UM Independent System for Peer Reviews

Consultant Report on:

39th Stock Assessment Review Committee for Black Seabass, Scallop, and Bluefish Assessments

7-10 June 2004, Woods Hole, MA

Paul A. Medley
Sunny View
Jack Hole
Alne, YO61 1RT
UK
paul.medley@virgin.net

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Executive Summary

The black seabass assessment based on tagging work met the terms of reference. The tagging should continue even if only infrequently.

The scallop assessment provides good estimates of biomass based on dredge surveys. Fishing mortality is less well estimated as it is affected by statistical error, unreported catch and uncertain discard mortality.

The bluefish assessment had significant problems with survey and CPUE indices, recreational catch estimates and a poor model fit, making results uncertain. The abundance and catches need to be re-examined before an adequate assessment can be made.

All assessments need to develop new population model based methods. The tagging work will probably not be sustainable. Scallop and bluefish were unable to present population models which could explain observed data at the time of the review.

Research is required to combine and standardise survey indices to allow all survey data to be used in each assessment.

The recreational catch and effort needs to be standardised and recreational catch uncertainty needs to be accounted for in assessments.

It should be ensured that reference points and current variable estimates are compatible and can be automatically updated in assessments if necessary.

Various other more detailed issues and recommendations are raised in this report.

Background

This report reviews three stock assessments presented at the 39th Northeast Regional Stock Assessment Workshop. Stock assessment reports were provided to the Stock Assessment Review Committee prior to the meeting. The assessments for the three stocks, black seabass, scallop and bluefish, were reviewed by panel members who were all selected as outside independent experts. The review was limited to the presentations and reports of the assessments which had been completed. No additional work was requested by the stock assessment scientists during the meeting. The panel was not required to give management advice, only comment on the assessment work. This was a different approach compared to previous workshops.

Review Activities

The stock assessment workshop was held at Northeast Fisheries Science Center in Woods Hole, Massachusetts, from 7-10 June 2004. The stock assessment documents were received prior to the meeting. For each stock, a presentation was given and discussions took place (see Appendix 3). This allowed the panel to ask questions and obtain clarification, but no new analyses could be requested. Presentations were given by representatives of the working groups and authors of the stock assessment reports. This report is based upon a review of the documents received and discussions at the meeting (see Appendix 5).

Common Issues

Findings

All assessments depend on the abundance survey indices, so analyses of these surveys will benefit many assessments. The surveys were included or excluded on an individual basis as though they were indices of the whole stock. Treating the State trawl surveys in this way is inappropriate. If surveys cover separate areas, it is likely that they will be additive. However, there may be area overlap, and differences in seasonal timing, gear and methodology will make it necessary to standardise and combine survey indices using a generalized linear modelling approach.

There is a danger in these assessments that reference points and indicators will not be compatible as they are not necessarily allowed to be updated at the same time. A reference point from a previous assessment using different models or parameters may not be compatible if models or parameters have changed. For example, a change in growth parameters will change estimates both of current F and F_{MSY}.

To minimise assessment rejections, it would be useful to draw up a list of standard diagnostics which should anticipate commonly requested additional work. The change in the SARC review system does not allow for additional work to be requested from assessment scientists during the meeting. Reasonable requests could in most cases be predicted.

Where there are difficulties which cannot be resolved through improvements in assessment analysis, Monte Carlo simulation modelling can be used to test how important the issue is. For example, autocorrelations often occur in index residuals and indicate the population model does not explain the process behaviour of the abundance indices fully. Such process error can be reintroduced into Monte Carlo simulations, such as bootstraps, to see how much uncertainty they cause. Strictly speaking, Monte Carlo simulations should also be used to test whether bootstrapping provides good estimates of estimation errors (Manly 1997). However, because of the considerable additional work involved, some judgement is necessary in identifying key issues to test using this technique.

