CIE Reviewer's Independent Report on the 2010 assessment of black grouper (*Mycteroperca bonaci*) and red grouper (*Epinephelus morio*)

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Prepared for

Center for Independent Experts

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Contents

Executive Summary

The Stock Assessment Review met in Savannah, Georgia, from Monday, January 25, through Friday, January 29, 2010, to review the assessment of black grouper (*Mycteroperca bonaci*) and red grouper (*Epinephelus morio*).

The Review Panel (RP) was composed of three scientists affiliated with the Center for Independent Experts: Dr. Paul Medley, Dr. Stuart Reeves, and Dr. Neil Klaer. Two additional reviewers not affiliated with the CIE were Dr. Gary Grossman and Dr. Sean Powers. The Review Meeting was chaired by Dr. Chris Legault from the Northeast Fisheries Science Center. Staff from SEDAR, Gulf of Mexico Fishery Management Council, South Atlantic Fishery Management Council and National Marine Fisheries Service Miami assisted with the meeting proceedings, and representatives of the assessment teams from NMFS Beaufort and Fish and Wildlife Research Institute presented their results, answered questions and responded to requests from the RP.

The meeting format included presentations mixed with questions and open discussion, and public comments were also accepted. Activities of the reviewers were shared during the meeting.

Findings by term of reference

1. Evaluate the adequacy, appropriateness, and application of data used in the assessment.
    - In general, the input data and methods used to process them for inclusion in the assessment were adequate and appropriate.
    - Improved procedures for documentation and archival of assessment input data could be implemented.
    - There is a need to consider the unit stock for assessment purposes. For black grouper there may be recruitment contributions from regions outside of US control. For red grouper there may be sub-stock structuring.
    - Natural mortality is a major uncertainty. Historical records could be examined for red grouper to potentially reduce this uncertainty.
2. Evaluate the adequacy, appropriateness, and application of methods used to assess the stock.
    - The analytical approach was appropriate and provides an acceptable basis for management advice.
    - Efforts should continue in migrating the red grouper model to Stock Synthesis, and to also consider using SS for black grouper.
    - The base cases for both red and black grouper were modified during the review after examining sensitivity analyses and diagnostics requested by the RP. Results from the modified base runs were to be compiled and made available in the weeks following the review, and at the time of writing are not completed.
3. Recommend appropriate estimates of stock abundance, biomass, and exploitation.
    - The analytical approach was appropriate and provides an acceptable basis for management advice.
4. Evaluate the methods used to estimate population benchmarks and management parameters (e.g., MSY, F_{msy}, B_{msy}, MSST, MFMT, or their proxies); recommend

appropriate management benchmarks and provide estimated values for management benchmarks, a range of ABC, and declarations of stock status. In addition, for black grouper, the Gulf Council requests that the RP evaluate the methods used to estimate OFL.

- The analytical approach was appropriate and provides an acceptable basis for management advice.
- Simulation testing should be used to compare among alternative assessment model structures, and to test the robustness of harvest control strategies to uncertainty. Implementation of a MSE framework for red and black grouper would achieve these goals.

5. 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).
    - The analytical approach was appropriate and provides an acceptable basis for management advice.
6. 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.
    - The analytical approach was appropriate and provides an acceptable basis for management advice.
    - Plausible alternative models should be used to better estimate the true uncertainty in the assessment results.
7. Ensure that stock assessment results are clearly and accurately presented in the Stock Assessment Report, including the Summary Report, and that reported results are consistent with RP recommendations**.
    - A set of standard sensitivity analyses that should accompany any base case was recommended by the RP, and also a set of standard diagnostics that should be presented for the base case and sensitivity analyses.
8. Evaluate the SEDAR Process as applied to the reviewed assessments and identify any Terms of Reference which were inadequately addressed by the Data or Assessment Workshops.
    - The SEDAR process of data workshop, assessment workshop and review workshop for red and black grouper was effective.
    - The TORs of the data and assessment workshops were adequately addressed.
    - There may be advantages and efficiency gains in the SEDAR process being directed at the snapper-grouper complex level, rather than at particular species or sub-groups.
9. Consider the research recommendations provided by the Data and Assessment workshops and make any additional recommendations or prioritizations warranted. Clearly denote research and monitoring needs that could improve the reliability of future assessments. Recommend an appropriate interval for the next assessment, and whether a benchmark or update assessment is warranted.
    - Research priority for both species should be given to improving the discard mortality rate (particularly from the recreational fishery), acquiring improved fishery-independent abundance estimates, improved estimation for recreational catch and improved age and growth data.
    - For black grouper there is a need to quantify linkages between US stocks and other stocks in the GOM in terms of contribution to recruitment.

- For red grouper there is a need to investigate whether there is sub-stock structure in the south Atlantic that needs to be accounted for in the assessment.
- It would be preferable if the priority given to the stock assessment of different species in the snapper-grouper complex was decided based on total value or conservation status or other important management criteria

10. Prepare a Peer Review Summary summarizing the RP's evaluation of the stock assessment and addressing each Term of Reference. Develop a list of tasks to be completed following the workshop. Complete and submit the Summary Report within 3 weeks of workshop conclusion.
    - In progress at the time of writing.

1 Introduction

1.1 Background

The Stock Assessment Review met in Savannah, Georgia, from Monday, January 25, through Friday, January 29, 2010, to review the assessment of black grouper (*Mycteroperca bonaci*) and red grouper (*Epinephelus morio*).

The Review Panel (RP) was composed of three scientists affiliated with the Center for Independent Experts: Dr. Paul Medley, Dr. Stuart Reeves, and Dr. Neil Klaer. Two additional reviewers not affiliated with the CIE were Dr. Gary Grossman and Dr. Sean Powers. The Review Meeting was chaired by Dr. Chris Legault from the Northeast Fisheries Science Center. Staff from SEDAR, Gulf of Mexico Fishery Management Council, South Atlantic Fishery Management Council and National Marine Fisheries Service Miami assisted with the meeting proceedings, and representatives of the assessment teams from NMFS Beaufort and Fish and Wildlife Research Institute presented their results, answered questions and responded to requests from the RP.

Two weeks prior to the review meeting assessment documents and supporting materials were made available to the RP via a secure webserver. During the meeting, all documents were available electronically via the same webserver, and notes and presentations were uploaded as they became available.

