Center for Independent Experts

SEDAR 28 Review Workshop

South Atlantic Spanish Mackerel and Cobia

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Executive Summary

The SEDAR 28 Review Panel Workshop was held in Atlanta Georgia The Week of October 29th 2012. Prior to this meeting there initially were supposed to be four stocks under consideration: Gulf of Mexico and South Atlantic Spanish Mackerel and Gulf of Mexico and South Atlantic Cobia. All Gulf of Mexico stocks were removed from review a few weeks prior to the review.

Both Spanish mackerel and Cobia used a statistical catch at age model called the Beaufort Assessment Model (BAM) as a primary tool. However both assessments also had alternative runs using a surplus production approach (ASPIC) as a secondary method. The Cobia assessment in addition had a catch curve method that was also considered.

The Spanish mackerel and Cobia assessments had many similar flaws, namely the data. For Spanish mackerel the size and/or age distribution for the shrimp discards was problematic. For Cobia the difficulty was a lack of adequate age sampling for the commercial catch. Both stocks had indices of abundance, but only Spanish mackerel had a fishery independent index.

Overall, however, both assessment teams brought the best analytical assessment possible to the workshop. While the data and uncertainty surrounding the stock-recruitment and steepness were issues, the assessments for both stocks showed overfishing not occurring, and each stock as not overfished. Additionally both the data that went into these assessments, and the methods used represent the best available and were appropriate for management use. Despite that, a number of improvements can still be made, and research recommendations are listed for both stocks.

Background

The Review workshop was held during the week of October 29th 2012 in Atlanta, Georgia, USA. The stocks under review were South Atlantic Spanish Mackerel and Cobia. Initially this review was supposed to examine a total of four stocks; South Atlantic Cobia and Spanish mackerel, as well as Gulf of Mexico Cobia and Spanish mackerel. However just prior to the review workshop, the Gulf stocks were pulled from the Review as they were not ready.

One facet of this Review workshop, in addition to the reduction in the number of stocks reviewed, was that the assessment workshop held in Miami earlier this year did not produce a finalized model or approach. Because the data for the assessment workshop were submitted later than anticipated, the bulk of the model design, testing, and evaluation by the assessment team was conducted in a series of Webinars, from June through October.

Another complicating factor was the development of a very large storm that was impacting the US east coast exactly at the time of review. This weather event delayed one member of the panel until Wednesday that week, as well as impacting my own family at home.

Both the Cobia and Spanish mackerel assessments had the Beaufort Assessment Model (BAM) as the primary analytical tool. However for both stocks a surplus production model (ASPIC) was also run. Both assessments and methods had multiple sensitivity analysis associated with them, to test some of the assumptions that went into model development.

It should be noted that, where possible, comments on the process and overall conclusions are presented for both stocks simultaneously in this report. However the Terms of Reference are separated by stock to clearly distinguish one from the other. At the end of each stock's TOR is a list, with justification and results, of the sensitivities and additional runs suggested by the Panel.

Reviewer's Role

As an independent reviewer my role was to evaluate each assessment with regards to the Terms of reference and provide an examination of deficiencies and strengths. Also, I was to provide comment not only on the merits and deficiencies, but also on the process and other aspects of this Review workshop

Unlike the other independent reviewers on the panel, I was also present as an observer during the assessment workshop held in Miami earlier his year. Additionally, I reviewed the reports and materials pertaining to a series of webinars held between Assessment and Review workshops; as well as the audio files of the Webinars.

Summary of Findings

<u>Terms of Reference for Cobia</u>

1. Evaluate the quality and applicability of data used in the assessment.

The review panel concluded, and I concurred, that the data used in the assessment were overall the best available; however there was some concern that the assessment team may have tried to make more use of the data than the quality would allow. For example, the lack of age data on the surface suggested that an age structured assessment may not be the correct tool for this stock. However, after careful consideration I agreed with my colleagues that there was, in fact, a progression of cohorts through the catch-at-age data, and therefore the data were probably useful enough to complete an age structured assessment.

Another concern was the minimum size in the recreational fishery and how that impacted the results. The assessment team used a Diaz correction to infer length comps given the minimum size regulations. And while this correction is probably appropriate for selectivity calculation, the translation of number of fish, back to weight can be difficult when used for management purposes; if the numbers at length are calculated as an intermediary step.

For the life-history data, the use of tagging information greatly enhanced this assessment, for both stock identification and movement. However I wonder, like my colleagues, if the tagging data might have also been used to monitor fishing mortality and natural mortality. Additionally the data that went into the maturity ogive were quite limited. This is an important aspect that should be addressed in the future, as it relates to calculation of the Spawning stock biomass, recruitment and reference points. Overall the natural mortality vector based on the Lorenzen model was appropriate, and the use of sensitivity analysis by the assessment team further clarified this uncertainty satisfactorily.

Commercial landings data were available to 1950, and a combination of MRFSS and the new MRIP were used to calculate recreational removals. The calibration, in my opinion, between MRFSS and the MRIP was appropriate. However, discard information, particularly discards and age, were sorely lacking in this assessment. Likewise the commercial discards were generated using a static kept-to-discarded ratio from 1983 to 1993, and were not very well estimated prior to that. However it is duly noted that the commercial landings and discards are a small fraction of the overall removals, and as such did not impact the results significantly.

Age and length composition data were very poor for an age structured assessment, in my view. Commercial length and age compositions were pooled across years (1982-2011) despite landings data back to 1950. The result was that, for the commercial data, there was no contrast of varying strengths of cohorts. As such the model was fitting to simply one overall age composition, rather than by year. This is a serious flaw in the assessment, but given the lack of data, unavoidable. Recreational length and age data were better by far than the commercial; however sample sizes were still very small. This contributes to a major uncertainty in the assessment as almost all cohort information is derived from the recreational age and length composition data.

Three fishery independent indices were used in the assessment, a recreational head boat index, the Marine Recreational Fishery Statistical Survey (MRFSS) index and the South Carolina Department of Natural Resources (SCDNR) charter boat index. Together these indices covered the range of the stock well and had a moderately long time series. While these indices were standardized, cobia is usually not targeted by fishermen recreationally and as such is only incidentally caught. Further the two fish bag limit, which is rarely constraining, suggested that the data might be a better indication of presence/absence. Overall, the indices were not very correlated and didn't give a very clear picture of the overall abundance.