Risks and uncertainty are not well communicated to management. Uncertainty in the assessments was assessed through reporting probability, standard errors and so on. However, these statistics may not help in deciding upon the state of the stock and exploitation rate relative to the reference points, which is required. Decision analysis using decision tables, for example, would help address this issue, as long as the decision to be made is clear. Whereas scientific assessments provide probabilities of outcomes for such assessments, the costs and benefits from such outcomes are usually not available. Nevertheless, some attempt is necessary as assessments which do not give some indication of uncertainty can be misleading.

It needs to be made clear how accurate the recreational catch estimates are. Recreational catch and effort data, used in the finfish assessments is based on trip interviews and a telephone frame survey. The CPUE is raised according to the estimate of frame survey total effort to obtain the total catch. These catches are estimates and should be treated as such in assessments rather than direct observations.

Recommendations

New ways need to be developed to combine the various state and coast-wide abundance surveys into consistent indices of abundance usable in assessments. As a result it should be possible to use more indices in assessments and make better use of the available information.

Automatic updating of reference points should form part of every assessment where the fitted model defines the reference.

A checklist of standardised diagnostics output should be developed for assessment scientists and working groups to make reviews easier. The checklist would cover much of the output already presented in assessment documents, such as residual and observed-expected plots. Other diagnostics, even if not included in the assessment documents, could be prepared for reviews. I would suggest the following are included where appropriate:

- Observed and expected plots of survey, CPUE and size/age compositions.
- Re-run maximum likelihood fits from random parameter start positions to ensure the final parameter fit is not a local maximum.
- Test more and less parsimonious versions of the model, providing test statistics for the exclusion/inclusion of parameters.
- Retrospective analyses to test the predictive capability of the model.
- Parameter estimate standard errors and correlation matrix (or a cut down version if large number of parameters).
- Autocorrelations and cross-correlations of residuals for time series models give indications of model problems and possible improvements.

Assumptions and errors should be tested through simulations where possible. Information should be presented testing the sensitivity of the results to important assumptions and errors in the assessment. This allows the reviewers to focus discussion on the important issues.

Some sort of simple method needs to be developed to allow managers to assimilate risks and uncertainty in the assessments, such as decision tables. Decision tables require a definition of the decision which will be made and some indication of the costs resulting from the interaction between the management decision and the state of nature. As a result, scientists cannot develop these tools alone, but will require management to help specify what is required.

Recreational catches are estimated with sampling error, and this error should be included in assessment models.

Black Seabass

Findings

The assessment meets all terms of reference except the evaluation of biological reference points (Appendix 2). Estimation of biological reference points was not appropriate without a population model incorporating growth and mortality.

Any education and awareness project to improve the return rate from the recreational fishermen would be a valuable exercise. The tagging assessment seems to be robust and appears to be a good way to assess stocks which predominantly serve recreational fisheries. Extension of tagging to estimate other parameters, such as tag shedding rate and migration was proposed. However, the reporting rate of the fishermen appears to be the biggest concern for sensitivity of the tag based estimates. The current estimates assume all $100 reward tags are returned. Developing ways to decrease this sensitivity at least with respect to recreational tag returns would seem to be good investment. By improving the general rate of return, sensitivity will decrease as the proportion returned approaches 1.0 even if it is not known exactly.

Tagging is relatively expensive and is unlikely to form the basis of the assessments in the longer term. Tagging experiments could still be repeated even if less frequently and used to test assessment assumptions as well as estimate many population parameters independently.

Age based assessments would appear to be the best option for developing a population model. The tagging experiments estimate many of the parameters used in these assessments, allowing a smooth transition.

There are a number of concerns with moving to a population model. Catches and discards are not known precisely, and there were questions whether the survey indices were proportional to stock size. Whereas catch uncertainty can be dealt with in the assessment, unreported catches, such as discards, can introduce significant bias. Based on the information presented it was not possible to assess how influential these errors and assumptions might be.

Conclusions and Recommendations

A standard assessment based on a population model should be developed for this stock. A catch-at-age model would seem most appropriate. Ageing of the collected hard-parts of fish should be carried out as soon as possible to allow transition from the tagging-based assessment.

