Report on the 66th North East Regional Stock Assessment Review Committee (SARC)

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An active vessel from the discard fleet

Contents

Executive Summary

1. Stock assessments of summer flounder and striped bass were reviewed by a panel of three CIE reviewers and chaired by Dr Rob Latour in Woods Hole, MA from 27-30 December 2018. Draft stock assessment reports were available approximately one week prior to the review. The panel discussed aspects of the assessment with assessment leaders and indicated changes to the stock summary reports.

Summer Flounder

2. Catch data were available from the commercial and recreational fisheries and included discards. A large number of state and federal surveys were included in the assessment. Commercial LPUE indices were investigated but not used in the assessment and this appears to be appropriate.
3. Catch at age analysis was performed using the ASAP model. Comprehensive diagnostics of model fit and uncertainty are provided. The assessment provides a robust summary of stock trends. The split of the catch data into landings and discard "fleets" by the assessment working group was considered artificial and it would be preferable to split catches by true fleet.
4. Sexually dimorphic growth was investigated in supporting assessment models but these were not considered to be ready for use in management advice.
5. Biological reference points based on the current F35% criterion were calculated. Based on these proxies, the stock is not overfished and overfishing is not occurring. This is consistent with previous analyses.
6. Projections are provided based on ASAP assessment. Considerable care is necessary in the interpretation of the probability statements that relate to exceeding reference points as they are conditioned on the assumption that reference points are fixed and known without error. The projections are based on close-to-status quo conditions and should be fairly robust and hence provide an adequate basis for management.
7. Progress on research recommendations is provided by the working group and shows more progress on some areas than others. Some thought should be given to developing a more coherent research plan.

Striped Bass

1. Available survey data comprise surveys of the whole stock area from the MRIP survey and a number of state surveys that typically cover a limited geographical area. These are listed and described. Catch at age data are available for both landings and discards. Tagging data were used to estimate natural mortality. It is believed M has been higher in Chesapeake Bay in recent years due to disease prevalence.
2. Catch at age analysis was performed using a new two stock SCA model. Comprehensive diagnostics of model fit and uncertainty were provided. However, the panel felt that this

assessment model required further testing before being used for management advice due to uncertainty about migration rates between Chesapeake Bay and the ocean. It was recommended that the former single stock SCA model be used for advice.

3. Analyses of tagging data are presented that suggest fishing mortality as estimated from these data are similar to the main assessment. However, the analysis suggests that while the overall estimates of Z are fairly robust, the partitioning of Z between F and M is sensitive to the assumption on tag reporting rates. An obvious further development of the assessment would be to include the tagging data in the SCA model.
4. Biological reference points for the two stock model were calculated but these were not supported by the panel. The working group had used the two stock model to redefine BRPs by stock and area. However, the panel regarded these as not biologically meaningful and recommended BRPs based on the single stock model and the SSB in 1995.
5. Catch projections were supplied but these need to be re-run with the single stock model.
6. The working group usefully classified research recommendations into three categories of priority. Some thought should be given to drawing on the research recommendations across the various stocks and developing a research plan that clearly identifies topics of highest priority.

General

8. Some of the reviewers' comments made for the same stocks at the SARC 57 review were not addressed by the assessment teams. This in part seems to be due to the absence of a formal mechanism to consider these comments. I would recommend that assessment teams are asked to respond to the points raised by reviewers to ensure they are properly considered and action taken where this is merited.

Background

The SARC66 review of summer flounder and striped bass assessments took place at Woods Hole, MA, from the 27rd -30th November as part of the SAW process. Background documents (peer reviewed and non-reviewed) were available approximately two weeks before the meeting and the respective stock assessment reports were made available one week before the review. During the two weeks before the meeting the reviewer considered these various materials which were available electronically. Particular attention was given to the two main assessment reports.

Shortly before the opening of the meeting on the 27th November, the reviewers and the chair of the panel (Dr Rob Latour) met with Dr James Weinberg (SAW chair) and Dr Russ Brown (Head of Population Dynamics Branch, NEFSC) to discuss the terms of reference and Statement of Work for the review. Dr Weinberg indicated that the purpose of the review was to establish whether or not the assessments provided an adequate basis for management advice.

During the meeting the reviewer discussed the assessments with the lead assessment scientists to seek clarification on a number of scientific and technical issues relating to the data, the stock and the fishery. The panel discussed and agreed changes to the stock assessment summary documents. Following the meeting the reviewer continued to correspond with the panel and SARC chair to finalize the SARC summary report and prepare the individual reviewer's report.

Summary of findings

Summer flounder

1) Estimate catch from all sources, *including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data. Compare previous recreational data to re-estimated Marine Recreational Information Program (MRIP) data (if available).*

The ToR was largely met.

Data were available from the recreational and commercial fisheries that comprise the main components. The commercial landings are the larger component and are regarded as having minimal error. They are calculated from official landings records at both state and federal level. Recreational catch data are estimated from the MRIP survey. In July 2018, the Marine Recreational Information Program (MRIP) replaced the existing estimates of recreational catch with a calibrated 1982-2017 time series. These estimates are consistent with new survey methods that have now been fully implemented. The methods used to revise the estimates have been peer reviewed and the catch data are regarded as the best available. The magnitude of the new recreational catch time series is more than three times the previously used series. Since the recreational catch is estimated from a survey, it will be subject to greater error than the

commercial catch. The very large upward revision of the catch is perhaps indicative of the uncertainty in the values.

Discard estimates for the commercial fishery were obtained from an observer program. Various methods were investigated to raise observer samples to fleet level. Raising factors based on the catch of all species by trip was considered to be the most robust approach. This is in line with published studies that show raising discard samples using auxiliary variables is more robust to the estimation of discarded quantities than simple ratio estimators.

Estimates of the recreational fishery discards were made from the MRIP surveys and used an estimate of release mortality to derive dead discards. The release mortality is low but uncertain. Since the estimate of release mortality is itself rather uncertain, it is possible that deriving dead discards simply adds noise to the assessment. In theory, including dead discards in the model should reduce bias, but this may be at the expense of a higher mean squared error in the estimated values from the model.

The spatial and temporal distributions of both the commercial and recreational fishery are presented. The former are based on vessel trip reports (VTR) showing the fishery is distributed both inshore and along the shelf edge. There are seasonal changes in the distributions as well as a longer trend for the fishery to move northward. The available data for the recreational fishery is restricted to party and charter vessels and is limited to inshore waters.

The Assessment Report does address some aspects of uncertainty. I would like to have seen an assessment of mis-reporting/recording errors in the commercial landings data and an elaboration of the sample error for the recreational catch. It would be useful to see recreational landings data presented as a mean and confidence interval based on the sample design, to get a minimum estimate of the uncertainty in this component of the data.