The meeting format included presentations mixed with questions and open discussion. The RP participated in the review of each term of reference. The meeting was open to the public and public comments were also accepted.

1.2 Review Activities

A brief description of presentations, RP requests and responses are given in the summary report. Activities of the reviewers were shared during the meeting. It was a requirement that a first draft of the summary report be produced during the Review Meeting. Initial drafting of the report against the Terms of Reference (TORs) was divided among the five reviewers and I drafted the text for TOR3 on BAM and Stock Synthesis assessment methods for red grouper, and TOR5 on projections for both species. The full text for the report was brought into a single document and edited by the reviewers with the assistance of the Chair on Friday 29.

2 Review of red and black grouper assessments

2.1 Terms of reference

The RP considered the assessments in light of the terms of reference provided as follows:

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, F_{msy}, B_{msy}, MSST, MFMT, or their proxies); recommend appropriate management benchmarks and provide estimated values for management benchmarks, a range of ABC, and declarations of stock status. In addition, for black grouper, the Gulf Council requests that the RP evaluate the methods used to estimate OFL.
5. 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).
6. 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.
7. Ensure that stock assessment results are clearly and accurately presented in the Stock Assessment Report, including the Summary Report, and that reported results are consistent with Review RP recommendations**.
8. Evaluate the SEDAR Process as applied to the reviewed assessments and identify any Terms of Reference which were inadequately addressed by the Data or Assessment Workshops.
9. Consider the research recommendations provided by the Data and Assessment workshops and make any additional recommendations or prioritizations warranted. Clearly denote research and monitoring needs that could improve the reliability of future assessments. Recommend an appropriate interval for the next assessment, and whether a benchmark or update assessment is warranted.
10. Prepare a Peer Review Summary summarizing the RP's evaluation of the stock assessment and addressing each Term of Reference. Develop a list of tasks to be completed following the workshop. Complete and submit the Summary Report within 3 weeks of workshop conclusion.

2.2 Findings by term of reference

2.2.1 TOR1 Evaluate the adequacy, appropriateness, and application of data used in the assessment.

In general, the input data and methods used to process them for inclusion in the assessment were adequate and appropriate. I agree with the points made in the summary report.

Unit stock for assessment purposes

It is preferable if the unit stock used for both assessment and management purposes is (a) the same, (b) the entire stock is considered for assessment, and (c) that the stock can be considered to be homogeneously distributed throughout its range. All of these conditions are rarely met, but some comments for both red and black grouper can be made against them.

There are reasonable arguments to suggest that the south Atlantic stock of red grouper is separate to those in the Gulf of Mexico (GOM). In that case, it may be that the assessed and managed stock for red grouper is the same, and that the entire stock is considered in the assessment. There appears to be a disjunction in the red grouper distribution in the south Atlantic area however, as they are rarely caught between South Carolina and Florida. The RP asked if it was possible to examine age and/or length composition data aggregated into northern and southern regions, but this was not possible during the review workshop. The DW of the GOM red grouper assessment concluded that it is possible that red grouper has a complex subpopulation structure that may not be genetically distinct but are functionally independent units. It may also be possible that functionally independent units occur in the south Atlantic stock, and this can be investigated firstly by checking for gross differences in size/age distributions between the northern and southern regions.

The black grouper stock for assessment purposes is assumed to be the same in the south Atlantic, through Florida and the Keys to west Florida, although it is recognized that the bulk of the US catch is taken in southern Florida and the Keys. Ocean currents shown during the workshop suggest that Mexico in the southern GOM is upstream of the major US fishing area. If larvae are transported into the US stock region from Mexico and beyond, then it is possible that recruitment to the US black grouper stock may be dependent on fishery impacts outside of US management control. Biological work would be required to determine if this was an important consideration.

It is a common problem for various US stocks that catch histories from neighbouring countries such as Mexico are unavailable. There would be considerable advantages to at least commence the collection of landing statistics from such places for potential straddling stocks.

Historic data documentation and archive

There are a large number of data sources for catches, abundance indices and age/size composition for red and black grouper. The development of a single document that describes each of these sources and summarizes important details has some value. Ideally, a data group would update the document periodically, and reference data sets would be archived electronically. Such a system would allow the precise specification of the procedures used to create reference data sets from the raw data, to help avoid future data loss or misuse. Provision of assessment data as spreadsheets for the review workshop was a good step in this direction, and should be adopted as standard procedure for other SEDAR review workshops.

Natural mortality

For both red and black grouper the natural mortality rate was estimated using Hoenig's method, and catch curves provided an upper bound on the estimate for sensitivity analyses. These methods used early available fishery data, but a concern is that little is known about the scale of landings from the stocks prior to about 1975 for either species. If substantial catches were taken earlier, it is possible that the estimates of natural mortality were made from depleted stocks, which would cause the natural mortality rate to be overestimated. Current assessments are very sensitive to the natural mortality rate used, so this is probably the major uncertainty in the current assessments.

It may be possible, for red grouper at least, to examine early sport fishing records to investigate the scale of historical landings. Early photographs may also be used to see if there has been a change in maximum size compared to recent times (such work has been done, for example, on grouper in the Caribbean). I recognize the confusion and similarity of black grouper and gag makes such historical investigations very difficult for that species.

2.2.2 TOR2 Evaluate the adequacy, appropriateness, and application of methods used to assess the stock.

The analytical approach was appropriate and provides an acceptable basis for management advice. I agree with the comments and recommendations in the summary report. The base cases for both red and black grouper were modified during the review after examining sensitivity analyses and diagnostics requested by the RP. Results from the modified base runs were to be compiled and made available in the weeks following the review, and at the time of writing are not completed.

Multiple approaches of catch curves, a production model and an age-structured model were applied for both species and all were useful. Catch curves provided an upper bound for *M*. Comparison of population biomass trends through time were possible with the production and age-structured models, and these were generally consistent. For both species, the assessment team selected the age-structured assessment as the most suitable for management advice, primarily because those models made best use of the available data, including age and length compositions.

While the age-structured methods were accepted by the RP as appropriate, it is always possible to suggest ways to make improvements for future assessments. For both species an improvement would be to integrate the fitting of growth within the population model, rather than as an external process. This would allow better account to be taken of selectivity effects on the fitted growth curve. It is advantageous to fit the population model directly to available length composition data, which was done for red grouper but not for black. For both species, selectivity operates on length rather than age, so length-based selection should be modeled directly.