Tagging return rates could probably be improved by education and awareness. Recreational fishermen who do not return tags, regardless of the reward, cannot understand how and why this experiment is being carried out. It may also be useful to involve fishermen in tagging fish. This may be justified less on the value of their tagging data than the education and awareness this encourages in recreational fishermen in providing scientific information and reporting tag captures.

Tagging experiments should continue infrequently, if possible, once the current program is complete.

Scallop

Findings

Estimates were provided of stock size and fishing mortality for the Mid-Atlantic Bight and Georges Bank separately, although combined values are used for management purposes. Biomass estimates from the dredge survey appear well-founded and reasonably accurate. The fishing mortality estimates are probably not reliable. The stock status relative to the reference points for 2003 was correspondingly good for biomass, but poor for fishing mortality. The Gulf of Maine stock was not updated due to too little information on this area.

There was not enough new information to justify a change in the reference points. No short term projections were conducted.

The assessment of the state of the stock had not changed since the previous review, so previous comments made in SARC 32 still apply. It was disappointing that greater progress had not been made towards using a population model to assess the state of the stock.

Considerable work has gone into verifying and improving the dredge survey used to estimate biomass. The biomass survey therefore appears to be reliable and there was greater confidence in the dredge surveys than at SARC 32.

The assessment was still required to assess Georges Bank and mid-Atlantic populations as a single stock. Since the fishing mortality and biomass is clearly different in these two areas, this does not make much sense. There is a strong argument, with closed areas proving effective in increasing biomass, not only to move to separate assessments for these two areas, but also to consider more specific area management and assessment.

Neither of the methods for estimating fishing mortality include the observation errors in the model, making interpretation difficult. The catch-biomass method is affected by discard mortality estimates and unreported catch. The survey based estimator assumes exact correspondence between size and age, which results in negative F’s in some years as recruits spill over into the larger size group. No attempt has been made to correct these problems. Reliance on the method combining these two indices again takes no proper account of statistical errors. Despite these problems, the two indices have similar trends in F, giving the general result more credibility. However, it should be noted that the indices are not entirely independent as they are based on the same survey data.

Size compositions of landings are uncertain, making it difficult to set up a size-based population model. Furthermore, the closed and rotating areas will affect size compositions landed and change the effective overall selectivity.

The assessment should get credit for estimating natural mortality. While the method of using clapper ratios has problems it still provides an independent estimate.

It will be necessary to address recruitment from Canada. Depending upon how Canada conducts its stock assessment, it may be possible to use SSB or recruitment indices from the nearby Canadian Georges Bank.

It would have been very useful to put the corresponding estimates of current F into the YPR sensitivity analysis table with the length based per-recruit model results. This would identify the sensitivity of the whole assessment, rather than just the reference points, to the parameters tested.

Comments on the CASA Model

The Catch At Size Analysis (CASA) modelling approach looks promising. The method applies a catch-at-length model with a transition matrix modelling the growth. The model is equivalent to catch-at-age, so all standard diagnostics and estimation procedures can be applied. Many of these diagnostics were produced in Appendix 4 of the scallop assessment document, which made the model easier to review. For a catch-at-age modelling approach, the model is relatively parsimonious.

The transition matrix allows estimation of growth conditional upon current size rather than age. Age is still implicitly recorded, so any claim for robustness by avoiding ages directly is false. However, in this case the transition matrix should work well as it is much easier to identify growth increments than estimate absolute ages.

A lack of retrospective bias supports the model approach. The expected and observed size composition and expected and observed abundance indices are less supportive, but suggest the fit is adequate.

Once the working group is comfortable that growth rings can be reliably identified, transition matrices could be empirically based using methods similar to age-length keys. In the current form of the model, growth rings are only used to estimate variations in growth. Also, non-parametric density estimation should prove useful in modelling growth increment probability (Silverman 1986). This will reduce the assumptions based on the use of the growth model and gamma distribution for growth variability.