2) Present the survey data available*, and describe the basis for inclusion or exclusion of those data in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.). Investigate the utility of commercial or recreational LPUE as a measure of relative abundance. Characterize the uncertainty and any bias in these sources of data.*

The ToR was fully met.

Available survey data comprise surveys of the whole stock area performed by the NEFSC and a number of state surveys that typically cover a small geographical area. These are listed and described. CVs are provided for the abundance indices. Some of the abundance indices are aggregate measures while others are age structured or sample only the young of the year (YOY). For the NEFSC surveys an additional source of uncertainty arises from a change of vessel and sampling protocol in 2009. In order to preserve the time series, the more recent indices have been rescaled based on comparative fishing trials. The more recent abundance indices from this survey have also been raised to swept area estimates.

At the SARC 57, the working group had considered which surveys should be included in the assessment based on a set of agreed criteria. However, in the current assessment, it was decided to include all surveys and allow the model to weight the data based on internal and external measures of precision. The inclusion of all surveys does not appear to be detrimental to the assessment.

A number of fishery dependent LPUE indices were investigated as required by the ToR. Standardized indices were estimated by fitting GLMs to vessel trip records to extract a year effect. Overall, the working group concluded that these indices were not adequate for inclusion in the assessment. Given the well-known problems with abundance indices based on commercial fishery data this appears to be an appropriate conclusion, particularly since there are many fishery independent surveys that can be used to inform the assessment model and these should be preferred over indices based on fishery data.

3) Describe life history characteristics *and the stock's spatial distribution (for both juveniles and adults), including any changes over time. Describe factors related to productivity of the stock and any ecosystem factors influencing recruitment. If possible, integrate the results into the stock assessment.*

This ToR was fully met.

The working group considered a range of biological characteristics including, aging research, growth, length-weight relationships, condition factor, sex ratio, maturity and natural mortality. Of these, it is perhaps worth noting that size at age has declined recently and this has implications for the estimates of biological reference points. The sex ratio has converged toward 1:1 and maturity at age 1 has decreased. The reasons for these changes are not known, but it is likely the change in the sex ratio is related to reduced rates of exploitation.

The working group briefly considered the ecosystem context without reaching any specific conclusions. It is noted that recent recruitment has been poor but that no causal factor has been explicitly linked to this.

The NEFSC surveys cover the total stock distribution and this was used to investigate the stock spatial distribution. The center of distribution of the stock appears to be more northerly and easterly than in earlier years with larger fish generally found further north. There are many possible explanations for this change including reduced fishing pressure.

4) Estimate annual fishing mortality, recruitment and stock biomass *(both total and spawning stock) for the time series, and estimate their uncertainty. Include retrospective analyses (both historical and within-model) to allow a comparison with previous assessment results and projections, and to examine model fit. Examine sensitivity of model results to changes in re-estimated recreational data.*

This ToR was fully met and the assessment does provide an adequate basis for management advice.

An age structured statistical catch at age model (ASAP) was used to estimate population parameters. This is a likelihood-based statistical catch at age model that allows certain parameters to be constrained by penalty functions. The various data inputs can be weighted differently according to user preference. In general terms, this is a well-established approach that is widely used and can be considered appropriate for the assessment of the stock.

It is assumed that the proportions at age in the catch or survey data are described by a multinomial distribution with the total numbers being drawn from a separate lognormal distribution. One particular feature of this assumption is the problem of estimating the "effective sample size" (ESS) for the multinomial distribution and this can have a large effect in the estimated parameters. The assessment group used established methods due to Francis for estimating ESS.

The ASAP model allows catch data to be assigned to different fleets. In this assessment, the data were assigned to four "fleets". These comprised two landings fleets (commercial and recreational) and two similarly defined discard fleets. This classification to fleets does not describe the operation of true fleets since the commercial and recreational data are combined by catch type rather than fishery. It means the estimated selectivity values are not easily interpreted for management purposes as they are a compound of true selection by the vessel modified by any discarding behaviour. It would be more useful to estimate selectivity by true fleet (commercial or recreational) and estimate a separate catch retention ogive for each fishery since this would give a more direct measure of the impact each fishery has on each age group of fish. Modeling the commercial fleet and recreational fleets as true fleets would be a more natural way of partitioning the catch and would give meaningful values of fleet selectivity. While this issue is unlikely to affect the estimates of total fishing mortality by age, it is not particularly helpful if managers wished to investigate the effect of different technical measures on the two fisheries by, for example, changing the mesh size of commercial fishing gears. This issue was raised at the SARC 57 review but, disappointingly, was not addressed by the working group.

Sensitivity runs (for example, dropping area limited surveys) tended to affect the degree of "doming" in the selection pattern where more pronounced doming results in higher SSB estimates. This issue is important in view of the very artificial way selectivity is modeled in this assessment, as noted above, and is the cause of some concern.

The working group provided a very comprehensive and systematic approach to investigate the new four fleet model configuration and the updated data. These show the effect of the new configuration when analyzing the same data as the previous assessment and the incremental changes arising by introducing updated data. Overall the new assessment shows the same qualitative historical trends in F and SSB as the old model, but there are differences in scale driven to a large extent by the revised MRIP catch data but also the change to a four-fleet

configuration. The latter was justified by better model diagnostics than the two fleet model used previously.

Diagnostics from the model do not show major areas of concern. Model fits to the total catch and catch age compositions are generally good. Some state surveys are poorly fit but receive low weight in the likelihood. The retrospective analysis for recent years shows no strong pattern. When compared to previous assessments the base model exhibits a similar trend in F, and while the SSB trend is qualitatively similar, it is rescaled by the large revision to the MRIP data.

A likelihood profile was produced over a range of values for natural mortality. The profile indicates that a lower value than 0.25 as used in the assessment receives the highest support and perhaps indicates that this issue should be revisited. However, it is probably better to fix M than estimate it within the model, since is it often confounded with other parameters such as survey catchability.

In addition to the ASAP base model, a number of other assessment models were investigated by the working group. These were intended to explore population models differentiated by sex to account for growth differences and potentially differing mortality rates. The models considered were an ASAP two sex model, Stock Synthesis, Sex-At-Length (SAL) and a state-space model. These supporting models were not all fully developed at the time of the review, but produced stock trends (F and SSB) that were qualitatively similar but with differences in scale, especially in SSB. Direct comparison between the models is difficult because they were not necessarily configured in the same way and, apart from the catch data, did not include the same suite of surveys.

The sex differentiated models, while potentially more realistic, suffer from very limited data to apportion catch by sex. Most of the available data on sex comes from surveys, yet the assessment results are largely driven by the total catches where sexes are not identified. Clearly there will be a trade-off between model realism and information in the data and this will need to be investigated.