The red grouper assessment team spent some time developing an assessment using Stock Synthesis (SS), but was not sufficiently along that path to propose using that model for management purposes. My own recommendation would be to continue this red grouper model migration to SS, and to also consider using SS for black grouper. The SS framework has a number of compelling advantages including:

- The basic dynamics and many of the options in stock synthesis have been simulation tested and verified. As a model becomes more complex, the chance of simple coding errors becomes more likely.

- SS allows growth curves to be fitted within the assessment model accounting for selectivity effects, and allows various options for changing various parameters including growth through time.

- The possible use of size-based selectivity has been recommended, and this is a standard option in SS.

- Spatial disaggregation of the population and the estimation of movement patterns or distribution of recruits among areas is possible using SS. This flexibility could be desirable for investigating, for example, possible sub-structuring of the south Atlantic red grouper stock.

- SS output includes all of the diagnostics that might be examined routinely. An R procedure is included that produces a full range of graphics showing the model fit and diagnostics for inclusion in an assessment document.

2.2.3 TOR3 Recommend appropriate estimates of stock abundance, biomass, and exploitation.

The analytical approach was appropriate and provides an acceptable basis for management advice. I agree with the comments and recommendations in the summary report.

2.2.4 TOR4 Evaluate the methods used to estimate population benchmarks and management parameters (e.g., MSY, F_{msy}, B_{msy}, MSST, MFMT, or their proxies); recommend appropriate management benchmarks and provide estimated values for management benchmarks, a range of ABC, and declarations of stock status. In addition, for black grouper, the Gulf Council requests that the RP evaluate the methods used to estimate OFL.

The analytical approach was appropriate and provides an acceptable basis for management advice. I agree with the comments and recommendations in the summary report.

Management benchmarks for black grouper used a proxy for B_{msy} as it was recognized that an actual estimate was highly uncertain. For red grouper, the assessment team provided an estimate of B_{msy} and derived management benchmarks because steepness was estimated with some precision for the base case. The RP noted that steepness can rarely be estimated with precision unless data cover a period of extreme depletion from which the stock has recovered. Neither red nor black grouper have such data, so the view of the RP was that a proxy should also be considered for red grouper.

The RP has attempted to carry forward in management recommendations the uncertainty across alternative plausible assessment models, rather than just presenting the uncertainty from within a single base case. The latter overestimates the precision of the assessment results.

Simulation testing

Simulation testing can be used to verify assessments models, compare alternative assessment model structures, and to test the robustness of harvest control rules implemented by management. An often used framework for such testing is Management Strategy Evaluation (MSE). Although the implementation of a MSE system requires a fairly large resource commitment initially, once the system has been developed, the ongoing maintenance can be minimal. While management benchmarks applied to red and black grouper generally comply with those used in many other US fisheries, generic systems may not always work well in specific circumstances. There could be a considerable advantage in building a system to test the robustness of the current harvest strategy to the major uncertainties for red and black grouper – in particular the level of discard mortality, natural mortality, and the B_{msy} estimate. A more ambitious but possibly more useful MSE could be built for the snapper-grouper complex, but few multispecies MSE systems have been built thus far.

2.2.5 TOR5 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).

The analytical approach was appropriate and provides an acceptable basis for management advice. I agree with the comments and recommendations in the summary report.

2.2.6 TOR6 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.

Uncertainty in a selection of base model parameters was estimated using MCMC or Monte-Carlo bootstrapping of the data. This within-model uncertainty was also propagated into projections. However, between-model uncertainty is normally greater in magnitude. Plausible alternative models are often used to better estimate the true uncertainty in the assessment results. Such plausible alternative models for the red and black grouper assessments could be across alternative values for *M*, different assumptions for discard mortality, different weightings applied to abundance indices and possibly models that include spatially disaggregated populations. The RP recommended that the uncertainty in *M* be carried into the management advice for the current assessments. Additional sources could be considered in future.

2.2.7 TOR7 Ensure that stock assessment results are clearly and accurately presented in the Stock Assessment Report, including the Summary Report, and that reported results are consistent with Review RP recommendations**.

This TOR was partially fulfilled, and I agree with the recommendations in the summary report. A set of standard sensitivity analyses that should accompany any base case was recommended by the RP, and also a set of standard diagnostics that should be presented for the base case and sensitivity analyses.

2.2.8 TOR8 Evaluate the SEDAR Process as applied to the reviewed assessments and identify any Terms of Reference which were inadequately addressed by the Data or Assessment Workshops.

I found the SEDAR process of data workshop, assessment workshop and review workshop for red and black grouper to be effective. The review meeting was attended by assessment scientists, managers and also stakeholder representatives who were encouraged to contribute to the proceedings. This open form of meeting worked well for the participants that were present. The TORs of the data and assessment workshops were adequately addressed.

I understand that the SEDAR process is aligned with management requirements, and that the focus is on management of species mostly in isolation. My following comments may not align as well with management requirements, and may therefore not be feasible, but I consider them worth making anyway.

Associated species

Red and black grouper are associated with other species in what is most easily described as a snapper-grouper complex. Snapper and gag grouper (*Mycteroperca microlepis*) are major target species, and both red and black grouper are caught primarily as bycatch while targeting these other species.

The data and assessments for red and black grouper have largely been prepared by separating them from the other species, primarily because management action is directed towards individual species and not such complexes as a whole. However, as the species in the larger complex are closely associated (and cross-identified such as for gag and black grouper), there may be advantages and efficiency gains in the SEDAR process being directed at the complex level, rather than at particular species or sub-groups.

For example, if the data workshop were directed at the complex, then a single account could be given for how historical catch was split among the various species. It would be a simpler task to document the processes used to produce the landings, indices and length/age composition for the species as part of the complex, rather than for the separated species. Archival of the resulting data sets would also be done for the complex.

The priorities of the assessment workshop could be directed mostly towards the important (and presumably most valuable) target species, perhaps with less priority on bycatch species, and also the potential for meaningful multispecies data analyses and

possibly multispecies assessments. At the very least there is scope to investigate target and bycatch analyses to highlight where TAC setting difficulties may occur, and multispecies production models could be examined as alternative stock assessments. A process that has taken steps along the multispecies path may be better positioned in the future to practically consider ecosystem-based fishery management options.

