesized to occur). Therefore, we recommend that

sensitivity analyses that fix the nonlinear parameter(s) at plausible values be conducted to show implications of such assumptions.

The Review Panel provided the following Research Recommendations:

1. The Review Panel noted the importance of age reading comparisons and recommended that exchange of otoliths between labs continue in the future.
2. The Review Panel recommended a further examination of stock structure before the next assessment, including a detailed analysis of existing tagging data and the initiation of new tagging experiments.
3. The Review Panel believes that, overall, catchability in the commercial and recreational fisheries is likely to have increased over time and recommends that a special workshop be convened to estimate and quantify changes in catchability over the last 25 to 30 years.

9) Prepare a Peer Review Consensus Summary summarizing the Panel's evaluation of the stock assessment and addressing each Term of Reference. Prepare an Advisory Report summarizing key assessment results. (Reports to be drafted by the Panel during the review workshop with a final report due two weeks after the workshop ends.)

First drafts of the Consensus Summary and Advisory Report were completed during the Review Workshop. All Review Panel members contributed to the Consensus Report. The assessment team completed the first draft of the Advisory Report, which was then reviewed by the Review Panel. The Consensus Report and Advisory Report were completed by email subsequent to the Review Workshop.

Perceptions of SEDAR10

Although not stated in the Consensus Summaries, I am of the opinion that changes and corrections to the presented assessments, for both stocks, did not constitute alternate assessments. The presented assessments, with modifications requested by the Review Panel, were deemed to be scientifically acceptable.

This is the second SEDAR Review Panel on which I have been asked to participate, the first being SEDAR6. Substantial improvements have been made to the SEDAR process in the intervening period. The three level approach (Data, Assessment and Review workshops) is designed to ensure that all facets of the assessment are reviewed at separate stages by a broad spectrum of scientific experts. The Data and Assessment workshops also ensure that the most appropriate data and assessment methods have been used prior to the final Review workshop. In SEDAR6, the three stage process was not followed; in

SEDAR10, it was and provided for a more thorough review of the assessed stocks.

The SEDAR process has become more structured and is very well organized. However, like the SAW process, the SEDAR Review Workshop is now reliant solely upon panellists provided by the Center for Independent Experts. In my opinion, this poses some concerns. Under the former model (eg: SEDAR6), the Review Panel consisted of scientific experts from the CIE, from the NMFS, and from academia. This provided for a broader expertise in the review process. The current model is designed to assess scientific credibility only and not to provide management advice. This is a positive step as it provides a buffer between the science of stock assessment and the potential politics of management. This buffer or barrier should be maintained and the revised model attempts to address this. However, the assessment of scientific credibility should not preclude additional panellists besides those provided by the CIE.

In SEDAR10, concurrent Data and Assessment workshops were held for South Atlantic and Gulf of Mexico gag grouper. In my opinion, data sources were evaluated thoroughly to ensure that the most appropriate and applicable data were used in the assessments. The assessment of each of the stocks was then conducted by separate teams, using similar but somewhat different assessment models. It was therefore more difficult for the Review Panel to make direct comparisons between assessment results. Recognizing that this was the first time that either of these stocks was assessed under the SEDAR process, the assessment teams did an excellent job. However, in future, a more thorough review could be facilitated if the assessment teams worked cooperatively using a single model for both stocks.

Both assessment teams worked diligently during the Review Workshop to provide additional analyses requested by the Review Panel. However, projections for Gulf of Mexico gag grouper could not be completed and were to be forwarded to the Review Panel subsequent to the conclusion of the meeting. These were still not available by the deadline of this report (July 14, 2006). Consequently, one of the terms of reference (#5) could not be evaluated. This also caused a delay in the completion of the Consensus Summary and Advisory Report beyond the contract deadline specified by the CIE, illustrating the importance of completion of these documents during the Review Workshop.