5) State the existing stock status definitions *for "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; point estimates or proxies for* B_{MSY}, $B_{THRESHOLD}$, F_{MSY} *and MSY) and provide estimates of their uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.*

This ToR was fully met.

The established BRPs for summer flounder are based on the MSY proxy of F35%. The Working Group proposed that the F35% based BRPs should be retained because there were no strong reasons to change. In order to calculate the BRPs, it is necessary to specify a model for recruitment and the working group considered three options:

a. Use of a Beverton-Holt stock-recruitment model
b. Median recruitment over the full time series
c. Median recruitment over a recent period of years

Option (a) was regarded as unreliable due to the difficulty in fitting the recruitment model with a realistic value of steepness. Option (c) has the advantage of reflecting the lower productivity currently observed. However, the working group proposed option (b) because, in the absence of an explanation for lower recruitment, the calculation of the BRP using a short time series may be misleading. While it is a matter of opinion, option (c) may be preferable since a lack of explanation for the recruitment change does not mean productivity is unaffected. It may have responded to an unknown ecosystem change.

The revised BRPs based on option (b) take into account changes to mean weight at age and a more domed selectivity pattern. The net result of these effects is that the new proposed BRPs show a higher Fmsy but lower SSBmsy compared with the SARC 57 values. The biomass reference points will be affected by the new MRIP data that rescale the assessment implying higher average recruitment and biomass over the observed time period of the assessment.

6) Make a recommendation about what stock status appears to be*, based on the existing model (i.e., model from previous peer reviewed accepted assessment) and with respect to a new modeling approach(-es) developed for this peer review.*

a. Update the existing model with new data and make a stock status recommendation (about overfished and overfishing) with respect to the existing BRP estimates.
b. Then use the newly proposed modeling approach(-es) and make a stock status recommendation with respect to "new" BRPs and their estimates (from TOR-5).
c. Include descriptions of stock status based on simple indicators/metrics (e.g., age- and size-structure, temporal trends in population size or recruitment indices, etc).

The TOR was met.

The assessment report documents runs with the old model configuration but using updated data and also provides full analysis of the new model and its outputs. Based on the F35% MSY proxies, the stock is not overfished and overfishing is not occurring, and this is consistent with previous analyses. The assessment of current stock status in relation to these reference points appears to be robust.

Regarding ToR 6c, the working group notes the change to an expanded age structure suggesting lower F, but declining indices of abundance and recruitment in recent years. With lower recent recruitment, this implies the level of F will not support an increase in biomass.

7) Develop approaches and apply them to conduct stock projections.

a. Provide numerical annual projections (5 years) and the statistical distribution (i.e., probability density function) of the catch at F_{MSY} or an F_{MSY} proxy (i.e. the overfishing level, OFL) (see Appendix to the SAW TORs). Each projection should estimate and report annual probabilities of

exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach in which a range of assumptions about the most important uncertainties in the assessment are considered (e.g., terminal year abundance, variability in recruitment).

b. *Comment on which projections seem most realistic. Consider the major uncertainties in the assessment as well as sensitivity of the projections to various assumptions. Identify reasonable projection parameters (recruitment, weight-at-age, retrospective adjustments, etc.) to use when setting specifications.*

c. *Describe this stock's vulnerability (see "Appendix to the SAW TORs") to becoming overfished, and how this could affect the choice of ABC.*

The ToR was met.

Stochastic projections are provided based on alternative assumptions about median recruitment. Projections are also shown for the alternative BRPs (short recruitment series). The projections are examples only as the catch assumption for 2018 is conditioned on the old MRIP estimates and will need to be revised. The working group considered the stock to have low vulnerability to being overfished given the current estimates of stock biomass and fishing mortality.

Considerable care is necessary in the interpretation of the probability statements that relate to exceeding reference points. These statements are conditioned on the assumption that reference points are fixed and known without error. In reality they can only be estimated with error so the calculated probabilities do not take into account the uncertainty in the reference points themselves. This may be important in the light of sexually dimorphic growth, which is not explicitly accounted for in the assessment or projections but has a bearing on MSY calculations.

Given that the projections are based on close-to-status quo conditions they should be fairly robust and hence provide an adequate basis for management. However, scenarios based on fishing mortality rates that differ substantially from status quo are likely to be much more uncertain because of the effects of different survival rates of males and females and their respective growth schedules.

8) Review, evaluate and report on the status of the SARC and Working Group research recommendations *listed in most recent SARC reviewed assessment and review panel reports and MAFMC SSC reports. Identify new research recommendations.*

The ToR was met.

The working group provided a review of the status of earlier research recommendations and listed new recommendations that have emerged following the most recent assessment. Progress is reported in some areas such as the development of sex specific assessment models. New research recommendations focus on the causes of reduced recent recruitment,

quantifying uncertainty in BRPs and understanding the reasons for slower growth observed in both sexes; clearly issues of importance.

Given that the list of research topics is long and carries a legacy from previous assessments, some of which are less likely to be addressed or are no longer pertinent, there may be some value in re-working the list into a more coherent research plan. This might help in identifying priorities and provide focus for aspiring researchers.

Striped bass

1) Investigate all fisheries independent and dependent data sets*, including life history, indices of abundance, and tagging data. Discuss strengths and weaknesses of the data sources.*

The ToR was fully met.

Available survey data comprise a number of state surveys that typically cover a local area but which taken together cover most of the applicable range. These are listed and described. Some of the abundance indices are aggregate measures while others are age structured or sample only the young of the year (YOY). The only coastwide index is derived from the MRIP survey which has recently been substantially revised. The use of the surveys as indices for specific substocks in producer areas or indices of mixed stocks are described.

Tagging data are described and were used to estimate natural mortality (M). The M values are age specific resulting from a model fit to smooth the estimates. Natural mortality estimates were inflated for the Chesapeake Bay fish during the period when Mycobacteriosis was prevalent. The analysis appears to be the best available at present and is appropriate for use in the current assessment. While there are good grounds to believe this may have an effect, it is hard to discern from the analysis if such an increase is really detectable given uncertainties in the data, such as the tag reporting rate.

The tagging data were also used to derive an index of stock composition assuming that the assessed unit comprises a mixture of a Chesapeake Bay stock and a Hudson/Delaware river stock. This index was intended for use in the two stock SCA model discussed below.

Estimates of female maturity were updated using more recent data.

2) Estimate commercial and recreational landings and discards*. Characterize the uncertainty in the data and spatial distribution of the fisheries. Review new MRIP estimates of catch, effort and the calibration method, if available.*

The ToR was broadly met.

Data were available from the recreational and commercial fisheries that comprise the main components. The commercial landings are a smaller component of the total and are regarded as having minimal error. They are calculated from official landings records at both state and federal level. Recreational catch data are estimated from the MRIP survey and dominate the total catch. The MRIP survey is considered an improvement on the earlier MRFSS survey design. However, the estimates of this component of the catch have been substantially revised to account for sampling bias. The revision has been peer reviewed and is considered an improvement on the earlier values.