It should be clearly realized that there was no fishery independent index for this stock, and as such no direct measure of stock abundance. Such a lack of fishery independent data can be problematic for some assessments; but for Cobia it appeared not to be the case.

2. Evaluate the quality and applicability of methods used to assess the stock.

Overall I agreed with the rest of the Panel that the Beaufort Assessment Model (BAM), a statistical catch at age formulation, was superior to the surplus production model also presented. That said, there is a high degree of uncertainty associated with the BAM, both model and data derived. Sensitivities that were both requested and run by the assessment team prior to the workshop adequately highlighted this uncertainty, in my view. But the use of an age-structured assessment model for this stock is tenuous at best, given the lack of age data. However, given the poor performance of the surplus production model, my view is that this is the best available method.

In addition the assessment team also ran a standard catch curve analysis as a third alternate. While the catch curve did provide some limited information that supported the BAM results, overall it was not an appropriate model for this stock.

3. Evaluate the assessment with respect to the following:

- *Is the stock overfished? What information helps you reach this conclusion?*
- *Is the stock undergoing overfishing? What information helps you reach this conclusion?*
- *Is there an informative stock recruitment relationship? Is the stock recruitment curve reliable and useful for evaluation of productivity and future stock conditions?*
- *Are quantitative estimates of the status determination criteria for this stock reliable? If not, are there other indicators that may be used to inform managers about stock trends and condition?*

The Panel concluded, and I concurred, that there is only a small probability that this stock is experiencing overfishing. However, the biomass reference points, and status as to overfished, is less certain. The plethora of sensitivity analyses performed prior to and during the workshop helped frame this question and provided some solutions.

The stock recruitment relationship and steepness were highly uncertain in this assessment. While the uncertainty is well captured, managers should be aware of this uncertainty and take appropriate caution. This uncertainty has significant impact on stock status and projections into the future (see below). It is noted that while there is much uncertainty surrounding the stock recruitment relationship, overall this stock is not experiencing reduced recruitment in any way. Recruitment, though uncertain, seems fairly robust.

Given the lack of correlation in the fishery dependent indices and a lack of fishery independent indices, there are no other indicators of stock status other than this assessment. However this assessment does

represent the best available determination of status, and the conclusions drawn are robust analytically and provide a sound basis for management.

Given that, and with the Help of Steve Cadrin and Marcel Reichert, the Panel was able to make the following advice to the SCC and managers

- For P* use SAFMC tiered approach, applying additive penalties to P* =0.5: for cobia (P* = 0.325 = 0.5 - 0.175).
- Assessment Information – Tier 2: Quantitative assessment provides estimates of either exploitation or biomass, but not MSY benchmarks; requires proxy reference points. (P* penalty=-0.025; steepness was fixed at h=0.75)
- Uncertainty – Tier 3: Medium: This tier represents assessments in which key uncertainties are addressed via statistical techniques and sensitivities, but the full uncertainties are not carried forward into the projections and reference point calculations. Projections may, however, reflect uncertainty in recruitment and population abundance. Although outputs include distributions of F, FMSY as in the 'High' category above, in this category fewer uncertainties are addressed in developing such distributions. One example for this level is a distribution of FMSY which only reflects uncertainty in recruitment. (P* penalty = -0.05).
- Stock Status – Tier 1: Neither overfished nor overfishing, and stock is at high biomass and low exploitation relative to benchmark values. (P* penalty = 0).
- Productivity-Susceptibility Analysis – Tier 3: High Risk. Low productivity, high vulnerability and susceptibility, score >3.181 (P* penalty = -0.1; PSA score = 3.29, MRAG 2009).

4. Evaluate the adequacy, appropriateness, and application of the methods used to project future population status with regard to accepted practices and data available for this assessment.

The methods used for projection were adequate and appropriate. I found that a major source of uncertainties in the projections derived from steepness. As these were fully analyzed using sensitivity analyses, the uncertainties in the projections are well captured.

5. If there are significant changes to the base model, or to the choice of alternate states of nature, then provide a probability distribution function for the base model, or a combination of models that represent alternate states of nature, presented for review. Provide justification for the weightings used in producing the combinations of models.

Despite extensive testing, both prior to and during this workshop, significant changes to the base model were not suggested. Further work and research should continue as outlined in the research recommendations (see below).

6. Consider how uncertainties in the assessment, and their potential consequences, have been addressed.

- *Comment on the degree to which methods used to evaluate uncertainty reflect and capture the significant sources of uncertainty.*
- *Ensure that the implications of uncertainty in technical conclusions are clearly stated.*

Uncertainty was considered and analyzed using two separate methods in this assessment. First MCMC was used to examine variability in the input parameters. Additionally sensitivity runs were conducted to examine the potential for stable states of nature and to explore the model's sensitivity. These included changes to natural mortality, steepness, discard assumptions, indices, stocking, fecundity, changes in the likelihood weighting, and examination of catchablity in the survey indices. Of these the model seemed most sensitive to changes in natural mortality and steepness, as expected.

In addition the assessment team conducted a retrospective analysis; where the last year of the assessment data were removed sequentially to examine bias in the estimated status. The results of this examination suggested that the model did not have a persistent bias, but changes were seen when the model was "peeled" back to years in which the data were even more limiting.

These uncertainties are all well captured in the report, and further requests by the panel are outlined below.

7. 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, and information provided by, future assessments.*

A. Discarding

One deficiency that should be addressed in regards to Cobia is discarding. Age and length data, and even simple discard rate observations, could be important, as these are a major source of uncertainty in the current assessment. Data on discarding, particularly as a result of recreational management measures, could help inform not only the assessment, but management actions as well. In addition to the age/length data and rates, the reason for discarding would also be an important aspect to capture. This might inform managers as to the effectiveness of measures imposed, but would also help to inform the assessment of this stock.

B. Age, Length, and maturity

Overall there is a real need to gather more data with regards to age, length, and maturity. Such information could vastly improve the assessment allowing, for example, the fitting of age or length compositions in the BAM structure. Additionally data on age at maturity as well as weight by length could vastly improve the model's performance in future years; while simultaneously increasing the precision of the reference points currently used to manage this stock.

C. Tagging

Both the Assessment and the Data workshops suggested that tagging might help inform and improve the state of knowledge of Cobia in the South Atlantic. The Panel supported this suggestion. Overall, tagging can not only improve estimates of stock identification, but also directly improve estimates of discards in the recreational fishery. Further, survivability and fishing/natural mortality can also be estimated and examined. Given this and the relatively low cost of such a program, tagging can be an effective way of improving this stock's data quality in the short term.