2.2.9 TOR9 Consider the research recommendations provided by the Data and Assessment workshops and make any additional recommendations or prioritizations warranted. Clearly denote research and monitoring needs that could improve the reliability of future assessments. Recommend an appropriate interval for the next assessment, and whether a benchmark or update assessment is warranted.

I agree with the recommendations made in the summary report. For red and black grouper the RP recommended that future research should focus on major uncertainties affecting the assessment. These are the discard mortality rate (particularly from the recreational fishery), acquiring improved fishery-independent abundance estimates, improved estimation for recreational catch and improved age and growth data. For black grouper there is a need to quantify linkages between US stocks and other stocks in the GOM in terms of contribution to recruitment. For red grouper there is a need to investigate whether there is sub-stock structure in the south Atlantic that needs to be accounted for in the assessment.

A summary of my own additional recommendations are as follows:

- A single document should be developed that describes reference data for catches, abundance indices and age/size composition and how they were created. Those reference sets should also be electronically archived at a single location.

- Efforts should be made/continued to collect landing statistics from other countries for important straddling stocks. For the GOM groupers, countries of importance may include Mexico and Belize (but also possibly Guatemala, Honduras, Nicaragua, Jamaica and Cuba).

- To reduce the uncertainty for red grouper natural mortality, examine historical catch records and possibly sport-fish photographs to determine whether the size structure of the population was different historically to that in about 1975.

- Consider using SS or similar modeling framework for both red and black grouper.

- Simulation testing should be used to compare among alternative assessment model structures, and to test the robustness of harvest strategies to uncertainty. Implementation of a MSE framework for red and black grouper would achieve these goals.

Assessment interval and level

As noted previously, it would be preferable if the priority given to the stock assessment of different species in the snapper-grouper complex was decided based on total value or conservation status or other important management criteria. It is difficult to recommend an appropriate interval or assessment type for just black and red grouper in isolation, without also knowing the likely level of resources available. Improved full assessments could be produced for both species in the standard assessment timeframe of 12 months. A minimum recommendation would be for an assessment update in 3 years. Selection of appropriate assessment effort between these bounds depends on available resources and priority that should be given to different species.

2.2.10 TOR10 Prepare a Peer Review Summary summarizing the RP's evaluation of the stock assessment and addressing each Term of Reference. Develop a list of tasks to be completed following the workshop. Complete and submit the Summary Report within 3 weeks of workshop conclusion.

Completed.

Appendix 1: Bibliography of materials provided for review

SEDAR 19
South Atlantic and Gulf of Mexico Black Grouper
South Atlantic Red Grouper
Workshop Document List

Document #	Title	Authors	Working Group
Documents Prepared for the Data Workshop			
SEDAR19-DW-01	Black grouper, *Mycteroperca bonaci*, standardized catch rates from the Marine Recreational Fisheries Statistics Survey in south Florida,1991-2008	Robert G. Muller	Indices
SEDAR19-DW-02	A fishery independent index for black grouper, *Mycteroperca bonaci*, from Florida Fish and Wildlife Research Institute's visual survey in the Florida Keys, 1999-2007	Robert G. Muller and Alejandro Acosta	Indices
SEDAR19-DW-03	Construction of a headboat index for south Atlantic red grouper	Paul Conn	Indices
SEDAR19-DW-04	Construction of a headboat index for black grouper	Paul Conn	Indices
SEDAR19-DW-05	Evaluation of the 1960, 1965, and 1970 U.S. Fish and Wildlife Service salt-water angling survey data for use in the stock assessment of red grouper (Southeast US Atlantic) and black grouper (Southeast US Atlantic and Gulf of Mexico)	Rob Cheshire and Joe O'Hop	Recreational Statistics
SEDAR19-DW-06	Steepness of spawner-recruit relationships in reef fishes of the southeastern U.S.: A prior distribution for possible use in stock assessment	Sustainable Fisheries Branch	Life History
SEDAR19-DW-07	South Atlantic Region Recreational Fishery Catches of Red and Black Grouper, 1981 - 2008 and Gulf of Mexico Landings of Black Grouper.	Tom Sminkey	Recreational Statistics
SEDAR19-DW-08	Length Frequencies and Condition of Released Red Grouper and Black Grouper from At-Sea Headboat Observer Surveys in the Gulf of Mexico and Atlantic Ocean, 2005 to 2007.	Beverly Sauls	Recreational Statistics
SEDAR19-DW-09	Age, growth, and maturity of black grouper (*Mycteroperca bonaci*) – Crabtree and Bullock (1998) revisited	Joe O'hop and Rick Beaver	Life History
SEDAR19-DW-10	Ault-Smith Notes on Reef-fish Visual Census (RVC) Population Statistics Estimation for Black Grouper (*Mycteroperca bonaci*) and Red Grouper (*Epinephelus mori*) in the Florida Keys and Dry Tortugas Regions	Jerald S. Ault and Steven G. Smith	Indices/Life History
SEDAR19-DW-11	Patterns of annual abundance of black and red grouper in the Florida Keys and Dry Tortugas based on reef fish visual census conducted by NOAA NMFS.	G. Walter Ingram, Jr. and Douglas E. Harper	Indices
SEDAR19-DW-12	A fishery independent index for red grouper, *Epinephelus morio*, from Florida Fish and Wildlife Research Institute's visual survey in the Florida Keys, 1999-2007	Robert G. Muller and Alejandro Acosta	Indices