Estimates of the recreational fishery discards were made from the MRIP surveys and used an estimate of release mortality to derive dead discards. The release mortality is low but uncertain and small changes in the value used for this mortality can have a large effect on the estimate of dead discards.

In view of the importance of the recreational catch in this fishery, it would have been useful to see recreational landings data presented as a mean and confidence interval based on the sample design to get a minimum estimate of the uncertainty in this component of the data. CVs are provided for the total catch at age data but these appear to be conventional values (e.g. 0.2) or unrealistically low given the uncertainty in the MRIP survey.

3) Use an age-based model to estimate annual fishing mortality, recruitment, total abundance and stock biomass *(total and spawning stock) for the time series and estimate their uncertainty. Provide retrospective analysis of the model results and historical retrospective. Provide estimates of exploitation by stock component and sex, where possible, and for total stock complex.*

The TOR was met but the panel expressed reservations concerning the proposed assessment model.

A new stock assessment model was presented which treats the "stock" as two stocks comprising a Chesapeake Bay (CB) component and a Delaware/Hudson (DH) River component. The CB stock is modelled as fish that move between the Bay and the Ocean, while the DH stock is modelled as being in the Ocean and mixing with migrants from the CB stock. In order to allow for migration both in an out of the Chesapeake Bay, the model is further divided into three time periods. Fish move in and out of the Bay according to externally specified age dependent vectors.

The model is a development of the earlier single stock SCA model used in SARC 57 but is clearly far more complex while offering greater biological realism. Testing had been done to show that the code could recover true values when used on simulated data.

There was considerable discussion of the new model by the panel and whether it formed a robust basis for advice. The panel reached the conclusion that the assessment based on the new model should not be used for advice, but that it showed promise and was likely to provide the assessment approach in the future when further testing and development has been done. Reasons for being cautious about the use of the assessment for advice were as follows:

i. While the model recovered true values from test data, it needs to be more comprehensively tested with simulated data that violate the assumptions in the model as a test of robustness.
ii. In its present form, migration is specified by externally derived movement proportions based on tagging data and maturity. These estimates are very uncertain, yet model results were sensitive to these assumptions.
iii. The fits to some of the data, notably on older fish, were poor, perhaps suggesting that migration had not been adequately captured by the model.
iv. The fit to the stock composition index was poor (i.e., the proportions of CB and DH in the ocean), yet this is the only information to apportion fish between the two stocks at this time.
v. Much of the catch data come from the ocean fishery and contain no information on the relative abundance of the two stocks. The model therefore has very little information to estimate stock specific abundance.
vi. Model convergence was tested by using 100 randomised starting values which showed a failure rate of about 23%. It was also not clear whether the runs that reached the same minimum shared the same parameter estimates.

Notwithstanding these concerns, the model did produce stock trajectories that were consistent with single stock models using essentially the same data. The issue therefore is whether the two stock model provides finer grained information on stock components that is suitable for management advice. This question needs to be further investigated before the model is used for advice.

The working group had done additional assessments using the single stock SCA used at SARC57 and a similar approach using ASAP. These two models produced very similar results. After reviewing the results from these models, the panel proposed that the single stock SCA should be used for advice. Model fit diagnostics and retrospective runs were provided for this model.

4) Use tagging data to estimate mortality and abundance*, and provide suggestions for further development.*

This ToR was fully met. Tagging data analyses are presented that suggest fishing mortality as estimated from these data are similar to the main assessment using the SCA model. However, the analysis suggests that while the overall estimates of Z are fairly robust, the partitioning of Z between F and M is sensitive to the assumption on tag reporting rates.

The use of tagging data provides a very useful additional analysis to support the main assessment and adds reassurance to the results since the data are largely independent of the data used in the SCA model. An obvious further development would be to include the tagging data in the SCA model. If included in the two stock SCA model, the tagging data may help in the estimation of migration rates.

5) Update or redefine biological reference points (BRPs*; point estimates or proxies for BMSY, SSBMSY, FMSY, MSY) for each stock component where possible and for the total stock complex. Make a stock status determination based on BRPs by stock component, where possible, and for the total stock complex.*

The ToR was completed but there are important qualifications to the analysis presented.

Historically, the BRPs for this stock have been based on the 1995 SSB which was regarded as the biomass achieved when the stock had recovered from a period of being overfished. The corresponding fishing mortality reference point is calculated as the F which produces an equilibrium SSB equal to the 1995 SSB. The working group had used the two stock model to redefine BRPs based on the same framework. However, this results in two SSB reference points (one for each stock) and three F reference points—one of DH but two for CB. In the CB case one F value applies to the Bay fishery and the other to the ocean fishery. If accepted, this would imply the CB stock is experiencing over-fishing in the ocean but is fished below the threshold in the Bay. However, the panel regarded this as not biologically meaningful since it is the cumulative F on the stock that should determine status not just one component. This is because there are an infinite number of ways of partitioning F between fleets or areas and a unique solution can only be found by imposing a constraint. In the CB case, for example, although F in the ocean fishery may appear too high, reducing F in the Bay fishery could just as easily result in a cumulative F value that satisfies the BRP. This issue can only be resolved through a consideration of management objectives that go beyond biology alone.

One way of overcoming this indeterminacy is to define the overfishing threshold in terms of the ratio of the equilibrium SSB calculated at status quo F to the SSB in 1995. A ratio of less than 1 would imply the stock is experiencing overfishing.

In view of the panel recommendation to use the single stock assessment model, the two stock reference point issues should not arise. Application of the BRP framework to the single stock SCA model is appropriate at present and suggests the stock is both overfished and experiencing overfishing.

6) Provide annual projections *of catch and biomass under alternative harvest scenarios. Projections should estimate and report annual probabilities of exceeding threshold BRPs for F and probabilities of falling below threshold BRPs for biomass.*

This ToR was completed and catch projections supplied based on the new 2-stock model and stock specific BRPs. However, following the discussion of the BRPs and the choice of assessment model, the projections need to be re-run based on the preferred single stock model. During the meeting, results for the single stock projections were presented by the working group.

7) Review and evaluate the status of the Technical Committee research *recommendations listed in the most recent SARC report. Identify new research recommendations. Recommend timing and frequency of future assessment updates and benchmark assessments.*

The ToR was met. The working group has usefully classified research recommendations into three categories of priority. The recommendations are in themselves quite reasonable and likely to improve assessments in the future if successfully carried out. However, there appears to be no mechanism to develop a more strategic approach to pursuing research recommendations that takes into account the available resources and the wider priorities of managers. Some thought should be given to drawing on the research recommendations across the various stocks and developing a research plan that clearly identifies topics of highest priority.