Additional Model Runs and Sensitivities Requested by the Panel

1. Evaluation of dome-shaped selectivity for cobia assessment

Rational: It was noted that the proposed assessment model was based on an assumption that the dominant fishery, the recreational fishery, was modeled with a selectivity at age based on a logistic curve asymptotic to full selection. However, the fishery was reported to be diverse with respect to variation in population density, season, latitude and onshore offshore variability. Such variability might be expected to characterized by a dome shaped selection function even though the gear interaction could be considered logistic. Also the evaluation would explore the sensitivity of F/Fmsy and SSB/SSBmsy to the selectivity assumption.

Outcome: Initially a fixed decline in selection with age was tested and secondly some alternative fitting methods were tested. The alternative assumption on selection resulted in very similar residual patterns and very similar overall fit, indicating that the data may not be sufficient to differentiate between the two alternatives. Further exploration using a single parameter to determine the rate of decline in selection above the fitted peak suggests a rather flat likelihood surface but does show a minimum that occurs with some doming. Dome shaped selection does not change the general perception of stock status with respect to the 'over fished' or 'over fishing' criteria. However, use of dome shaped selection supports a perception that F/Fmsy is lower and SSB/SSBmsy is greater.

2. Time varying selectivity

Rational: The Review Panel requested a sensitivity analysis to evaluate the effects of assuming constant selectivity. The most reasonable basis for a change in selectivity was the 1990 regulation for a two-fish bag limit. Accordingly, an alternative BAM configuration was developed with two selectivity periods (1950-1990 and 1991-2011) for the recreational fleet.

Outcome: The additional model parameters produced only a slightly improved fit to early age composition data, and minor changes in relative stock size and fishing mortality in the late 1990s, but negligible changes to more recent estimates and no change in stock status. Therefore, the Review Panel concluded that the constant selectivity assumption was the most parsimonious model, and results were not sensitive to a change in selectivity from the bag limit regulation.

3. Evaluation of alternative (Ricker) S-R model.

Rational: It was noted that the proposed assessment model was based on an assumption that the S-R model was the Beverton/Holt form. Examination of the SSB Rec pairs indicate a significant fall in recruitment with increasing SSB and a difficulty in the S-R model fitting with an inability to estimate steepness for the BH model. Also the evaluation would explore the sensitivity of F/Fmsy and SSB/SSBmsy to an alternative S-R assumption.

Outcome: The alternative assumption on the S-R model resulted in a closer fit to the S-R pairs and slightly poorer overall fit, but because an additional parameter estimating steepness could now be fitted in the model, the number of fitted parameters increased. However, the steepness parameter does not come from information on slope to the origin, but rather from the mathematical construct of the Ricker model and the information on the decline in recruitment at high biomass that mathematically implies the steepness. The perception of stock status with respect to the 'over fished' or 'over fishing' criteria was unchanged, however, the use of Ricker S-R model results in a perception that F/Fmsy is slightly lower and SSB/SSBmsy is slightly greater. It is suggested that S-R model choice is best selected based on an understanding of population biology rather than just fit criteria alone.

4. Exploration of growth model assumptions.

Rational: There were a number of interlinking issues associated with data preparation and the modeling of growth, the maturation ogive and the fraction discarded. There were some indications in the data that mean weight at age 3 might be underestimated as growth before and after maturation appears to fit different V-B growth models. The truncation should also be linked to estimated discard rates and the uses of the maturity data.

Outcome: The change in the model results in small changes in selectivity and stock status. The changes in context of stock status are negligible.

Terms of Reference for Spanish mackerel

1. Evaluate the quality and applicability of data used in the assessment.

The data used in this assessment were deemed by the Panel, and myself, as the best available given the current state of data collection. It is important to note that shrimp bycatch and the lack of information surrounding this avenue of removals is of major concern to the Panel and me. The lack of discard information, and in particular the lack of size/age at discarding, can be seen an issue that needs improvement.

Life history information was the strength for this particular assessment. The use of age varying natural mortality was a feature I thought useful for this particular stock. Further stock identification and growth were also important strengths in this assessment. However the identification, while sound, relied on very old techniques that should be updated in the near future. It's also very apparent that this stock is

wide ranging, and as such mixing between this stock and the Gulf of Mexico stock should be considered in the next study. Weaknesses were noted however. And it was clear that time varying weight, growth, and maturity could not be included due to a lack of requisite data.

Catch and landings were mixed for this stock. While commercial landings were available back to the 1950's, discard information was lacking, and samples sizes of observed trips were low. However, it should be noted that commercial discards are small. Recreational catch and discards were estimated from a combination of MRFSS and the newer Marine Recreational Information Program (MRIP) back until 1983. Again, as with Cobia, the calibration between these two methods of recreational estimates of catch is an important factor that needs more investigation.

Age and length data for the catch were not very well developed. Age data were very much lacking in this assessment with better age related data being collected most recently. However even the most recent data were sparse for an age-structured assessment, in my opinion. Further, the age at maturity data, as mentioned above were also sparse. And discards by age were unavailable and reconstructed based on observed landings. The most profound effect of missing age data was on selectivity. With the recent Florida net ban it is clear that selectivity in this fishery is changing. Yet age sampling data by the different fleets used in this model were lacking.

Indices of abundance were better for Spanish mackerel than for Cobia. In this assessment, Spanish mackerel benefited from two fishery dependent and one fishery independent index. All indices were standardized using conventional statistical analyses (e.g., delta-GLM with bootstrapping), and the assessment results (e.g., stock status) are relatively robust to the relative weighting of indices. However, catchablity assumptions, particularly for the recreational CPUE indices, were more problematic. The assumption was that catchablity is linearly related, which may not be true given the non-targeting nature of the recreational fishery. Linearity also doesn't account for changes in technology or regulatory changes.

2. Evaluate the quality and applicability of methods used to assess the stock.

The assessment team brought forth two analytical models during the Review Workshop. The Beaufort Assessment Model (BAM) and a surplus production model (ASPIC). Of the two, the Panel concluded, and I agreed, that the BAM was the more appropriate method despite some difficulties in the age data. However, it should be clearly understood that both models produced similar results, lending credence to the findings of stock status. While the ASPIC model seems more precise, this is actually a false perception. The BAM model produced more variability, which I found more realistic. In many cases the boot-strap methodology utilized in ASPIC underestimates the true variability and uncertainty in my opinion.