SEDAR19-DW-13	United States Commercial Vertical Line and Longline Vessel Standardized Catch Rates of Black Grouper the Gulf of Mexico and South Atlantic, 1993-2008	Kevin McCarthy	Indices
SEDAR19-DW-14	United States Commercial Vertical Line Vessel Standardized Catch Rates of Red Grouper in the US South Atlantic, 1993-2008	Kevin McCarthy	Indices
SEDAR19-DW-15	Calculated discards of black grouper from commercial vertical line and longline fishing vessels in the Gulf of Mexico and US South Atlantic	Kevin McCarthy	Commercial Statistics
SEDAR19-DW-16	Calculated discards of red grouper from commercial vertical line fishing vessels in the US South Atlantic	Kevin McCarthy	Commercial Statistics
SEDAR19-DW-17	Patterns of annual abundance of red grouper observed in chevron traps set during the MARMAP Survey (1990 – 2008) in the U.S. South Atlantic.	G. Walter Ingram, Jr. and Jessica Stephen	Indices
SEDAR19-DW-18	Standardized catch rates of Atlantic red grouper (*Epinephelus morio*) from the North Carolina Commercial Fisheries Trip Ticket Program.	Walter Ingram, Stephanie McInerny, and Alan Bianchi	Indices
SEDAR19-DW-19	Red grouper standardized catch rates from the Marine Recreational Fisheries Statistics Survey for the southeastern U.S. Atlantic Ocean, 1991-2008	Chris Hayes and Robert G. Muller	Indices
SEDAR19-DW-20	Standardized catch rates of black grouper. *Mycteroperca bonaci*, and red grouper, *Epinephelus morio*, from Florida's commercial trip tickets, 1991-2008	Robert G. Muller	Indices
SEDAR19-DW-21	Estimated Landings and Discards of Red Grouper in the South Atlantic and Black Grouper in the South Atlantic and Gulf of Mexico Headboat Fishery, 2004-2008.	Ken Brennan	Recreational Statistics
Documents Prepared for the Assessment Workshop			
SEDAR19-AW-01	A hierarchical analysis of red grouper indices.	Paul Conn	
SEDAR19-AW-02	Red grouper: Regression and Chapman−Robson estimators of total mortality from catch curve data	Sustainable Fisheries Branch	
SEDAR19-AW-03	Additions and Updates to Red Grouper data since the SEDAR 19 Data Workshop	Sustainable Fisheries Branch	
SEDAR19-AW-04	Red Grouper: Predecisional Surplus–production Model Results	Sustainable Fisheries Branch	
SEDAR19-AW-05	A non-equilibrium surplus production model of black grouper (*Mycteroperca bonaci*) in southeast United States waters	Robert G. Muller	
SEDAR19-AW-06	Catch curves from two periods in the black grouper fishery	Robert G. Muller	
SEDAR19-AW-07	A statistical catch-age model for red grouper: mathematical description, implementation details, and computer code.	Sustainable Fisheries Branch	
SEDAR19-AW-08	Assessment history of black grouper (*Mycteroperca bonaci*) in the southeast U. S. waters	Robert G. Muller	
Documents Prepared for the Review Workshop			
SEDAR19-RW-01	A statistical catch-age model for red grouper:	Sustainable Fisheries Branch	

	mathematical description, implementation details, and computer code	
Final Stock Assessment Reports		
SEDAR19-SAR1		
SEDAR19-SAR2		
Reference Documents		
SEDAR19-RD01	Reproduction in the protogynous black grouper (*Mycteroperca bonaci* (Poey) from the southern Gulf of Mexico	Thierry Brulé, Ximena Renán, Teresa Colás-Marrufo, Yazmin Hauyon, and Armin N. Tuz-Sulub
SEDAR19-RD02	Life history of red grouper (*Epinephelus morio*) off the coasts of North Carolina and South Carolina	Julian M. Burgos, George R. Sedberry, David M. Wyanski, and Patrick J. Harris
SEDAR19-RD03	Trends in catch data and estimated static SPR values for fifteen species of reef fish landed along the southeastern United States	Jennifer C. Potts and Ken Brennan
SEDAR19-RD04	Density, species and size distribution of groupers (Serranidae) in three habitats at Elbow Reef, Florida Keys	Robert Sluka, Mark Chiappone, Kathleen M. Sullivan, Thomas A. Potts, Jose M. Levy, Emily F. Schmitt and Geoff Meester
SEDAR19-RD05	Population genetic analysis of red grouper, *Epinephelus morio*, and scamp, *Mycteroperca phenax*, from the southeastern U.S. Atlantic and Gulf of Mexico	M. S. Zatcoff, A. O. Ball and G. R. Sedberry
SEDAR19-RD06	The 1960 Salt-Water Angling Survey, USFWS Circular 153	J. R. Clark
SEDAR19-RD07	The 1965 Salt-Water Angling Survey, USFWS Resource Publication 67	D. G. Deuel and J. R. Clark
SEDAR19-RD08	1970 Salt-Water Angling Survey, NMFS Current Fisheries Statistics Number 6200	D. G. Deuel
SEDAR19-RD09	Age, growth, and reproduction of black grouper, *Mycteroperca bonaci*, in Florida waters	Roy E. Crabtree and Lewis H. Bullock
SEDAR19-RD10	Age and growth of the warsaw grouper and black grouper from the southeast region of the United States	Charles S. Manooch, III and Diane L. Mason
SEDAR19-RD11	The influence of spear fishing on species composition and size of groupers on patch reefs in the upper Florida Keys	Robert D. Sulka and Kathleen M. Sullivan
SEDAR19-RD12	Aspects of fishing and reproduction of the black grouper *Mycteroperca bonaci* (Poey, 1860) (Serranidae: Epinephelinae) in the Northeastern Brazil	Simone Ferreira Teixeira, Beatrice Padovani Ferreira and Isaíras Pereira Padovan**
SEDAR19-RD13	Diet composition of juvenile black grouper (*Mycteroperca bonaci)* from coastal nursery areas of the Yucatan Peninsula, Mexico	Thierry Brulé, Enrique Puerto-Novelo, Esperanza Pérez-Díaz, and Ximena Renán-Galindo
SEDAR19-RD14	Life history of the red grouper *(Epinephelus morio)* off the North Carolina and South Carolina coast	Julian M. Burgos
SEDAR19-RD15	Mean Size at Age: An Evaluation of Sampling Strategies with Simulated Red Grouper Data	C. Phillip Goodyear
SEDAR19-RD16	Evaluation of average length as an estimator of exploitation status for the Florida coral reef fish community.	Ault, J.S., S.G. Smith, and J.A. Bohnsack
SEDAR19-RD17	A retrospective (1979-1996) multispecies assessment of coral reef fish stocks in the Florida Keys	Ault, J.S., J.A. Bohnsack, and G.A. Meester
SEDAR19-RD18	Building sustainable fisheries in Florida's	Ault, J.S., S.G. Smith, J.A. Bohnsack, J.