As discussed in the assessment model section, the new two stock model appears very promising and should be pursued. At present, this model needs more thorough testing on a range of simulated data. In addition, a comparison should be made of the performance of the two stock model and the single stock model when applied to simulated data comprising two stocks.

Conclusions and Recommendations

For both summer flounder and striped bass, sufficient data are available to conduct a full age structured stock assessment. The data include landings and discards and fishery independent survey indices. The data were handled appropriately and the assessment models appear to be robust to a range of sensitivity tests and diagnostics. In the case of striped bass, the single stock SCA model should be used until the two stock assessment model can be shown to be robust. The assessments provide an adequate basis for management advice.

The choice of separate landings and discard fleet components in the summer flounder assessment is not realistic since the estimates of fleet selectivity have little meaning. It would be preferable to model fleet selectivity (the capture process) and discarding (post capture retention) as separate processes. I recommend that future assessments model true fleets (commercial, recreational, etc.) and that discards are modelled using a retention ogive acting after fleet selectivity. This is a more conventional way of modelling fleets and leads to more meaningful values of selectivity.

Sexually dimorphic growth is a feature of summer flounder. There are implications for the assessment in relation to estimated mortality rates and estimation of MSY reference points. Exploratory modelling of two sex assessments is dependent on data to split the sexes which appears limited. Further development of these models should only continue if there is a realistic prospect of deriving split sex age compositions for the catch.

The new two stock model for striped bass appears very promising and should be pursued. At present this model needs more thorough testing on a range of simulated data. In addition, a

comparison should be made of the performance of the two stock model and the single stock model on simulated data comprising two stocks.

Some of the reviewers' comments made for the same stocks at the SARC 57 review were not addressed by the assessment teams. This in part seems to be due to the absence of a formal mechanism to consider these comments. I would recommend that assessment teams are asked respond to the points raised by past reviewers to ensure they are properly considered and action taken where this is merited.

Appendix 1: Bibliography of materials provided for review

A – Summer flounder

Deen S, Jauss V, Sullivan PJ. 2018 MS. The effect of ocean environmental conditions on the relative abundance of summer flounder (*Paralichthys dentatus*): spatio-temporal analysis and model comparison using R-INLA. Cornell University, Ithaca NY. SAW/SARC 66 Summer Flounder Working Group Working Paper. 46 p.

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Additional Documents

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"Public testimony for the summer flounder independent expert review". From: Save the Summer Flounder Fishery Fund. Nov. 2018.

Appendix 2: Performance Work Statement (PWS)

National Oceanic and Atmospheric Administration (NOAA)
National Marine Fisheries Service (NMFS)
Center for Independent Experts (CIE) Program
External Independent Peer Review

66th Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC)
Benchmark stock assessment for Summer flounder and Striped bass

Background

The National Marine Fisheries Service (NMFS) is mandated by the Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act, and Marine Mammal Protection Act to conserve, protect, and manage our nation's marine living resources based upon the best scientific information available (BSIA). NMFS science products, including scientific advice, are often controversial and may require timely scientific peer reviews that are strictly independent of all outside influences. A formal external process for independent expert reviews of the agency's scientific products and programs ensures their credibility. Therefore, external scientific peer reviews have been and continue to be essential to strengthening scientific quality assurance for fishery conservation and management actions.

Scientific peer review is defined as the organized review process where one or more qualified experts review scientific information to ensure quality and credibility. These expert(s) must conduct their peer review impartially, objectively, and without conflicts of interest. Each reviewer must also be independent from the development of the science, without influence from any position that the agency or constituent groups may have. Furthermore, the Office of Management and Budget (OMB), authorized by the Information Quality Act, requires all federal agencies to conduct peer reviews of highly influential and controversial science before dissemination, and that peer reviewers must be deemed qualified based on the OMB Peer Review Bulletin standards[1]. Further information on the Center for Independent Experts (CIE) program may be obtained from www.ciereviews.org.

Scope

The Northeast Regional Stock Assessment Review Committee (SARC) meeting is a formal, multiple-day meeting of stock assessment experts who serve as a panel to peer-review tabled stock assessments and models. The SARC peer review is the cornerstone of the Northeast Stock Assessment Workshop (SAW) process, which includes assessment development, and report preparation (which is done by SAW Working Groups or Atlantic States Marine Fisheries Commission (ASMFC) technical committees), assessment peer review (by the SARC), public presentations, and document publication. This review determines whether or not the scientific assessments are adequate to serve as a basis for developing fishery management advice. Results provide the scientific basis for fisheries within the jurisdiction of NOAA's Greater Atlantic Regional Fisheries Office (GARFO).

[1] http://www.cio.noaa.gov/services_programs/pdfs/OMB_Peer_Review_Bulletin_m05-03.pdf

The purpose of this meeting will be to provide an external peer review of a benchmark stock assessment **Summer flounder and Striped bass**. The requirements for the peer review follow. This Statement of Work (PWS) also includes: **Appendix 1**: TORs for the stock assessment, which are the responsibility of the analysts; **Appendix 2:** a draft meeting agenda; **Appendix 3:** Individual Independent Review Report Requirements; and **Appendix 4:** SARC Summary Report Requirements.

Requirements

NMFS requires three reviewers under this contract (i.e. subject to CIE standards for reviewers) to participate in the panel review. The SARC chair, who is in addition to the three reviewers, will be provided by either the New England or Mid-Atlantic Fishery Management Council's Science and Statistical Committee; although the SARC chair will be participating in this review, the chair's participation (i.e. labor and travel) is not covered by this contract.

Each reviewer will write an individual review report in accordance with the PWS, OMB Guidelines, and the TORs below. All TORs must be addressed in each reviewer's report. No more than one of the reviewers selected for this review is permitted to have served on a SARC panel that reviewed this same species in the past. The reviewers shall have working knowledge and recent experience in the application of modern fishery stock assessment models. Expertise should include forward projecting statistical catch-at-age (SCAA) models. Reviewers should also have experience in evaluating measures of model fit, identification, uncertainty, and forecasting. Reviewers should have experience in development of Biological Reference Points (BRPs) that includes an appreciation for the varying quality and quantity of data available to support estimation of BRPs. For summer flounder, knowledge of flatfish biology and population dynamics would be useful. For striped bass, knowledge of anadromous species and SCAA models with spatial considerations would be useful.