The Panel supported sex specific modeling as presented by the assessment team. However, given its treatment and the small impact of sex-specific differences (i.e. growth), the Panel was not certain that it was a useful addition; and it further complicates the model by adding in parameters. Future

benchmarks should re-examine the need to model the sexes in the stock separately; and if so re-examine the treatment of sex-specific growth and its impact on selectivity.

3. *Evaluate the assessment with respect to the following:*
    - *Is the stock overfished? What information helps you reach this conclusion?*
    - *Is the stock undergoing overfishing? What information helps you reach this conclusion?*
    - *Is there an informative stock recruitment relationship? Is the stock recruitment curve reliable and useful for evaluation of productivity and future stock conditions?*
    - *Are quantitative estimates of the status determination criteria for this stock reliable? If not, are there other indicators that may be used to inform managers about stock trends and condition?*

The Review Panel and I agreed that there was a low probability that the stock was overfished and that overfishing was occurring. The multitude of sensitivity analyses and the overall uncertainty bounds helped us reach this conclusion. Further the results of the ASPIC model also indicated that the stock was not depleted.

Recruitment in this stock has been moderate over the past few years. Overall, the stock-recruitment relationship was uncertain, but there was no indication that the stock was undergoing substantially reduced recruitment due to stock depletion or environmental factors. As such the recruitment was certain enough that managers could base decisions on using an MSY-type approach. It is important to remember however that steepness is not well estimated in this model, and uncertainties in that MSY-based approach should be accounted for.

Overall the BAM and the data used were the best available. Given that, and with the Help of Steve Cadrin and Marcel Reichert the Panel was able to give the following advice to the SCC and managers:

- For P*'s using SAFMC tiered approach, applying additive penalties to P*=0.5: Spanish mackerel (P*=0.425=0.5-0.075)
- Assessment Information – Tier 1: Quantitative assessment provides estimates of exploitation and biomass; includes MSY-derived benchmarks. (P*penalty=0; steepness was freely estimated)
- Uncertainty – Tier 2: High. This tier represents those assessments that include re-sampling (e.g. Bootstrap or Monte Carlo techniques) of important or critical inputs such as natural mortality, landings, discard rates, age and growth parameters. Such re-sampling is also carried forward and combined with recruitment uncertainty for projections and reference point calculations, including reference point distributions. The key determinant for this level is that reference point estimates distributions reflect more than just uncertainty in future recruitment. (P*penalty=-0.025)
- Stock Status – Tier 1: Neither overfished nor overfishing, and stock is at high biomass and low exploitation relative to benchmark values. (P*penalty=0)

- Productivity-Susceptibility Analysis – Tier 2: Moderate Risk. Moderate productivity, vulnerability, susceptibility, score 2.64-3.181 (P*penalty=-0.05; PSA score=2.74, MRAG 2009)

4. *Evaluate the adequacy, appropriateness, and application of the methods used to project future population status with regard to accepted practices and data available for this assessment.*

The methods used for projection were adequate and appropriate. I found that a major source of uncertainties in the projections derived from steepness. As these were fully analyzed using sensitivity analyses, the uncertainties in the projections are well captured. This uncertainty however should be recognized, particularly if long term projections are used as a basis for management.

5. *If there are significant changes to the base model, or to the choice of alternate states of nature, then provide a probability distribution function for the base model, or a combination of models that represent alternate states of nature, presented for review. Provide justification for the weightings used in producing the combinations of models.*

The Review Panel and I did not recommend any changes to the base model as presented, although a number of alternative sensitivity analyses were requested to examine model behavior (see below).

6. *Consider how uncertainties in the assessment, and their potential consequences, have been addressed.*
    - *Comment on the degree to which methods used to evaluate uncertainty reflect and capture the significant sources of uncertainty.*
    - *Ensure that the implications of uncertainty in technical conclusions are clearly stated.*

Uncertainty was considered and analyzed using two separate methods in this assessment. First, MCMC was used to examine variability in the input parameters. Additionally sensitivity runs were conducted to examine the potential for stable states of nature and to explore the model's sensitivity. These included changes to natural mortality, steepness, discard assumptions, indices, stocking, fecundity, changes in the likelihood weighting, and examination of catchablity in the survey indices.

Some concerns were raised by other Panel members that the natural mortality used in the MCMC was drawn from a very wide range, giving the appearance of more uncertainty than appropriate. We agreed that the methods and sensitivities chosen were appropriate, but we also requested additional runs for this stock to explore potential alternate states of nature.

Overall uncertainty was well captured in this assessment, but as always the true nature of uncertainty is in part based on the model and dynamics chosen. While best practices were followed, a note of caution is always warranted, that the true underlying uncertainty may never be fully captured by any analytical assessment.

7. *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, and information provided by, future assessments.*

Given the difficulties encountered in the life-history section of the assessment, the Review Panel and I suggest more detailed work on stock structure. Currently the genetic analysis used to define this stock is quite old and based on more primitive techniques than are currently available. As such we recommended an update to these genetic studies using more recent methodologies.

Additionally more work is needed on the collection of age and length samples; particularly in the shrimp fishery as this is an important component of removals as bycatch or discards. Further work by at-sea observers may be needed to quantify this removal source and to examine the age and size structure of those discard losses.

Some further work could also be devoted to examination of the stock-recruitment relationship; in particular steepness. However such studies are usually expensive in nature and may not yield tangible results after data collection. Still, such studies, in my opinion could help in giving another picture of recruitment especially in the face of changing environmental conditions.

Additional Model Runs and Sensitivities Requested by the Panel

1. Examine aggregate selectivity over time

Rational: It was noted that modeling the fishery required separate selectivity models by fleet and that the age sampling was relatively sparse. The combined catch at age matrix might be more precise than the combined fisheries. Examination of changes with time would inform the decisions on use of separate or combined fleets.
Outcome: The modeled selectivity at age suggests a change in the fishery following the Florida net ban and has resulted in substantial change in selectivity from the 1990s onwards. The selection at age is still changing by year due to changes in proportions of catch among different gear categories. Overall the model was only moderately sensitive to selectivity.

2. Examination of priors on selectivity functions

Rational: It was noted that modeling the fishery resulted in some rather rapid change of selection at age particularly for pound-net and recreational fisheries. These steep sided dome shaped functions are thought to be the result of age dependent spatial interactions and not gear related technical interactions. The selection patterns also exhibit correlation in the residuals at age among years. The examination was conducted in order to better understand the plots of model fit, prior probability, parameter bounds and fitted ML values.