The model did not fit the catch size compositions particularly well. It would be useful to fit selectivity functions as separate factors, with a parameter for each size group. The factor parameter shape may suggest alternative functions to those used. If this shape is unrealistic or this approach cannot improve the fit to the length compositions, it is likely there is a problem in the population model.

The model linking CPUE to stock size takes into account the maximum processing rate on board vessels which will prevent the catch rate rising above some maximum.

Such models are useful and, where they can be verified, may provide a more accurate alternative to the usual linear function assumption. The main effect of this model will be to eliminate any relationship between the CPUE and stock size at higher catch rates. The model proposed appears to describe the data empirically, but unlike Holling's "disk equation", which is similar, does not have a theoretical foundation. The model should be verified by comparing it to the expected CPUE using independent estimates of the maximum processing rate.

Other models besides CASA still need to be considered. The working group should not use CASA to the exclusion of all alternatives. CASA does not deal explicitly with the closed areas, which have become an important component for the management of this species. Alternative simpler population models could provide better assessments and advice should management become more area specific. Alternative models giving generally the same advice also increases the confidence in the assessment.

Conclusions and Recommendations

The assessment was adequate in monitoring the stock, mainly as a result of the biomass survey. Because of uncertainty in the catch and growth, fishing mortality is poorly estimated and it is not possible to be sure overfishing is taking place.

A population model should be developed as soon as possible. The CASA approach appears to be a good basis for future assessments and development should continue as rapidly as possible.

The assessment areas should be split into mid-Atlantic and Georges Bank as a minimum. More finely divided zones should be considered. If rotational areas are being considered, zones could be managed separately, as long as joint spawning stock biomass is maintained. As biomass recovery is largely due to closed areas, spatial management would appear to be a good option for this stock.

Alternative models to CASA still need to be considered. For example, providing advice on rotating areas, as has been suggested, may ultimately require specific area assessments and fitting a size structured model may prove too onerous for this.

Bluefish

Findings

The current abundance indices appear to have significant problems. Regardless of the population model chosen for the assessment, indices will be necessary to fit a population model and monitor stock changes. This will be particularly important for monitoring recovery and claiming rebuilding targets are being met.

Uncertainty in catch needs to be taken into account in the stock assessment. The total recreational catch is estimated based on intercept interviews for random trips to obtain catch-per-unit-effort and a telephone frame survey. Unlike the CPUE index, the total catches are subject to additional error through imprecision in the total effort estimate. Fitting catches as well as abundance indices may improve the model fit and identify problems in the model.

Terceiro (2003) should be used as the foundation for the recreational CPUE abundance index, as much of the groundwork for developing an index has been completed in this study. Terceiro suggests using the year terms from a log-linear model with Poisson or negative binomial errors, with covariate factors for the State, mode, and wave. I would suggest Poisson quasi-likelihood as the simplest error model to apply (McCullagh and Nelder 1989). Interaction terms between the covariates other than the year should be checked, but only main terms for the year factor used. With adequate data, the index will be normally distributed, although the link function will still have to be applied.

Care must be taken when using a GLM index approach that information relevant to changes in stock size is not mistakenly removed. A better approach, in my opinion, is to integrate the GLM into the population model. This is often done where the parameter is "calculated" – that is the least squares equations for a linear model are solved by undertaking a separate rapid calculation rather than as part of the non-linear fitting process. This can be extended to linear models with more than one parameter. Lassen and Medley (2001) provide examples for using integrated linear models in fitting population models.

Other models besides a CPUE index should be considered. In particular, the catch equation allows effort to be linked to fishing mortality, which may be useful for giving management advice. The catch equation is itself a GLM with a complementary-log-log link function.

The survey index suffers from a number of problems. It is not directed at the bluefish stock, so the relationship with biomass may be noisy and/or non-linear. The survey may not cover the whole spatial range of the stock, so biomass fluctuations may not be detected. It tends to contain smaller bluefish, so that it is possible the survey may be better used as a recruitment index. Despite this, the survey index shows much the same pattern as the CPUE index.