Tasks for Reviewers

- Review the background materials and reports prior to the review meeting
- Attend and participate in the panel review meeting
    - The meeting will consist of presentations by NOAA and other scientists, stock assessment authors and others to facilitate the review, to provide any additional information required by the reviewers, and to answer any questions from reviewers
- Reviewers shall conduct an independent peer review in accordance with the requirements specified in this PWS and TORs, in adherence with the required formatting and content guidelines; reviewers are not required to reach a consensus.
- Each reviewer shall assist the SARC Chair with contributions to the SARC Summary Report
- Deliver individual Independent Review Reports to the Government according to the specified milestone dates

- This report should explain whether each stock assessment Term of Reference of the SAW was or was not completed successfully during the SARC meeting, using the criteria specified below in the "Tasks for SARC panel."
- If any existing Biological Reference Points (BRP) or their proxies are considered inappropriate, the Independent Report should include recommendations and justification for suitable alternatives. If such alternatives cannot be identified, then the report should indicate that the existing BRPs are the best available at this time.
- During the meeting, additional questions that were not in the Terms of Reference but that are directly related to the assessments may be raised. Comments on these questions should be included in a separate section at the end of the Independent Report produced by each reviewer.
- The Independent Report can also be used to provide greater detail than the SARC Summary Report on specific stock assessment Terms of Reference or on additional questions raised during the meeting.

Tasks for SARC panel

- During the SARC meeting, the panel is to determine whether each stock assessment Term of Reference (TOR) of the SAW was or was not completed successfully. To make this determination, panelists should consider whether the work provides a scientifically credible basis for developing fishery management advice. Criteria to consider include: whether the data were adequate and used properly, the analyses and models were carried out correctly, and the conclusions are correct/reasonable. If alternative assessment models and model assumptions are presented, evaluate their strengths and weaknesses and then recommend which, if any, scientific approach should be adopted. Where possible, the SARC chair shall identify or facilitate agreement among the reviewers for each stock assessment TOR of the SAW.
- If the panel rejects any of the current BRP or BRP proxies (for B_{MSY} and F_{MSY} and MSY), the panel should explain why those particular BRPs or proxies are not suitable, and the panel should recommend suitable alternatives. If such alternatives cannot be identified, then the panel should indicate that the existing BRPs or BRP proxies are the best available at this time.
- Each reviewer shall complete the tasks in accordance with the PWS and Schedule of Milestones and Deliverables below.

Tasks for SARC chair and reviewers combined:

Review both the Assessment Report and the draft Assessment Summary Report. The draft Assessment Summary Report is reviewed and edited to assure that it is consistent with the outcome of the peer review, particularly statements about stock status recommendations and descriptions of assessment uncertainty.

The SARC Chair, with the assistance from the reviewers, will write the SARC Summary Report. Each reviewer and the chair will discuss whether they hold similar views on each stock assessment Term of Reference and whether their opinions can be summarized into a single conclusion for all or only for some of the Terms of Reference of the SAW. For terms where a similar view can be reached, the SARC Summary Report will contain a summary of such opinions. In cases where multiple and/or differing views exist on a given Term of Reference,

the SARC Summary Report will note that there is no agreement and will specify - in a summary manner – what the different opinions are and the reason(s) for the difference in opinions.

The chair's objective during this SARC Summary Report development process will be to identify or facilitate the finding of an agreement rather than forcing the panel to reach an agreement. The chair will take the lead in editing and completing this report. The chair may express the chair's opinion on each Term of Reference of the SAW, either as part of the group opinion, or as a separate minority opinion. The SARC Summary Report will not be submitted, reviewed, or approved by the Contractor.

If any existing Biological Reference Points (BRP) or BRP proxies are considered inappropriate, the SARC Summary Report should include recommendations and justification for suitable alternatives. If such alternatives cannot be identified, then the report should indicate that the existing BRP proxies are the best available at this time.

Foreign National Security Clearance
When 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 reviewers who are non-US citizens. For this reason, the reviewers shall provide requested information (e.g., first and last name, contact information, gender, birth date, country of birth, country of citizenship, country of permanent residence, country of current residence, dual citizenship (yes, no), passport number, country of passport, travel dates.) to the NEFSC SAW Chair 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/ and http://deemedexports.noaa.gov/compliance_access_control_procedures/noaa-foreign-national-registration-system.html. The contractor is required to use all appropriate methods to safeguard Personally Identifiable Information (PII).

Place of Performance
The place of performance shall be at the contractor's facilities, and at the Northeast Fisheries Science Center in Woods Hole, Massachusetts.

Period of Performance
The period of performance shall be from the time of award through January 31, 2019. Each reviewer's duties shall not exceed **16** days to complete all required tasks.

Schedule of Milestones and Deliverables: The contractor shall complete the tasks and deliverables in accordance with the following schedule.

No later than Oct. 26, 2018	Contractor selects and confirms reviewers
No later than Nov. 13, 2018	NMFS Project Contact will provide reviewers the pre-review documents
Nov. 27-30, 2018	Each reviewer participates and conducts an independent peer review during the panel review meeting in Woods Hole, MA
Nov. 30, 2018	SARC Chair and reviewers work at drafting reports during meeting at Woods Hole, MA, USA
Dec. 14, 2018	Reviewers submit draft independent peer review reports to the contractor's technical team for review
Dec. 14, 2018	Draft of SARC Summary Report, reviewed by all reviewers, due to the SARC Chair *
Dec. 21, 2018	SARC Chair sends Final SARC Summary Report, approved by reviewers, to NMFS Project contact (i.e., SAW Chairman)
Jan. 2, 2019	Contractor submits independent peer review reports to Government
Jan. 9, 2019	The COR and/or technical POC distributes the final reports to the NMFS Project Contact

* The SARC Summary Report will not be submitted to, reviewed, or approved by the Contractor.

Applicable Performance Standards

The acceptance of the contract deliverables shall be based on three performance standards: (1) The reports shall be completed in accordance with the required formatting and content (2) The reports shall address each TOR as specified (3) The reports shall be delivered as specified in the schedule of milestones and deliverables.

Travel

All travel expenses shall be reimbursable in accordance with Federal Travel Regulations (http://www.gsa.gov/portal/content/104790). International travel is authorized for this contract. Travel is not to exceed $12,000.

Restricted or Limited Use of Data

The contractors may be required to sign and adhere to a non-disclosure agreement.

NMFS Project Contact

Dr. James Weinberg, NEFSC SAW Chair
Northeast Fisheries Science Center
166 Water Street, Woods Hole, MA 02543

James.Weinberg@noaa.gov Phone: 508-495-2352

Appendix 1. Stock Assessment Terms of Reference for SAW/SARC-66

The SARC Review Panel shall assess whether or not the SAW Working Group has reasonably and satisfactorily completed the following actions.

The stock assessments for SAW/SARC66 require new calibrated catch and effort data from the Marine Recreational Information Program (MRIP). For these assessments to happen, the assessment scientists need the new MRIP data in a form ready for analysis by July 1, 2018.

A. Summer flounder

1. Estimate catch from all sources, including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data. Compare previous recreational data to re-estimated Marine Recreational Information Program (MRIP) data (if available).