Outcome: The comparison of priors and fitted values showed that none were at the parameter bounds, though the gillnet L50 was close to the limit. The Pound net L50 and Rec L50 were close to the mean values of their priors and could be checked for sensitivity to the assumed priors.

Final Thoughts, SEDAR process and suggestions

The Review Workshop was held In Atlanta, Georgia, at the Doubletree Hotel in Buckhead. It was an interesting place, with lots of hotel construction and other such inconveniences. Perhaps the most interesting part was that concurrent storm that was plaguing the East Coast at the time. This delayed one reviewer (Steve Cadrin) and occupied some of my thoughts as my family was in Massachusetts and Maine.

The process itself was also rather interesting. I did not receive the TOR or the contract until very late in the process and much later than normal. This is of course understandable as both Cobia and Spanish mackerel in the Gulf were removed from the Review workshop just prior to the meeting.

After observing both the assessment workshop and the Review workshop, I have to again impart my admiration to the staff and especially the assessment team for all of their hard work. It was clear that by the end of the Assessment workshop, much work was needed in order to complete these assessments. Clearly the Gulf assessment team simply wasn't able to complete the task, given the lateness of the data during the Assessment Workshop.

More time with the data, however, would not have helped this assessment team to be more thorough, as the work they produced was well more than adequate. In fact I have seen other assessment teams with more time that were not as meticulous and thorough as this team. But, clearly the process was hurried, and may have caused some undue stress on both assessment team and staff. Additionally, after reviewing the webinar files, it was clear that meeting remotely was not the most efficient way to conduct a series of assessment working meetings. Had a full workshop been convened, or had the data been available at the initial workshop, the removal of the Gulf stocks may have happened earlier in the process; allowing for other stocks to take their place.

The removal of the Gulf stock was unexpected for most reviewers with the exception of myself, who had gone over the audio files of the assessment webinars. Further, the removal of the Gulf of Mexico stocks, allowed the Review Panel to spend more time crafting the report, coming to consensus, and allowed the SSC members to fully provide advice to management.

Most of the other CIE reviewers indicated that having only two stocks to review was a fairly light workload. I am unconvinced. The Gulf stock assessments at the end of the assessment workshop, as well as the webinars, were not complete. As such, had they gone forward, the Review Panel would have spent the majority of their time reviewing the Gulf stocks, with little time available for the South Atlantic

stocks. Having communicated that point, even I found the workload lighter than other assessments I have reviewed.

The addition of SSC members as Chair and as a full reviewer was a great asset. Because of their familiarity with both the stocks and the process, they were instrumental in answering questions and reminding the CIE reviewers of how the assessments are used to craft management advice.

I have a number of suggestions for the process that some might find useful:

1. Ensure that data are on time for the Assessment Workshop, and delay the in-person meeting if there are substantial delays with the data. The Assessment workshop seemed relatively in-efficient in the use of time without the data being present.
2. If some stocks are not complete and/or ready for review, early detection can only help.
3. The use of webinars, while feasible and seemingly inexpensive, cannot replace in-person meetings. Much time and expense could have been saved had the Gulf of Mexico stocks been removed sooner.
4. Allow flexibility with CIE contracts to shorten the review workshop and, if needed, the length of the contract and compensation received. Reviewing only two stocks that were fairly thoroughly complete allowed for a lot of free time at the review workshop. This seemed somewhat inefficient given the cost of the meeting. An alternative would have been to bring existing information on the Spanish Mackerel and Cobia from the Gulf of Mexico, and allow us to comment on it informally to provide direction.

Appendix 1: Bibliography of materials provided for review

Document #	Title	Authors
Documents Prepared for the Data Workshop		
SEDAR28-DW01	Cobia preliminary data analyses – US Atlantic and GOM genetic population structure	Darden 2012
SEDAR28-DW02	South Carolina experimental stocking of cobia *Rachycentron canadum*	Denson 2012
SEDAR28-DW03	Spanish Mackerel and Cobia Abundance Indices from SEAMAP Groundfish Surveys in the Northern Gulf of Mexico	Pollack and Ingram, 2012
SEDAR28-DW04	Calculated discards of Spanish mackerel and cobia from commercial fishing vessels in the Gulf of Mexico and US South Atlantic	K. McCarthy
SEDAR28-DW05	Evaluation of cobia movement and distribution using tagging data from the Gulf of Mexico and South Atlantic coast of the United States	M. Perkinson and M. Denson 2012
SEDAR28-DW06	Methods for Estimating Shrimp Bycatch of Gulf of Mexico Spanish Mackerel and Cobia	B. Linton 2012
SEDAR28-DW07	Size Frequency Distribution of Spanish Mackerel from Dockside Sampling of Recreational and Commercial Landings in the Gulf of Mexico 1981-2011	N.Cummings, J. Isely
SEDAR28-DW08	Size Frequency Distribution of Cobia from Dockside Sampling of Recreational and Commercial Landings in the Gulf of Mexico 1986-2011	J. Isely and N. Cummings
SEDAR28-DW09	Texas Parks and Wildlife Catch Per unit of Effort Abundance Information for Spanish mackerel	N. Cummings, J. Isely
SEDAR28-DW10	Texas Parks and Wildlife Catch Per unit of Effort Abundance Information for cobia	J. Isely, N. Cummings
SEDAR28-DW11	Size Frequency Distribution of Cobia and Spanish Mackerel from the	J Isely and N Cummings