	coral reef ecosystem: positive signs in the Dry Tortugas.	Luo, D.E. Harper, and D.B. McClellan
SEDAR19-RD19	Are the coral reef finfish fisheries of south Florida sustainable?	Ault, J.S., S.G. Smith and J.T. Tilmant
SEDAR19-RD20	Fishery management analyses for reef fish in Biscayne National Park: bag & size limits	Ault, J.S., S.G. Smith, and J.T. Tilmant
SEDAR19-RD21	Site characterization for Biscayne National Park: assessment of fisheries resources and habitats	Ault, J.S., S.G. Smith, G.A. Meester, J. Luo, and J.A. Bohnsack
SEDAR19-RD22	Baseline Multispecies Coral Reef Fish Stock Assessment for the Dry Tortugas	Jerald S. Ault, Steven G. Smith, Geoffrey A. Meester, Jiangang Luo, James A. Bohnsack, and Steven L. Miller
SEDAR19-RD23	Movement of yellowtail snapper (*Ocyurus chrysurus* Block 1790) and black grouper (*Mycteroperca bonaci* Poey 1860) in the northern Florida Keys National Marine Sanctuary as determined by acoustic telemetry	James Lindholm, Les Kaufman, Steven Miller, Adam Wagschal and Melinda Newville
SEDAR19-RD24	Coral reef fish response to FKNMS management zones: the first ten years (1997-2007)	James A. Bohnsack, Douglas E. Harper, David B. McClellan, and G. Todd Kellison and Jerald S. Ault, Steven G. Smith, Natalia Zurcher
SEDAR19-RD25	Reef fish movements and marine designs	Nick Farmer
SEDAR19-RD26	A Cooperative Multi-agency Reef Fish Monitoring Protocol for the Florida Keys Coral Reef Ecosystem	Marilyn E. Brandt, Natalia Zurcher, Alejandro Acosta, Jerald S. Ault, James A. Bohnsack, Michael W. Feeley, Doug E. Harper, John Hunt, Todd Kellison, David B. McClellan, Matt E. Patterson, Steven G. Smith1
SEDAR19-RD27	The Natural Mortality Rate of Gag Grouper: A Review of Estimators for Data-Limited Fisheries	Trevor J. Kenchington
SEDAR19-RD28	Population Assessment of the Scamp, *Mycteroperca phenax,* from the Southeastern United States	Charles S.Manooch, III, Jennifer C. Potts, Michael L. Burton, and Patrick J. Harris
SEDAR19-RD29	A Review for Estimating Natural Mortality in Fish Populations	Kate. I. Siegfried & Bruno Sansó
SEDAR19-RD30	Bottom longline fishery bycatch of black grouper from observer data	Loraine Hale and John Carlson
SEDAR19-RD31	Characterization of the shark bottom longline fishery: 2007	Loraine Hale, Lisa D. Hollensead, and John Carlson
SEDAR19-RD32	2009 Gulf of Mexico Red Grouper Update Report	
SEDAR19-RD33	Aspects of the Life History of Red Grouper, *Epinephelus morio*, Along the Southeastern United States	John C. McGovern, Julian M. Burgos, Patrick J. Harris, George R. Sedberry, Joshua K. Loefer, Oleg Pashuk and Daniel Russ
SEDAR19-RD34	User Manual for Stock Synthesis Model Version 3.04	Richard D. Methot Jr.

Appendix 2: A copy of the CIE Statement of Work

Statement of Work for Dr. Neil Klaer

External Independent Peer Review by the Center for Independent Experts

SEDAR 19 South Atlantic red grouper and South Atlantic and Gulf of Mexico black grouper Review Workshop

Scope of Work and CIE Process: The National Marine Fisheries Service's (NMFS) Office of Science and Technology coordinates and manages a contract providing external expertise through the Center for Independent Experts (CIE) to conduct independent peer reviews of NMFS scientific projects. The Statement of Work (SoW) described herein was established by the NMFS Project Contact and Contracting Officer's Technical Representative (COTR), and reviewed by CIE for compliance with their policy for providing independent expertise that can provide impartial and independent peer review without conflicts of interest. CIE reviewers are selected by the CIE Steering Committee and CIE Coordination Team to conduct the independent peer review of NMFS science in compliance the predetermined Terms of Reference (ToRs) of the peer review. Each CIE reviewer is contracted to deliver an independent peer review report to be approved by the CIE Steering Committee and the report is to be formatted with content requirements as specified in **Annex 1**. This SoW describes the work tasks and deliverables of the CIE reviewer for conducting an independent peer review of the following NMFS project. Further information on the CIE process can be obtained from www.ciereviews.com.

Project Description: SEDAR 19 will be a compilation of data, a benchmark assessment of the stock, and an assessment review for conducted for Gulf of Mexico and South Atlantic black grouper and South Atlantic red grouper. 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 stocks assessed through SEDAR 19 are within the jurisdiction of the Gulf of Mexico and South Atlantic Fishery Management Councils and the states of Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, and North Carolina. The Terms of Reference (ToRs) of the peer review are attached in **Annex 2**. The tentative agenda of the panel review meeting is attached in **Annex 3**.

Requirements for CIE Reviewers: Three CIE reviewers shall conduct an impartial and independent peer review in accordance with the SoW and ToRs herein. CIE reviewers shall have working knowledge and recent experience in the application of stock assessment, statistics, fisheries science, and marine biology sufficient to complete the primary task of reviewing the technical details of the methods used for the assessment. Each CIE reviewer's duties shall not exceed a maximum of 14 days to complete all work tasks of the peer review described herein.

Location of Peer Review: Each CIE reviewer shall conduct an independent peer review during the panel review meeting scheduled in Savannah, Georgia during 25-29 January 2010.

Statement of Tasks: Each CIE reviewers shall complete the following tasks in accordance with the SoW and Schedule of Milestones and Deliverables herein.

Prior to the Peer Review: Upon completion of the CIE reviewer selection by the CIE Steering Committee, the CIE shall provide the CIE reviewer information (full name, title, affiliation, country, address, email) to the COTR, who forwards this information to the NMFS Project Contact no later the date specified in the Schedule of Milestones and Deliverables. The CIE is responsible for providing the SoW and ToRs to the CIE reviewers. The NMFS Project Contact is responsible for providing the CIE reviewers with the background documents, reports, foreign national security clearance, and other information concerning pertinent meeting arrangements. The NMFS Project Contact is also responsible for providing the Chair a copy of the SoW in advance of the panel review meeting. Any changes to the SoW or ToRs must be made through the COTR prior to the commencement of the peer review.