2. Present the survey data available, and describe the basis for inclusion or exclusion of those data in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, etc.). Investigate the utility of commercial or recreational LPUE as a measure of relative abundance. Characterize the uncertainty and any bias in these sources of data.

3. Describe life history characteristics and the stock's spatial distribution (for both juveniles and adults), including any changes over time. Describe factors related to productivity of the stock and any ecosystem factors influencing recruitment. If possible, integrate the results into the stock assessment.

4. Estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and estimate their uncertainty. Include retrospective analyses (both historical and within-model) to allow a comparison with previous assessment results and projections, and to examine model fit. Examine sensitivity of model results to changes in re-estimated recreational data.

5. State the existing stock status definitions for "overfished" and "overfishing". Then update or redefine biological reference points (BRPs; point estimates or proxies for B_{MSY}, $B_{THRESHOLD}$, F_{MSY} and MSY) and provide estimates of their uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for BRPs. Comment on the scientific adequacy of existing BRPs and the "new" (i.e., updated, redefined, or alternative) BRPs.

6. Make a recommendation[a] about what stock status appears to be, based on the existing model (i.e., model from previous peer reviewed accepted assessment) and with respect to a new modeling approach(-es) developed for this peer review.

a. Update the existing model with new data and make a stock status recommendation (about overfished and overfishing) with respect to the existing BRP estimates.
b. Then use the newly proposed modeling approach(-es) and make a stock status recommendation with respect to "new" BRPs and their estimates (from TOR-5).
c. Include descriptions of stock status based on simple indicators/metrics (e.g., age- and size-structure, temporal trends in population size or recruitment indices, etc).

7. Develop approaches and apply them to conduct stock projections.

d. Provide numerical annual projections (5 years) and the statistical distribution (i.e., probability density function) of the catch at F_{MSY} or an F_{MSY} proxy (i.e. the overfishing level, OFL) (see Appendix to the SAW TORs). Each projection should estimate and report annual probabilities of exceeding threshold BRPs for F, and probabilities of falling below threshold BRPs for biomass. Use a sensitivity analysis approach in which a range of assumptions about the most important uncertainties in the assessment are considered (e.g., terminal year abundance, variability in recruitment).
e. Comment on which projections seem most realistic. Consider the major uncertainties in the assessment as well as sensitivity of the projections to various assumptions. Identify reasonable projection parameters (recruitment, weight-at-age, retrospective adjustments, etc.) to use when setting specifications.
f. Describe this stock's vulnerability (see "Appendix to the SAW TORs") to becoming overfished, and how this could affect the choice of ABC.

8. Review, evaluate and report on the status of the SARC and Working Group research recommendations listed in most recent SARC reviewed assessment and review panel reports and MAFMC SSC reports. Identify new research recommendations.

[a]NOAA Fisheries has final responsibility for making the stock status determination for this stock based on best available scientific information.

B. Striped bass

1. Investigate all fisheries independent and dependent data sets, including life history, indices of abundance, and tagging data. Discuss strengths and weaknesses of the data sources.

2. Estimate commercial and recreational landings and discards. Characterize the uncertainty in the data and spatial distribution of the fisheries. Review new MRIP estimates of catch, effort and the calibration method, if available.

3. Use an age-based model to estimate annual fishing mortality, recruitment, total abundance and stock biomass (total and spawning stock) for the time series and estimate their uncertainty.

Provide retrospective analysis of the model results and historical retrospective. Provide estimates of exploitation by stock component and sex, where possible, and for total stock complex.

4. Use tagging data to estimate mortality and abundance, and provide suggestions for further development.

5. Update or redefine biological reference points (BRPs; point estimates or proxies for BMSY, SSBMSY, FMSY, MSY) for each stock component where possible and for the total stock complex. Make a stock status determination based on BRPs by stock component, where possible, and for the total stock complex.

6. Provide annual projections of catch and biomass under alternative harvest scenarios. Projections should estimate and report annual probabilities of exceeding threshold BRPs for F and probabilities of falling below threshold BRPs for biomass.

7. Review and evaluate the status of the Technical Committee research recommendations listed in the most recent SARC report. Identify new research recommendations. Recommend timing and frequency of future assessment updates and benchmark assessments.

SAW Assessment TORs:

Clarification of Terms
used in the Stock Assessment Terms of Reference

Guidance to SAW Working Group about "Number of Models to include in the Assessment Report":

In general, for any TOR in which one or more models are explored by the Working Group, give a detailed presentation of the "best" model, including inputs, outputs, diagnostics of model adequacy, and sensitivity analyses that evaluate robustness of model results to the assumptions. In less detail, describe other models that were evaluated by the Working Group and explain their strengths, weaknesses and results in relation to the "best" model. If selection of a "best" model is not possible, present alternative models in detail, and summarize the relative utility each model, including a comparison of results. It should be highlighted whether any models represent a minority opinion.

On "Acceptable Biological Catch" (DOC Nat. Stand. Guidelines. Fed. Reg., v. 74, no. 11, 1-16-2009):

Acceptable biological catch (ABC) is a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of Overfishing Limit (OFL) and any other scientific uncertainty…" *(p. 3208) [In other words, OFL ≥ ABC.]*

ABC for overfished stocks. For overfished stocks and stock complexes, a rebuilding ABC must be set to reflect the annual catch that is consistent with the schedule of fishing mortality rates in the rebuilding plan. *(p. 3209)*

NMFS expects that in most cases ABC will be reduced from OFL to reduce the probability that overfishing might occur in a year. (p. 3180)

ABC refers to a level of ''catch'' that is ''acceptable'' given the ''biological'' characteristics of the stock or stock complex. As such, Optimal Yield (OY) does not equate with ABC. The specification of OY is required to consider a variety of factors, including social and economic factors, and the protection of marine ecosystems, which are not part of the ABC concept. (p. 3189)

On "Vulnerability" (DOC Natl. Stand. Guidelines. Fed. Reg., v. 74, no. 11, 1-16-2009):

"Vulnerability. A stock's vulnerability is a combination of its productivity, which depends upon its life history characteristics, and its susceptibility to the fishery. Productivity refers to the capacity of the stock to produce Maximum Sustainable Yield (MSY) and to recover if the population is depleted, and susceptibility is the potential for the stock to be impacted

by the fishery, which includes direct captures, as well as indirect impacts to the fishery (e.g., loss of habitat quality)." (p. 3205)

Participation among members of a Stock Assessment Working Group:

Anyone participating in SAW meetings that will be running or presenting results from an assessment model is expected to supply the source code, a compiled executable, an input file with the proposed configuration, and a detailed model description in advance of the model meeting. Source code for NOAA Toolbox programs is available on request. These measures allow transparency and a fair evaluation of differences that emerge between models.