	Galveston, Texas, Reef Fish Observer Program 2006-2011	
SEDAR28-DW12	Estimated conversion factors for calibrating MRFSS charterboat landings and effort estimates for the South Atlantic and Gulf of Mexico in 1981-1985 with For Hire Survey estimates with application to Spanish mackerel and cobia landings	V. Matter, N Cummings, J Isely, K Brennen, and K Fitzpatrick
SEDAR28-DW13	Constituent based tagging of cobia in the Atlantic and Gulf of Mexico.	E. Orbesen
SEDAR28-DW14	Recreational Survey Data for Spanish Mackerel and Cobia in the Atlantic and the Gulf of Mexico from the MRFSS and TPWD Surveys	V. Matter
SEDAR28-DW15	Commercial Vertical Line and Gillnet Vessel Standardized Catch Rates of Spanish Mackerel in the US Gulf of Mexico, 1998-2010	N. Baertlein, K. McCarthy
SEDAR28-DW16	Commercial Vertical Line Vessel Standardized Catch Rates of Cobia in the US Gulf of Mexico, 1993-2010	K. McCarthy
SEDAR28-DW17	Standardized Catch Rates of Spanish Mackerel from Commercial Handline, Trolling and Gillnet Fishing Vessels in the US South Atlantic, 19982010	K. McCarthy
SEDAR28-DW18	Standardized catch rates of cobia from commercial handline and trolling fishing vessels in the US South Atlantic, 1993-2010	K. McCarthy
SEDAR28-DW19	MRFSS Index for Atlantic Spanish mackerel and cobia	Drew et al.
SEDAR28-DW20	Preliminary standardized catch rates of Southeast US Atlantic cobia (Rachycentron canadum) from headboat data.	NMFS Beaufort
SEDAR28-DW21	Spanish mackerel preliminary data summary: SEAMAP-SA Coastal Survey	Boylan and Webster
SEDAR28-DW22	Recreational indices for cobia and Spanish mackerel in the Gulf of Mexico	Bryan and Saul
SEDAR28-DW23	A review of Gulf of Mexico and Atlantic	Palmer, DeVries, and

	Spanish mackerel (Scomberomorus maculatus) age data, 1987-2011, from the Panama City Laboratory, Southeast Fisheries Science Center, NOAA Fisheries Service	Fioramonti
SEDAR28-DW24	SCDNR Charterboat Logbook Program Data, 1993 - 2010	Errigo, Hiltz, and Byrd
SEDAR28-DW25	South Carolina Department of Natural Resources State Finfish Survey (SFS)	Hiltz and Byrd
SEDAR28-DW26	Cobia bycatch on the VIMS elasmobranch longline survey:1989-2011	Parsons et al.

Documents Prepared for the Assessment Workshop

SEDAR28-AW01	Florida Trip Tickets	S. Brown
SEDAR28-AW02	SEDAR 28 Spanish mackerel bycatch estimates from US Atlantic coast shrimp trawls	NMFS Beaufort

Documents Prepared for the Review Workshop

SEDAR28-RW02	The Beaufort Assessment Model (BAM) with application to cobia: mathematical description, implementation details, and computer code	Craig
SEDAR28-RW03	The Beaufort Assessment Model (BAM) with application to Spanish mackerel: mathematical description, implementation details, and computer code	Andrews

Reference Documents

SEDAR28-RD01	List of documents and working papers for SEDAR 17 (South Atlantic Spanish mackerel) – all documents available on the SEDAR website	SEDAR 17
SEDAR28-RD02	2003 Report of the mackerel Stock Assessment Panel	GMFMC and SAFMC, 2003
SEDAR28-RD03	Assessment of cobia, *Rachycentron canadum*, in the	Williams, 2001

	waters of the U.S. Gulf of Mexico	
SEDAR28-RD04	Biological-statistical census of the species entering fisheries in the Cape Canaveral area	Anderson and Gehringer, 1965
SEDAR28-RD05	A survey of offshore fishing in Florida	Moe 1963
SEDAR28-RD06	Age, growth, maturity, and spawning of Spanish mackerel, *Scomberomorus maculates* (Mitchill),	Schmidt et al. 1993

Appendix 2: A copy of the CIE Statement of Work

Attachment A: Statement of Work for Dr. Matthew Cieri

External Independent Peer Review by the Center for Independent Experts

SEDAR 28 South Atlantic Spanish mackerel and cobia assessment review

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.org.

Project Description SEDAR 28 will be a compilation of data, an assessment of the stocks, and an assessment review conducted for South Atlantic Spanish mackerel and cobia. The CIE peer review panel is ultimately responsible for ensuring that the best possible assessment has been provided through the SEDAR process. The stocks assessed through SEDAR 28 are within the jurisdiction of the South Atlantic Fisheries Management Councils and states of Florida, Georgia, South Carolina, and North Carolina. The Terms of Reference (ToRs) of the peer review are attached in **Annex 2**. The agenda of the panel review meeting will be attached in **Annex 3**.

Requirements for CIE Reviewers: Three CIE reviewers shall conduct an impartial and independent peer review during the SEDAR 28 review scheduled in 29 October - 2 November 2012, and the CIE reviewers shall have the necessary qualifications to complete the tasks in accordance with the SoW and ToRs herein. *One of the selected CIE reviewers will be the CIE observer contracted to attend the SEDAR 28 assessment workshop in May 2012.* The CIE reviewers shall have expertise in stock assessment, statistics, fisheries science, and marine biology sufficient to complete the tasks of the peer-review described herein. 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 participate and conduct an independent peer review during the panel review meeting scheduled in Atlanta, Georgia during October 29 through November 2, 2012.

Statement of Tasks: Each CIE reviewer 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/ http://deemedexports.noaa.gov/compliance_access_control_procedures/noaa-foreign-national-registration-system.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.

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 shall 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. *One of the selected CIE reviewers will be the CIE observer contracted to attend the SEDAR 28 assessment workshop in May 2012, and the CIE observer's report will be reviewed and distributed as an addendum to the final independent CIE peer review report for that CIE reviewer.*

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. The Summary Report is not reviewed by the CIE, therefore is not a CIE product. 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 at the Atlanta, Georgia during October 29 through November 2, 2012.
3) In Atlanta, Georgia during October 29 through November 2, 2012 as specified herein, conduct an independent peer review in accordance with the ToRs (**Annex 2**).
4) No later than November 16, 2012, 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 CIE Regional Coordinator, via email to Dr. David Sampson 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.

21 September 2012	CIE sends reviewer contact information to the COTR, who then sends this to the NMFS Project Contact
15 October 2012	NMFS Project Contact sends the CIE Reviewers the pre-review documents

29 October – 2 November 2012	Each reviewer participates and conducts an independent peer review during the panel review meeting
16 November 2012	CIE reviewers submit draft CIE independent peer review reports to the CIE Lead Coordinator and CIE Regional Coordinator
30 November 2012	CIE submits CIE independent peer review reports to the COTR
7 December 2012	The COTR distributes the final CIE reports to the NMFS Project Contact and regional Center Director

Modifications to the Statement of Work: This 'Time and Materials' task order may require an update or modification due to possible changes to the terms of reference or schedule of milestones resulting from the fishery management decision process of the NOAA Leadership, Fishery Management Council, and Council's SSC advisory committee. A request to modify this SoW must be approved by the Contracting Officer at least 15 working days prior to making any permanent changes. The Contracting Officer will notify the COTR within 10 working days after receipt of all required information of the decision on changes. 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) The CIE report shall completed with the format and content in accordance with **Annex 1**,
(2) The 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.