Appendix 1. List of References Provided

Document #	Title	Authors
Documents Reviewed at the Data Workshop		
SEDAR10-DW1	Metadata for gag tagging data	McGovern, J., P. Harris
SEDAR10-DW2	Age, Length, and Growth of Gag from the NE Gulf of Mexico 1979-2005	Lombardi-Carlson, L. A., G. R. Fitzhugh, B. A. Fable, M. Ortiz, C. Gardner
SEDAR10-DW3	Update of gag reproductive parameters: Eastern Gulf of Mexico	Fitzhugh, G. R., H. M. Lyon, L. A. Collins, W. T. Walling, L. Lombardi Carlson
SEDAR10-DW4	Standardized Catch Rates of Gag from the United States headboat fishery in the Gulf of Mexico during 1986-2004	Brown, C. A.
SEDAR10-DW5	Description of MARMAP sampling program	Harris, P.
SEDAR10-DW6	Analysis of Preliminary Results for the Release of Satellite-Tracked Drifters over Gag Spawning Sites	Lesher, A. T., G. R. Sedberry
SEDAR10-DW7	Preliminary Notes on FL Gag Data and Trip Ticket Map	Brown, S.
SEDAR10-DW8	Review of Tagging Data for gag grouper from the Southeastern Gulf of Mexico region 1985-2005	Ortiz, M. K. Burns, J. Sprinkel
SEDAR10-DW9	Standardized catch rates for gag grouper from the MRFSS	Ortiz, M.
SEDAR10-DW10	Standardized catch rates for gag grouper from the United States Gulf of Mexico handline fishery during 1993-2004	McCarthy, K. J.
SEDAR10-DW11	Estimates of gag grouper discard by vessels with Federal Permits in the Gulf of Mexico	McCarthy, K. J.
SEDAR10-DW12	NOAA Fisheries Reef Fish Video Surveys: Yearly indices of abundance for Gag	Gledhill, C. T., G. W, Ingram, K. R. Rademacher, P. Felts, B. Trigg.
SEDAR10-DW-13	Report of a gag age workshop	Reichert, M., G. Fitzhugh, J. Potts

SEDAR10-DW-14	QA/QC procedures used for TIP online data	Gloeckner, D.
SEDAR10-DW-15	Analytical report on the age, growth, and reproductive biology of gag from the Southeastern United States	Reichert, M. , D. Wyanski
SEDAR10-DW-16	Gag history of management in the Gulf of Mexico	Rueter, J.
SEDAR10-DW-17	Overview of gag material in Draft SAFMC Snapper-Grouper Amendment 13B	Waugh, G.
SEDAR10-DW-18	Standardized catch rate indices for gag grouper landed by the US Gulf of Mexico longline fishery during 1993-2004	Cass-Calay, S. L.
SEDAR10-DW-19	Standardized catch rates of gag from the commercial handline fishery off the Southeastern United States	Shertzer, K.
SEDAR10-DW-20	Standardized catch rates of gag from the headboat fishery off the Southeastern United States	Cheshire, R., K. Shertzer
SEDAR10-DW-21	Recreational landings and length data summary for South Atlantic gag (DELETED FOLLOWING WORKSHOP DUE TO INCLUSION OF CONFIDENTIAL DATA)	Cheshire, R, and D. Vaughan
SEDAR10-DW-22	Commercial landings and length data summary for South Atlantic gag. (DELETED FOLLOWING WORKSHOP DUE TO INCLUSION OF CONFIDENTIAL DATA	Gloeckner, D., D. Vaughan
SEDAR10-DW-23	Effect of some variations in sampling practices on the length frequency distribution of gag groupers caught by commercial fisheries in the Gulf of Mexico	Chih, C-P
SEDAR10-DW-24	Estimation of species misidentification in the commercial landing data of gag groupers and black groupers in the Gulf of Mexico	Chih, C-P., S. Turner