The survey index also has four outliers in an otherwise relatively well behaved series. It is unclear how to deal with these points. It is unlikely that they represent any real signal of population change. It is possible that they are due to a few unusually abundant hauls. A more robust estimator than the mean may be more useful in providing an index where the species is not the target of the survey. The influence of these outliers should be tested in model fits.

Although both the CPUE and survey indices suffer problems, both should be used if possible. Both indices seem to describe a similar signal in the change in abundance. However, if the survey index contains predominantly recruits, it may prove inadequate as an indicator of biomass if the age structure is rebuilt. This should become clearer once both indices follow a recovery in the population.

Reducing fishing mortality to allow the abundance indices to increase will provide useful information on the productivity of the stock. A much improved assessment could be obtained when a recovery has taken place.

The model is very finely balanced. Small changes in the fitted parameters produce quite different behaviour in the model. The assessment results cannot be considered robust as they are heavily dependent on the model structure. The estimate for the r parameter seems high for this species. It is possible, for example, that the indices are not measuring the entire stock, but that there is additional biomass which is not being exploited. Whether the problem lies with the model or the indices, the results are too unreliable to use.

The bootstrap approach underestimates the uncertainty as the structure of the model leads to a very tight permissible parameter space. The results also implied a strong correlation between r and K parameters, typical for this model. This does not affect MSY estimates much (MSY = rK/4), but will affect other reference points and indicators such as B_{MSY}, making them very uncertain.

As the current assessment has been rejected, and the status of the stock is unknown, the total allowable landings specification may continue at current value. This could be the worst decision as the stock state is not likely to change and assessments will continue to be difficult with this species. It is arguable that a reduction in fishing mortality is warranted to obtain more information on the potential recovery of the stock size.

Conclusions and Recommendations

The commercial and recreational catch including landings and discards are estimated to an acceptable level for 1980-2003. Prior to 1980, the recreational catches are very poorly estimated. There was some uncertainty over recreational discard mortality, which could be addressed through tagging work.

The estimates of fishing mortality and total stock biomass for the current year were very uncertain. Without an adequate population model reference points could not be reassessed, the TAL estimate and stock projections are unreliable.

The stock has probably been depleted below B_{MSY}. Both independent population indices give broadly the same signal, indicating a substantial decline since the beginning of the series of approximately 50% and 25% for the CPUE and survey indices respectively. Given catches were not insignificant prior to this, the stock is probably below 50% of its unexploited state.

There is no real evidence that the stock is recovering. Neither index shows a clear increase. The logistic model fit is unstable due to the non-linearities in the model itself, which result in very poor performance in projecting the state of the population. The population model does not fit well and fishing mortality has not been reliably estimated. It is therefore not possible to know whether overfishing is taking place.

GLM models should be used to standardise CPUE indices following Terceiro (2003). If possible, all trips should be used and targeting should be allowed for as factor in the GLM.

Catches should not be presumed to be exact, but can be fitted through some likelihood function for discrepancies between observed and estimated catch in the population model. The likelihood can use the standard error of the catch estimate.

Both the CPUE and survey indices should continue to be used if possible. Both should be improved through further analysis to verify and/or improve the link between stock size and the index.

It would be useful to review the stock assessment methods used in other parts of the world for bluefish. These could indicate good long term approaches to monitoring this stock and avoid unnecessary mistakes.

The feasibility of a tagging programme should also be investigated. Given the relative success of the tagging program for black seabass, rapid information on the exploitation rate might be obtained from a tagging experiment for bluefish.

References

Boreman, J. 1983. Status of bluefish along the Atlantic coast, 1982. National Marine Fisheries Service, Northeast Fisheries Center, Woods Hole. Lab. Ref. Doc. No. 83-28.

Lassen, H. and Medley, P. 2001. Virtual Population Analysis. FAO Fisheries Technical Paper 400. FAO, Rome. 129p.

McCullagh P, Nelder JA (1989) Generalized linear models. Second Edition. Chapman and Hall, New York.