Support Personnel:

William Michaels, Program Manager, COTR
NMFS Office of Science and Technology

1315 East West Hwy, SSMC3, F/ST4, Silver Spring, MD 20910
William.Michaels@noaa.gov Phone: 301-427-8155

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

Roger W. Peretti, Executive Vice President
Northern Taiga Ventures, Inc. (NTVI)
22375 Broderick Drive, Suite 215, Sterling, VA 20166
RPerretti@ntvifederal.com Phone: 571-223-7717

Key Personnel:

NMFS Project Contact:

Ryan Rindone, SEDAR Coordinator
2203 N. Lois Avenue, Suite 1100
Tampa, FL 33607
Ryan.Rindone@gulfcouncil.org Phone: 813-348-1630

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.

SEDAR 28: South Atlantic Cobia and Spanish Mackerel
Review Workshop Terms of Reference

5. Evaluate the quality and applicability of data used in the assessment.
6. Evaluate the quality and applicability of methods used to assess the stock.
7. Evaluate the assessment with respect to the following:

- Is the stock overfished? What information helps you reach this conclusion?
- Is the stock undergoing overfishing? What information helps you reach this conclusion?
- Is there an informative stock recruitment relationship? Is the stock recruitment curve reliable and useful for evaluation of productivity and future stock conditions?
- Are quantitative estimates of the status determination criteria for this stock reliable? If not, are there other indicators that may be used to inform managers about stock trends and condition?

4. Evaluate the adequacy, appropriateness, and application of the methods used to project future population status with regard to accepted practices and data available for this assessment.
5. If there are significant changes to the base model, or to the choice of alternate states of nature, then provide a probability distribution function for the base model, or a combination of models that represent alternate states of nature, presented for review. Provide justification for the weightings used in producing the combinations of models.
6. Consider how uncertainties in the assessment, and their potential consequences, have been addressed.
   - Comment on the degree to which methods used to evaluate uncertainty reflect and capture the significant sources of uncertainty.
   - Ensure that the implications of uncertainty in technical conclusions are clearly stated.
7. 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, and information provided by, future assessments.

8. 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 Peer Review Summary Report in accordance with the project guidelines.
    - 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.

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

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

Annex 3: Agenda for the SEDAR 28 Review

Atlanta, GA - October 29 through November 2, 2012

Monday		
1:00 p.m.	**Convene**	
1:00 – 1:30	**Introductions and Opening Remarks** *- Agenda Review, TOR, Task Assignments*	**Coordinator**
1:30 – 5:00	**Assessment Presentations and Discussions**	**TBD**
5:00 p.m. - 6:00 p.m.	**Panel Work Session**	**Chair**
Tuesday		
8:00 a.m. – 11:30 a.m.	**Assessment Presentations**	**TBD**
11:30 a.m. – 1:00 p.m.	**Lunch Break**	
1:00 p.m. – 3:30 p.m.	**Panel Discussion** *- Assessment Data & Methods* *- Identify additional analyses, sensitivities, corrections*	**Chair**
3:30 p.m. – 3:45 p.m.	**Break**	
3:45 p.m. – 5:00 p.m.	**Panel Discussion** *- Continue deliberations* *- Review additional analyses*	**Chair**
5:00 p.m. - 6:00 p.m.	**Panel Work Session**	**Chair**

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

Wednesday		
8:00 a.m. – 11:30 a.m.	**Panel Discussion** *- Review additional analyses, sensitivities* *- Consensus recommendations and comments*	**Chair**
11:30 a.m. – 1:00 p.m.	**Lunch Break**	
1:00 p.m. – 3:30 p.m.	**Panel Discussion**	**Chair**
3:30 p.m. – 3:45 p.m.	**Break**	
3:45 p.m. – 5:00 p.m.	**Panel Discussion**	**Chair**
5:00 p.m. - 6:00 p.m.	**Panel Work Session**	**Chair**

Wednesday Goals: Final sensitivities identified, preferred models selected, projection approaches approved, Summary report drafts begun

Thursday		
8:00 a.m. – 11:30 a.m.	**Panel Discussion** *- Final sensitivities reviewed.* *- Projections reviewed.*	**Chair**
11:30 a.m. – 1:00 p.m.	**Lunch Break**	
1:00 p.m. – 3:30 p.m.	**Panel Discussion or Work Session**	**Chair**
3:30 p.m. - 3:45 p.m.	**Break**	
3:45 p.m. - 6:00 p.m.	**Panel Work Session** *- Review Consensus Reports*	**Chair**

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

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

Appendix 3: Panel Membership or other pertinent information from the panel review meeting.

SEDAR 28
Gulf of Mexico and South Atlantic
Spanish Mackerel and Cobia
10-11-12

Data Workshop Participants

GC – Gulf of Mexico Cobia GSM – Gulf of Mexico Spanish Mackerel

SAC – S. Atlantic Cobia SASM – S. Atlantic Spanish Mackerel *Workshop Panel*

Analytical Team

- Katie Andrews Lead Analyst SASM NMFS Beaufort
- Kevin Craig Lead Analyst SAC NMFS Beaufort
- Nancie Cummings Lead Analyst GSM NMFS Miami
- Jeff Isely Lead Analyst GC NMFS Miami
- Meaghan Bryan Data compiler GC, GSM NMFS Miami
- Rob Cheshire Data compiler SASM NMFS Beaufort
- Eric Fitzpatrick Data compiler SAC NMFS Beaufort

Life History Workgroup

- Jennifer Potts *Workgroup leader, SA* NMFS Beaufort
- Doug Devries *Workgroup leader, GC* NMFS Panama City
- Chris Palmer *Workgroup leader, GSM* NMFS Panama City
- Karl Brenkert SAC data SC DNR
- Chip Collier Data provider SA SSC
- Tanya Darden SAC data SC DNR
- Mike Denson SAC data SC DNR
- Jim Franks GC data USM
- Randy Gregory Data provider NC DMF
- Read Hendon Data provider USM
- Chris Kalinowski SAC data GA DNR
- Tom Ogle AP, Recreational SC
- Bill Parker Charter SC
- Ernst Peebles Data provider USF
- Matt Perkinson SAC data SC DNR
- Marcel Reichert Data provider SA SSC
- Joe Smith Data provider NMFS Beaufort
- John Ward Gulf socioeconomics Gulf SSC
- Erik Williams Data provider NMFS Beaufort
- Justin Yost SAC data SC DNR