Foreign National Security Clearance: When CIE reviewers participate during a panel review meeting at a government facility, the NMFS Project Contact is responsible for obtaining the Foreign National Security Clearance approval for CIE reviewers who are non-US citizens. For this reason, the CIE reviewers shall provide requested information (e.g., first and last name, contact information, gender, birth date, passport number, country of passport, travel dates, country of citizenship, country of current residence, and home country) to the NMFS Project Contact for the purpose of their security clearance, and this information shall be submitted at least 30 days before the peer review in accordance with the NOAA Deemed Export Technology Control Program NAO 207-12 regulations available at the Deemed Exports NAO website: http://deemedexports.noaa.gov/sponsor.html).

Pre-review Background Documents: Two weeks before the peer review, the NMFS Project Contact will send (by electronic mail or make available at an FTP site) to the CIE reviewers the necessary background information and reports for the peer review. In the case where the documents need to be mailed, the NMFS Project Contact will consult with the CIE Lead Coordinator on where to send documents. CIE reviewers are responsible only for the pre-review documents that are delivered to the reviewer in accordance to the SoW scheduled deadlines specified herein. The CIE reviewers shall read all documents in preparation for the peer review.

The NMFS Project Contact will update this section with a list of background document and estimated number of pages no later than 15 October 2009.

Panel Review Meeting: Each CIE reviewer shall conduct the independent peer review in accordance with the SoW and ToRs, and shall not serve in any other role unless specified herein. **Modifications to the SoW and ToRs can not be made during the peer review, and any SoW or ToRs modifications prior to the peer review shall be approved by the COTR and CIE Lead Coordinator.** Each CIE reviewer shall actively participate in a professional and respectful manner as a member of the meeting review panel, and their peer review tasks shall be focused on the ToRs as specified herein. The NMFS Project Contact is responsible for any facility arrangements (e.g., conference room for panel review meetings or teleconference arrangements). The NMFS Project Contact is responsible for ensuring that the Chair understands the contractual role of the CIE reviewers as specified herein. The CIE Lead Coordinator can contact the Project Contact to confirm any peer review arrangements, including the meeting facility arrangements.

Contract Deliverables - Independent CIE Peer Review Reports: Each CIE reviewer shall complete an independent peer review report in accordance with the SoW. Each CIE reviewer shall complete the independent peer review according to required format and content as described in Annex 1. Each CIE reviewer shall complete the independent peer review addressing each ToR as described in Annex 2.

Other Tasks – Contribution to Summary Report: Each CIE reviewer may assist the Chair of the panel review meeting with contributions to the Summary Report, based on the terms of reference of the review. Each CIE reviewer is not required to reach a consensus, and should provide a brief summary of the reviewer's views on the summary of findings and conclusions reached by the review panel in accordance with the ToRs.

Specific Tasks for CIE Reviewers: The following chronological list of tasks shall be completed by each CIE reviewer in a timely manner as specified in the **Schedule of Milestones and Deliverables**.

1) Conduct necessary pre-review preparations, including the review of background material and reports provided by the NMFS Project Contact in advance of the peer review.
2) Participate during the panel review meeting in Savannah, Georgia during 25-29 January 2010.
3) During the 25-29 January 2010 meeting in Savannah Georgia, the CIE reviewers shall conduct an independent peer review in accordance with the ToRs (**Annex 2**).
4) No later than 8 February 2010, each CIE reviewer shall submit an independent peer review report addressed to the "Center for Independent Experts," and sent to Mr. Manoj Shivlani, CIE Lead Coordinator, via email to shivlanim@bellsouth.net, and David Sampson CIE Regional Coordinator, via email to david.sampson@oregonstate.edu. Each CIE report shall be written using the format and content requirements specified in Annex 1, and address each ToR in **Annex 2**.

Schedule of Milestones and Deliverables: CIE shall complete the tasks and deliverables described in this SoW in accordance with the following schedule.

20 December 2009	CIE sends reviewer contact information to the COTR, who then sends this to the NMFS Project Contact
11January 2010	NMFS Project Contact sends the CIE Reviewers the pre-review documents
25-29 January 2010	Each reviewer participates and conducts an independent peer review during the panel review meeting
8 February 2010	CIE reviewers submit draft CIE independent peer review reports to the CIE Lead Coordinator and CIE Regional Coordinator
22 February 2010	CIE submits CIE independent peer review reports to the COTR
28 February 2010	The COTR distributes the final CIE reports to the NMFS Project Contact and regional Center Director

Modifications to the Statement of Work: Requests to modify this SoW must be approved by the Contracting Officer at least 15 working days prior to making any permanent substitutions. The Contracting Officer will notify the COTR within 10 working days after receipt of all required information of the decision on substitutions. The COTR can approve changes to the milestone dates, list of pre-review documents, and ToRs within the SoW as long as the role and ability of the CIE reviewers to complete the deliverable in accordance with the SoW is not adversely impacted. The SoW and ToRs shall not be changed once the peer review has begun.

Acceptance of Deliverables: Upon review and acceptance of the CIE independent peer review reports by the CIE Lead Coordinator, Regional Coordinator, and Steering Committee, these reports shall be sent to the COTR for final approval as contract deliverables based on compliance with the SoW and ToRs. As specified in the Schedule of Milestones and Deliverables, the CIE shall send via e-mail the contract deliverables (CIE independent peer review reports) to the COTR (William Michaels, via William.Michaels@noaa.gov).

Applicable Performance Standards: The contract is successfully completed when the COTR provides final approval of the contract deliverables. The acceptance of the contract deliverables shall be based on three performance standards:
(1) Each CIE report shall completed with the format and content in accordance with **Annex 1**,
(2) Each CIE report shall address each ToR as specified in **Annex 2**,
(3) The CIE reports shall be delivered in a timely manner as specified in the schedule of milestones and deliverables.