SEDAR10-DW-25	Habitat use by juvenile gag in subtropical Charlotte Harbor, FL.	Casey, J. P., G. R. Poulakis, P. W. Stevens
SEDAR10-DW-26	Recreational survey data for gag and black grouper in the Gulf of Mexico.	Phares, P., V. Matter, S. Turner
SEDAR10-DW-27	Spatial distribution of headboat trips from the Florida Keys	Matter, V. M.
SEDAR10-DW-28	Species ID south atlantic – ETA 1 week post workshop	Chih
SEDAR10-DW-29	Council Boundaries	anon
SEDAR10-DW-30	Annual indices of abundance for gag from Florida Estuaries	Igram, W., T. Macdonald, L. Barbieri
SEDAR10-DW-31	Age composition information South Atlantic	Potts, J.
Assessment Workshop Documents		
SEDAR10-AW1	SEDAR 10 stock assessment model, US South Atlantic gag	Williams, Erik H.
SEDAR10-AW2	Preliminary status of gag grouper in the Gulf of Mexico: continuity run VPA, SEDAR 10	Ortiz, M.
SEDAR10-AW3	Preliminary status of gag grouper in the Gulf of Mexico, SEDAR 10	Ortiz, M.
Review Workshop Documents		
SEDAR10-RW01	Virtual population analysis of the Gulf of Mexico gag grouper stock: the continuity case.	Sladek-Nowlis, J.
SEDAR10-RW02	Status review of gag grouper in the US Gulf of Mexico, SEDAR 10.	Ortiz, M
Final SEDAR Reports		
SEDAR10-SAR1	South Atlantic Gag Grouper SEDAR Assessment Report	
SEDASR10-SAR2	Gulf of Mexico Gag Grouper SEDAR Assessment Report	
Research Documents		
SEDAR10-RD01	Exegeses on Linear Models	Venables, W.N.
SEDAR10-RD02 1977	A reformulation of Linear Models J. Royal Stat. Soc. A 140(1):48-77	Nelder, J. A.

SEDAR10-RD03 1999	Stock identification of gag along the Southeast coast of the United States Mar. Biotechnol. 1, 137-146.	Chapman, R. W., Sedberry, G. R. , C. C. Koenig, B. M. Eleby
SEDAR10-RD04 2005	A tag and recapture study of gag off the Southeastern US Bull Mar Sci 76(1)47-59.	McGovern, J. C.,et al
SEDAR10-RD05 1983	Empirical use of longevity data to estimate mortality rates FishBull 82(1)898-903	Hoenig, J.M.
SEDAR10-RD06 2005	Bycatch, discard composition, and fate in the snapper grouper commercial fishery, North Carolina NCSU/CMAST Proj 04-FEG-08	Rudershaussen, P. J., A. Ng, A. Ng, J. A. Buckel
SEDAR10-RD07 2007	CASAL users manual version 2.07-2005/08/21 NIWA Tech Rpt.127. ISSN 1174-2631	Bull, B. et al
SEDAR10-RD08 1994	Simulation of the impact of fishing on reproduction of a protogynous grouper, the graysby. NAJFM 14:41-52	Huntsman, G. R. and W. E. Schaaf.
SEDAR10-RD09	Review of effects from fishing mortality on protogynous species and implications for management	SEFSC/MIA SFD Presentation
SEDAR10-RD10 2006	Models to compare management options for a protogynous fish. Ecolog. Apps. 16(1):238-249	Heppell, S. S. et al
SEDAR10-RD11 2004	The effects of size-selective fisheries on the stock dynamics of and sperm limitation in sex changing stocks. Fish Bull 102(1):1-13.	Alonzo, S. H., M. Mangel.
SEDAR10-RD12 2001	Effects of fishing on a protogynous hermaphrodite CJFAS. 58:568-578.	Armsworth, P. R.
SEDAR10-RD14 1998	The impact of global positioning systems and plotters on fishing power in the northern prawn fishery, Australia Can. J. Fish. Aquat. Sci. 55: 1645.1651	Robins, C. M., Y.-G. Wang, D. Die

SEDAR10-RD15 1998	Changes in the sex ratio and size at maturity of gag, Mycteroperca microlepis, from the Atlantic Coast of the Southeastern United States, 1976-1995 Fish Bull 96:797-807	McGovern et al.
SEDAR10-RD16	Release mortality of undersized fish from the snapper-grouper complex off the North Carolina Coast. NC SEAGRANT 03-FEG-21	Overton, A. S., J. Zabawski

Appendix 2. Statement of Work

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 and advisory 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 SEDAR website. 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. 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, correction of errors, and sensitivity runs of the assessment model provided by the assessment workshop. 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 10 review panel will be composed of 3 CIE-appointed reviewers 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.

CIE Request:

NMFS-SEFSC requests the assistance of three fisheries assessment scientists from the CIE to serve as technical reviewers for the SEDAR 10 review panel that will consider assessments for Gulf of Mexico gag grouper and South Atlantic gag grouper. Reviewer tasks are listed below.