Manly, BFJ (1997) Randomization, Bootstrap and Monte Carlo Methods in Biology. Second Edition. Chapman and Hall, London.

Silverman, BW (1986) Density Estimation for Statistics and Data Analysis. Mongraphs on Statistics and Applied Probability 26. Chapman and Hall, London.

Terceiro, M. 2003. The statistical properties of recreational catch rate data for some fish stocks off the northeast US Coast. Fish Bull. 101:653-672.

Appendix 1: Panelists

Chair:

Dr Andrew I.L. Payne	(Centre for Environment, Fisheries and Aquaculture Sciences, Lowestoft, UK)

Panel members:

Dr Michael J. Armstrong	(Centre for Environment, Fisheries and Aquaculture Sciences, Lowestoft, UK)
Dr Din Chen	(International Pacific Halibut Commission, University of Washington, Seattle, USA)
Dr Paul Medley	(Consultant, Alne, UK)

Appendix 2: Terms of Reference

A. Black seabass

1. Characterize the commercial and recreational catch data (including length distributions).
2. Update Northeast Fisheries Science Center (NEFSC) survey indices and evaluate appropriate state survey indices.
3. Summarize tagging program results (NEFSC, Virginia, New Jersey).
4. Develop tag-based estimate(s) of exploitation.
5. Evaluate use of index-based methods for estimating relative Fs.
6. Re-evaluate biological reference points.

B. Sea scallop

1. Update status of the Georges Bank, Mid Atlantic Bight and Gulf of Maine sea scallop resources through 2003 using all applicable information fishery dependent information and fishery independent surveys (e.g. NEFSC trawl survey, SMAST video survey and others as appropriate). Provide estimates of fishing mortality and stock size. Characterize uncertainty in the estimates.
2. Evaluate stock status relative to current reference points.
3. Provide short_term projections of stock biomass and catches consistent with target fishing mortality rates.
4. Update estimates of biological reference points (e.g. B_{MSY}, F_{MSY}) using revised biological and fishery data, as appropriate.
5. Evaluate information provided by various current survey approaches and suggest possible ways to integrate their results.
6. Continue the development stock assessment modelling approaches that integrate all appropriate sources of fishery dependent and fishery-independent data.

C. Bluefish

1. Characterize the commercial and recreational catch, including landings and discards.
2. Estimate fishing mortality, spawning stock biomass, and total stock biomass for the current year and characterize the uncertainty of those estimates.
3. Evaluate and either update or re-estimate biological reference points, as appropriate.
4. Where appropriate, estimate a TAC and/or TAL based on stock status and target mortality rate for the year following the terminal assessment year.
5. If stock assessments are possible,
    a. provide short-term projections (2-3 years) of stock status under various TAC/F strategies, and
    b. evaluate current and projected stock status against existing rebuilding and recovery schedules, as appropriate.

Appendix 3: Agenda

39TH NORTHEAST REGIONAL STOCK ASSESSMENT WORKSHOP (SAW 39) STOCK ASSESSMENT REVIEW COMMITTEE (SARC) MEETING

Aquarium Conference Room - Northeast Fisheries Science Center

Woods Hole, Massachusetts

7-10 June 2004

Date and Subject	Presenter	Panel lead	Rapporteur
MONDAY, 7 June (13:00 – 17:30)			
Welcome	**John Boreman**, Center Director		
Introduction	**Terry Smith**, SAW Chairman		
Agenda & Conduct of meeting	**Andy Payne,** SARC Chairman		
Black Sea Bass (A)	**Gary Shepherd**	**Din Chen**	**Laurel Col**
SARC Discussion	**Andy Payne**		
TUESDAY, 8 June (08:30 - 18:00)			
Sea Scallop (B)	**Dvora Hart**	**Paul Medley**	**Larry Jacobson**
SARC Discussion	**Andy Payne**		
WEDNESDAY, 9 June (09:00 - 17:00)			
Bluefish (C)	**Jessica Coakley**	**Mike Armstrong**	**Laura Lee**
SARC Discussion	**Andy Payne**		
THURSDAY, 10 June (09:00 - finish)			
Close discussion and report preparation			

Appendix 4: Bibliography

A1: **Assessment of the Northern Stock of Black Sea Bass**. Consensus Assessment Summary and Report of the Coastal/Pelagic Working Group Report prepared for the Stock Assessment Review Committee (SARC), May 4, 2004. 3 pp. + 82 pp.