Appendix 2. Draft Review Meeting Agenda

{Final Meeting agenda to be provided at time of award}

65th Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC)
Benchmark stock assessment for A. Summer flounder and B. Striped bass

November 27-30, 2018

Stephen H. Clark Conference Room – Northeast Fisheries Science Center
Woods Hole, Massachusetts

DRAFT AGENDA* (version: June 14, 2018)

TOPIC	PRESENTER(S)	SARC LEADER	RAPPORTEUR

Tuesday, Nov. 27

10 – 10:45 AM
Welcome/Description of Review Process **James Weinberg**, SAW Chair
Introductions/Agenda **TBD,** SARC Chair
Conduct of Meeting

10:45 – 12:45 PM Assessment Presentation (A. Summer flounder)
Mark Terceiro **TBD**

12:45 – 1:45 PM Lunch

1:45 – 3:45 PM Assesssment Presentation (A. Summer flounder)
Mark Terceiro **TBD**

3:45 – 4 PM Break

4 – 5:45 PM SARC Discussion w/ Presenters (A. Summer flounder)
TBD, SARC Chair **TBD**

5:45 – 6 PM Public Comments

TOPIC	PRESENTER(S)	SARC LEADER	RAPPORTEUR

Wednesday, Nov. 28

8:30 – 10:30 AM	Assessment Presentation (B. Striped bass)		
	Katie Drew		**TBD**
10:30 – 10:45 AM	Break		
10:45 – 12:30 PM	Assessment Presentation (B. Striped bass)		
	Katie Drew		**TBD**
12:30 – 1:30 PM	Lunch		
1:30 – 3:30 PM	SARC Discussion w/presenters (B. Striped bass)		
	TBD, SARC Chair		**TBD**
3:30 – 3:45 PM	Public Comments		
3:45 -4 PM	Break		
4 – 6 PM	Revisit with Presenters (A. Summer flounder)		
	TBD, SARC Chair		**TBD**
7 PM	**(**Social Gathering**)**		

TOPIC	PRESENTER(S)	SARC LEADER	RAPPORTEUR

Thursday, Nov. 29

8:30 – 10:30 Revisit with Presenters (B. Striped bass)
TBD, SARC Chair **TBD**

10:30 – 10:45 Break

10:45 – 12:15 Review/Edit Assessment Summary Report (A. Summer flounder)
TBD, SARC Chair **TBD**

12:15 – 1:15 PM Lunch

1:15 – 2:45 PM (cont.) Edit Assessment Summary Report (A. Summer flounder)
TBD, SARC Chair **TBD**

2:45 – 3 PM Break

3 – 6 PM Review/edit Assessment Summary Report (B. Striped bass)
TBD, SARC Chair **TBD**

Friday, Nov. 30

9:00 AM – 5:00 PM SARC Report writing

*All times are approximate, and may be changed at the discretion of the SARC chair. The meeting is open to the public; however, during the Report Writing sessions we ask that the public refrain from engaging in discussion with the SARC.

Appendix 3. Individual Independent Peer Review Report Requirements

1. The independent peer review report shall be prefaced with an Executive Summary providing a concise summary of whether they accept or reject the work that they reviewed, with an explanation of their decision (strengths, weaknesses of the analyses, etc.).

2. The report must contain a background section, description of the individual reviewers' roles 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. The independent report shall be an independent peer review, and shall not simply repeat the contents of the SARC Summary Report.

   a. Reviewers should describe in their own words the review activities completed during the panel review meeting, including a concise summary of whether they accept or reject the work that they reviewed, and explain their decisions (strengths, weaknesses of the analyses, etc.), conclusions, and recommendations.

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

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

   d. The report may include recommendations on how to improve future assessments.

3. The report shall include the following appendices:

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

Appendix 4. SARC Summary Report Requirements

1. The main body of the report shall consist of an introduction prepared by the SARC chair that will include the background and a review of activities and comments on the appropriateness of the process in reaching the goals of the SARC. Following the introduction, for each assessment reviewed, the report should address whether or not each Term of Reference of the SAW Working Group was completed successfully. For each Term of Reference, the SARC Summary Report should state why that Term of Reference was or was not completed successfully.

   To make this determination, the SARC chair and reviewers should consider whether or not the work provides a scientifically credible basis for developing fishery management advice. If the reviewers and SARC chair do not reach an agreement on a Term of Reference, the report should explain why. It is permissible to express majority as well as minority opinions.

   The report may include recommendations on how to improve future assessments.

2. If any existing Biological Reference Points (BRPs) or BRP proxies are considered inappropriate, include recommendations and justification for alternatives. If such alternatives cannot be identified, then indicate that the existing BRPs or BRP proxies are the best available at this time.

3. The report shall also include the bibliography of all materials provided during the SAW, and relevant papers cited in the SARC Summary Report, along with a copy of the CIE Statement of Work.

   The report shall also include as a separate appendix the assessment Terms of Reference used for the SAW, including any changes to the Terms of Reference or specific topics/issues directly related to the assessments and requiring Panel advice.

Appendix 3: Panel membership

NAME	Role	AFFILIATION
Robert Latour	Panel chair	Viginia Institute of Marine Science
Yan Jiao	CIE reviewer	Virginia Tech University
Robin Cook	CIE reviewer	University of Strathclyde, Glasgow, UK
John Casey	CIE reviewer	Independent Consultant
Russell Brown		NEFSC
Jim Weinberg	SAW chair	NEFSC
Mark Terceiro	Presenter	NEFSC
Katie Drew	Presenter	ASMFC
Gary Nelson	Presenter	MA DMF
Michael Celestino	WG chair/presenter	NJ DFW
Kirby Rootes-Murdy	Council rep	ASMFC
Max Appelman	Council rep	ASMFC
Patrick Sullivan		Cornell University
Jason Boucher		DE Fish and Wildlife
Patrick Paquette		MA Striped Bass Association
Tiffany Cunningham		MADMF
Jessica Coakley	WG chair	MAFMC
Kiley Dancy		MAFMC
Alicia Miller		NEFSC
Anne Richards		NEFSC
Brian Linton		NEFSC
Charles Adams		NEFSC
Charles Perretti		NEFSC
Chris Legault		NEFSC
Dvora Hart		NEFSC
Gary Shepherd		NEFSC
Greg Ardini		NEFSC
Michele Traver		NEFSC
Katherine Sosebee		NEFSC
Paul Nitschke		NEFSC
Toni Chute		NEFSC
Tony Wood		NEFSC
Jeff Brust		NJ DFW
Nicole Lengyel		RI DMF
Rick Bellavance		RIPCBA
Steve Cadrin		SMAST
Evans Kwasi Arizi		URI
Miriam Ameworwor		URI/UCC
Najih Lazar		URI-GSO