The species assessed through SEDAR 10 are within the jurisdiction of the Gulf of Mexico Fishery Management Council, the South Atlantic Fishery Management Council, and respective southeastern states.

The review workshop will take place at the Doubletree Buckhead Atlanta, from 1:00 p.m. Monday, June 26, 2006 through 1:00 p.m. Friday, June 30, 2006.

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 documents.

Please contact John Carmichael (SEDAR Coordinator; 843-571-4366 or John.Carmichael@safmc.net) for additional details.

Hotel arrangements:

Doubletree Buckhead
3342 Peachtree Road NE
Atlanta, GA 30326
(800) 222-8733; (404) 231-1234
FAX (404) 231-5236

Group Rate $115 + 15% tax ($17.25) = $132.25; guaranteed through Monday, June 5, 2006.

SEDAR Review Workshop Panel Tasks:

The SEDAR 10 Review Workshop Panel will evaluate assessments of Gulf of Mexico and South Atlantic gag grouper. During the evaluation the panel will consider input data, assessment methods, and model results. The evaluation will be guided by Terms of Reference that are specified in advance. For each species assessed the Review Workshop panel will document its findings in a Peer Review Consensus Summary and summarize assessment results in a Peer Review Advisory Report.

SEDAR 10 Review Workshop Terms of Reference (apply to each assessment):

1. Evaluate the adequacy, appropriateness, and application of data used in the assessment.
2. Evaluate the adequacy, appropriateness, and application of methods used to assess the stock.
3. Recommend appropriate estimates of stock abundance, biomass, and exploitation.
4. Evaluate the methods used to estimate population benchmarks and management parameters (*e.g., MSY, Fmsy, Bmsy, MSST, MFMT, or their proxies*); provide values for management benchmarks, a range of ABC, and declarations of stock status.
5. Evaluate the adequacy, appropriateness, and application of the methods used to project future population status; recommend appropriate estimates of future stock condition.
6. Ensure that reported results are consistent with Review Panel recommendations.
7. Evaluate the SEDAR Process. Review performance of the Data and Assessment Workshops with regard to their respective Terms of Reference; state whether or not the Terms of Reference for those previous workshops were met and are adequately addressed in the Stock Assessment Report; suggest any changes or improvements to the process.
8. Review research recommendations provided by the Data and Assessment workshops and make any additional recommendations warranted.
9. Prepare a Peer Review Consensus Summary for each assessment summarizing the Panel's evaluation of the stock assessment and addressing each Term of Reference. Prepare an Advisory Report for each assessment summarizing key assessment results. (Reports to be drafted by the Panel during the review workshop. Final drafts are due to the Chair within 2 weeks (July 14, 2006). Final reports are due to the SEDAR Coordinator one week later (July 21, 2006).

NOTE: These Terms of Reference may be modified prior to the Review Workshop. 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 conducting the meeting during the workshop in an orderly fashion. The Chair is responsible for compiling and editing the Peer Review Consensus Summary and Peer Review Advisory Report for each species assessed and submitting them to the SEDAR Coordinator by a deadline specified by the SEDAR Steering Committee.

Review panel reviewers are responsible for reviewing documents prior to the workshop, participating in workshop discussions addressing the terms of reference, preparing assessment summaries and consensus reports during the workshop, and finalizing workshop 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 1.

The Chair and SEDAR Coordinator will appoint one panelist to serve as assessment leader for each assessment reviewed. The leader will be responsible for providing an initial

draft of consensus and advisory report text for consideration by the panel. However, as stated above, all panelists are expected to participate in preparation of report text.

The Review Panel's primary responsibility is to ensure that assessment results are based on sound science, appropriate methods, and appropriate data. During the course of review, the panel is allowed limited flexibility to deviate from the assessment provided by the Assessment Workshop. This flexibility may include modifying the assessment configuration and assumptions, requesting a reasonable number of sensitivity runs, requesting additional details and results of the existing assessments, or 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 technical staff present to determine which requests can be accomplished and 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 agree to a process for reviewing the final results.

The review panel should not provide specific management advice. Such advice will be provided by existing Council Committees, such as the Science and Statistical Committee and Advisory Panels, following completion of the assessment.

If the Review Panel finds an assessment deficient to the extent that technical staff present cannot correct 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.