Commercial Workgroup

- Kyle Shertzer *Workgroup leader, SA* NMFS Beaufort
- Dave Gloeckner *Workgroup leader, Gulf* NMFS Miami
- Neil Baertlein Data provider NMFS Miami
- Donna Bellais Data provider GSMFC
- Steve Brown Data provider FL FWC
- Julie Califf* Data provider GA DNR
- Joe Cimino Data provider VMRC
- Julie Defilippi Data provider ACCSP
- Tim Sartwell Data provider ACCSP
- Amy Dukes Data provider SC DNR
- Dave Donaldson* Data provider GSMFC
- Rusty Hudson AP, comm. and rec. FL
- Stephanie McInerny Data provider NC DMF
- Alan Bianchi* Data provider NC DMF
- Liz Scott-Denton Data provider NMFS Galveston
- Refik Orhun Data provider NMFS Miami
- Kevin McCarthy Data provider NMFS Miami

Recreational Workgroup

- Ken Brennan *Workgroup leader, SA* NMFS Beaufort
- Vivian Matter *Workgroup leader, Gulf* NMFS
- Julia Byrd Data provider SC DNR
- Kelly Fitzpatrick Data provider NMFS Beaufort
- Robert Johnson AP, Charter FL
- Doug Mumford* Data provider NC DMF
- Bob Pelosi AP, Recreational FL
- Bob Zales II AP, Charter FL
- Mike Nugent AP, Charter TX
- Beverly Sauls* Data provider FL FWC

Indices Workgroup

- Amy Schueller *Workgroup leader, SA* NMFS Beaufort
- Walter Ingram *Workgroup leader, Gulf* NMFS Pascagoula
- Jeanne Boylan SASM data SC DNR
- Shannon Calay Gulf data NMFS Miami
- Lew Coggins Data provider NMFS Beaufort
- Pearse Webster SASM data SC DNR

Council Representation

- Ben Hartig Council Rep SAFMC

Staff

- Kari Fenske SEDAR 28 Coordinator SEDAR
- Ryan Rindone Coordinator SEDAR
- Rachael Silvas Administrative support SEDAR
- Tyree Davis IT support SEFSC Miami

- Mike Errigo SAFMC
- Gregg Waugh SAFMC
- Appointees marked with an * are appointed to the workshop panel as noted but are not expected to attend the workshop. They will provide data and review use of the data provided, and be available via email or phone for questions as needed.
- Assessment Workshop Participants

Workshop Panel

- Katie Andrews Lead Analyst SASM NMFS Beaufort
- Kevin Craig Lead Analyst SAC NMFS Beaufort
- Nancie Cummings Lead Analyst GSM NMFS Miami
- Jeff Isely Lead Analyst GC NMFS Miami
- Meaghan Bryan Data compiler GSM, GC NMFS Miami
- Rob Cheshire Data compiler SASM NMFS Beaufort
- Eric Fitzpatrick Data compiler SAC NMFS Beaufort
- Michael Schirripa NMFS Miami
- Mike Denson SC DNR
- Read Hendon* Gulf SSC
- Marcel Reichert SA SSC
- Scott Crosson SA SSC
- Bob Muller FL FWRI
- Clay Porch NMFS Miami
- Joe Powers Gulf SSC
- Sean Powers Gulf SSC
- Greg Stunz Gulf SSC
- John Walter NMFS Miami
- John Ward Gulf SSC
- Erik Williams NMFS Beaufort

Council Representation

- Ben Hartig Council Rep SAFMC

CIE Observers

- Matt Cieri CIE

Observers

- Rusty Hudson AP, comm. and rec. FL
- Tom Ogle AP, recreational FL
- Bill Parker Commercial charter SC

Staff

- Kari Fenske SEDAR 28 Coordinator SEDAR
- Ryan Rindone Coordinator SEDAR
- Patrick Davis IT support SEFSC
- Julie O'Dell Administrative Support SAFMC/SEDAR
- Mike Errigo SAFMC
- Sue Gerhart SERO

- Jack McGovern SERO
- Andy Strelcheck SERO
- Gregg Waugh SAFMC
- Mike Larkin SERO

***** Appointees marked with an * are appointed to the workshop panel as noted but are not expected to attend the workshop. They will provide data and review use of the data provided, and be available via email or phone for questions as needed.

Review Workshop Panel

- Luiz Barbieri Review Panel Chair Gulf and SA SSC
- Steve Cadrin Reviewer SA SSC
- Matt Cieri Reviewer CIE
- Mark Dickey-Collas Reviewer CIE
- John Simmonds Reviewer CIE

Assessment Workshop Representatives

- Katie Andrews Lead Analyst SASM NMFS Beaufort
- Kevin Craig Lead Analyst SAC NMFS Beaufort
- Kyle Shertzer NMFS Beaufort
- Erik Williams NMFS Beaufort

Council Representation

- Ben Hartig Council Rep SAFMC

Staff

- Ryan Rindone SEDAR 28 RW Coordinator SEDAR
- Julia Byrd SEDAR Coordinator SEDAR
- Andrea Grabman Administrative Support SEDAR
- Mike Errigo SAFMC
- Sue Gerhart SERO
- Jack McGovern SERO
- Andy Strelcheck SERO
- Mike Larkin SERO
- Gregg Waugh SAFMC

Definitions

GC – Gulf of Mexico cobia
GMFMC – Gulf of Mexico Fishery Management Council
GSM – Gulf of Mexico Spanish mackerel
GSMFC – Gulf States Marine Fisheries Commission
NC DMF – North Carolina Division of Marine Fisheries
NMFS – National Marine Fisheries Service
SAC – South Atlantic cobia
SAFMC – South Atlantic Fishery Management Council
SASM – South Atlantic Spanish mackerel
SA – South Atlantic

SC DNR – South Carolina Department of Natural Resources
SERO – Southeast Regional Office
SSC – Science and Statistics Committee
USF – University of South Florida
USM – University of Southern Mississippi
VIMS – Virginia Institute of Marine Science