Distribution of Approved Deliverables: Upon acceptance by the COTR, the CIE Lead Coordinator shall send via e-mail the final CIE reports in *.PDF format to the COTR. The COTR will distribute the CIE reports to the NMFS Project Contact and Center Director.

Key Personnel:

William Michaels, Contracting Officer's Technical Representative (COTR)
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

Manoj Shivlani, CIE Lead Coordinator
Northern Taiga Ventures, Inc.
10600 SW 131st Court, Miami, FL 33186
shivlanim@bellsouth.net Phone: 305-383-4229

Julie Neer, SEDAR 19 Coordinator, NMFS Project Contact
South Atlantic Fishery Management Council
4055 Faber Place, Suite 201
North Charleston, SC 29405
Julie.Neer@SAFMC.net Phone: 843-571-4366

Annex 1: Format and Contents of CIE Independent Peer Review Report

1. The CIE independent report shall be prefaced with an Executive Summary providing a concise summary of the findings and recommendations, and specify whether the science reviewed is the best scientific information available.

2. The main body of the reviewer report shall consist of a Background, Description of the Individual Reviewer's Role in the Review Activities, Summary of Findings for each ToR in which the weaknesses and strengths are described, and Conclusions and Recommendations in accordance with the ToRs.

   a. Reviewers should describe in their own words the review activities completed during the panel review meeting, including providing a brief summary of findings, of the science, conclusions, and recommendations.

   b. Reviewers should discuss their independent views on each ToR even if these were consistent with those of other panelists, and especially where there were divergent views.

   c. Reviewers should elaborate on any points raised in the Summary Report that they feel might require further clarification.

   d. Reviewers shall provide a critique of the NMFS review process, including suggestions for improvements of both process and products.

   e. The CIE independent report shall be a stand-alone document for others to understand the weaknesses and strengths of the science reviewed, regardless of whether or not they read the summary report. The CIE independent report shall be an independent peer review of each ToRs, and shall not simply repeat the contents of the summary report.

3. The reviewer report shall include the following appendices:

   Appendix 1: Bibliography of materials provided for review
   Appendix 2: A copy of the CIE Statement of Work
   Appendix 3: Panel Membership or other pertinent information from the panel review meeting.

Annex 2: Terms of Reference for the Peer Review

SEDAR 19 South Atlantic red grouper and South Atlantic and Gulf of Mexico black grouper Review Workshop

Below or the correct TORs for the Review Workshop:

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*); recommend appropriate management benchmarks and provide estimated values for management benchmarks, a range of ABC, and declarations of stock status.
    A. In addition, for black grouper, the Gulf Council requests that the Panel evaluate the methods used to estimate OFL.
5. 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).
6. 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.
7. Ensure that stock assessment results are clearly and accurately presented in the Stock Assessment Report, including the Summary Report, and that reported results are consistent with Review Panel recommendations**.
8. Evaluate the SEDAR Process as applied to the reviewed assessments and identify any Terms of Reference which were inadequately addressed by the Data or Assessment Workshops.
9. Consider the research recommendations provided by the Data and Assessment workshops and make any additional recommendations or prioritizations warranted. Clearly denote research and monitoring needs that could improve the reliability of future assessments. Recommend an appropriate interval for the next assessment, and whether a benchmark or update assessment is warranted.
10. Prepare a Peer Review Summary summarizing the Panel's evaluation of the stock assessment and addressing each Term of Reference. Develop a list of tasks to be completed following the workshop. Complete and submit the Summary Report within 3 weeks of workshop conclusion.

Annex 3: Agenda

SEDAR 19 South Atlantic red grouper and South Atlantic and Gulf of Mexico black grouper Review Workshop

Savannah, Georgia during 25-29 January 2010

Monday

1:00 p.m.	**Convene**	
1:00 – 1:30	**Introductions and Opening Remarks**	**Coordinator**
	- Agenda Review, TOR, Task Assignments	
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**	**TBD**
	- Assessment Data & Methods	
	- Identify additional analyses, sensitivities, corrections	
3:30 p.m. – 4:00 p.m.	**Break**	
4:00 p.m. – 6:00 p.m.	**Panel Discussion**	**Chair**
	- Continue deliberations	
	- Review additional analyses	

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

Wednesday

8:30 a.m. – 11:30 a.m.	**Panel Discussion**	**Chair**
	- Review additional analyses, sensitivities	
	- recommendations and comments	
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, Report drafts begun

Thursday

8:30 a.m. – 11:30 a.m.	**Panel Discussion**	**Chair**
	- Final sensitivities reviewed.	
	- Projections reviewed.	
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**	**Chair**
	- Review Reports	

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

Friday

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

Appendix 3: List of participants

Appointee	Function	Affiliation
Review Panel		
Chris Legault	Review Panel Chair	NEFSC
Paul Medley	CIE Reviewer	
Stuart Reeves	CIE Reviewer	CEFAS
Neil Klaer	CIE Reviewer	
Gary Grossman	Council Appointed Reviewer	SAFMC
Sean Powers	Council Appointed Reviewer	GMFMC
Analytical Team Representation		
Kyle Sherzter	Red grouper lead analyst	NMFS Beaufort
Bob Muller	Black grouper lead analyst	FWRI
Rob Cheshire	Analytic support	NMFS Beaufort
Joe O'Hop	Analytic support	FWRI
Official Observers		
Dennis O'Hern	AP/Fisherman rep – Black grouper (GMFMC)	West Central FL/private
Council Representation		
Brian Cheuvront	South Atlantic Council Member	SAFMC
George Geiger	South Atlantic Council Member	SAFMC
Bob Gill	Gulf of Mexico Council Member	GMFMC
Luiz Barbieri	AW Rep– Black grouper	SAFMC and GMFMC SSC
Anne Lange	AW Rep – Red grouper	SAFMC SSC
Staff		
Julie A Neer	SEDAR Coordinator	SEDAR
Rachael Lindsay	Administrative Assistant	SEDAR
Carrie Simmons	Gulf of Mexico Council Staff Lead	GMFMC
John Carmichael	South Atlantic Council Staff	SAFMC
Kari Fenske	South Atlantic Council Staff	SAFMC
Gregg Waugh	South Atlantic Council Staff	SAFMC
Patrick Gilles	IT Support	NMFS Miami
Other Observers		
Rusty Hudson		DSF, Inc.
Marcus Drymon		NMFS - Pascagoula