Statement of Tasks for Technical Reviewers:

Roles and responsibilities:

1. Approximately 3 weeks prior to the meeting the CIE reviewers shall be provided with the stock assessment reports, associated supporting documents, and review workshop instructions including the Terms of Reference. Reviewers shall read these documents to gain an in-depth understanding of the stock assessment, the resources and information considered in the assessment, and their responsibilities as reviewers.
2. During the Review Panel meeting, the reviewers shall participate in panel discussions on assessment methods, data, validity, results, recommendations, and conclusions as guided by the Terms of Reference. The reviewers also shall participate in the development of Peer Review Consensus Summary reports and the Peer Review Advisory Reports. Reviewers may be asked to serve as assessment leaders during the review to facilitate preparing first drafts of review reports.

3. Following the Review Panel meeting, the reviewers shall review and provide comments to the Panel Chair on the Peer Review Panel Reports. Final review panel documents shall be provided to the Chair by July 14, 2006.

4. Following the Review Panel meeting, the reviewers shall each prepare a CIE Reviewer Report. This report shall be submitted to CIE no later than July 14, 2006, 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@rsmas.miami.edu. See Annex I for complete details on the report outline.

   It is estimated that the Review Panelist duties will occupy 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 ensure that final review comments on documents are provided to the Chair and to complete a CIE review report.

Workshop Final Reports:

The SEDAR Coordinator will send copies of the final Review Panel Consensus Report and Advisory Report to Dr. David Sampson and Mr. Manoj Shivlani at the CIE.

CIE Reports:

Once finalized and accepted by the CIE, CIE reviewer reports shall be distributed by the CIE to:

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

SEDAR Coordinator: John Carmichael, SAFMC, One Southpark Circle, Suite 306, Charleston, SC 29407 (email, John.Carmichael@safmc.net)

Gulf of Mexico Fishery Management Council: Wayne Swingle, Executive Director, GMFMC, 2203 N. Lois Avenue, Suite 1100, Tampa, FL 33607 (email (Wayne.Swingle@gulfcouncil.org)

South Atlantic Fishery Management Council: Bob Mahood, Executive Director, SAFMC, One Southpark Circle #306, Charleston SC 29407 (email Bob.Mahood@safmc.net).

For Additional Information or Emergency:

SEDAR contact: John Carmichael, One Southpark Circle, Suite 306, Charleston, SC 29407. Phone: 843-571-4366; cell phone (843) 224-4559. Email: John.Carmichael@safmc.net.

SEDAR Review Workshop Document Contents

Consensus Summary Outline

I. Terms of Reference

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

II. Additional Comments

Provide a summary of any additional discussions not captured in the Terms of Reference statements.

III. Recommendations for Future Workshops

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

Advisory Report Outline

Stock Distribution and Identification

Summary of the unit stock and its geographic distribution.

Assessment Methods

Summary of the assessment method.

Assessment Data

Summary of input data sources.

Catch Trends

Summary of catches by fishery

Fishing Mortality Trends

Summary of fishing mortality estimates

Stock Abundance and Biomass Trends

Summary of abundance, biomass, and recruitment

Status Determination Criteria

Summary of SFA and management criteria.

Stock Status

Declaration of stock status.

Projections

Summary of stock projections.

Special Comments

Additional comments of importance

Sources of Information

Source of results contained in advisory report (i.e., workshop report or addendum)

Tables:

Catch and Status

The Catch and Status table summarizes recent stock and fishery conditions. 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/Fmsy, B/Bmsy). Values will be provided by the analytical team.

Stock Status Criteria

Summary of recommended or mandated benchmarks and estimated values.

FIGURES:

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

ANNEX I: Contents of CIE Reviewer Report

1. The reviewer report shall be prefaced with an executive summary of findings and/or recommendations.

2. The main body of the reviewer report shall consist of a background, description of review activities, summary of findings, and conclusions/recommendations. The summary of findings shall address the workshop Terms of Reference 1- 8 under the above heading “SEDAR Review Workshop Panel Tasks”. Reviewers are also encouraged to provide any criticisms and suggestions for improvement of the SEDAR process.

3. The reviewer report shall include as separate appendices the bibliography of materials provided for review and a copy of the CIE Statement of Work.