A2: **H. Black Sea Bass**. *In* 27th Northeast Regional Stock Assessment Workshop (27th SAW). Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. NEFSC Ref. Doc. 98-15.

B1: **Sea Scallop Assessment**. Summary and Report of the Invertebrate Subcommittee prepared for the Stock Assessment Review Committee (SARC), May 25, 2004. 3 pp. + 120 pp.

B2: **B. Sea Scallop Advisory Report**. *In* 32nd Northeast Regional Stock Assessment Workshop (32nd SAW). Public Review Workshop. NEFSC Ref. Doc. 01-04.

C1: **Bluefish Assessment**. Summary and Working Group Report of the ASFMC Bluefish Assessment Committee prepared for the 39th Stock assessment Review Committee (SARC), June 2004. 5 pp. + 63 pp.

C2: **C. Bluefish**. *In* 23rd Northeast Regional Stock Assessment Workshop (23rd SAW). Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. NEFSC Ref. Doc. 97-05.

Appendix 5: Statement of Work

Consulting Agreement between the University of Miami and Dr. Paul Medley

May 13, 2004

General

The Northeast Regional Stock Assessment Review Committee meeting (SARC) is a formal, multiple day meeting of stock assessment experts who serve as a peer-review panel for several tabled stock assessments. The SARC is the cornerstone of the Northeast Stock Assessment Workshop (SAW) process which includes peer assessment development (SAW Working Groups or ASMFC technical committees), assessment peer review, public presentations, and document publication.

Designee will serve as a panelist on the 39th Stock Assessment Review Committee panel. The panel will convene at the Woods Hole Laboratory of the Northeast Fisheries Science Center in Woods Hole, Massachusetts, the week of 7 June 2004 (7-10 June) to review assessments for sea scallop (*Placopecten magellanicus*), black sea bass (*Centropristis striata*), and bluefish (*Pomatomus saltatrix*).

Specific

A panelist's duties will occupy a maximum of 14 workdays; a few days prior to the meeting for document review; the SARC meeting; and a few days following the meeting to prepare a Review Report. The SARC Review Report will be provided to the SARC chair who will produce a SARC Meeting Report summarizing the individual Review Reports.

Roles and responsibilities:

(1) Prior to the meeting: review the Working Group Reports.

(2) During the meeting: participate, as a peer, in panel discussions on assessment validity, results, recommendations, and conclusions especially with respect to the adequacy of the assessments reviewed in serving as a basis for providing scientific advice to management.

(3) After the meeting: prepare an individual Review Report which provides an executive summary, a review of activities and, for each stock assessment reviewed, a summary of findings and recommendations which emerge from the findings, all in the context of responsiveness to the Terms of Reference for each assessment.

(4) No later than June 25, 2004, submit a written report[1] consisting of the findings, analysis, and conclusions, addressed to the "University of Miami Independent

[1] The written report will undergo an internal CIE review before it is considered final. After completion, the CIE will create a .PDF version of the written report that will be submitted to NOAA Fisheries and the consultant.

System for Peer Review," and sent to Dr. David Sampson, via e-mail to David.Sampson@oregonstate.edu and to Mr. Manoj Shivlani via e-mail to mshivlani@rsmas.miami.edu.

No consensus opinion between the CIE reviewers is sought and all SARC reports will be the product of the individual CIE reviewer or Chairperson.

Contact person:
Dr. Terrence P. Smith, NEFSC, Woods Hole, SAW Chairman, 508-495-2230, Terry.Smith@noaa.gov

ANNEX I: REPORT GENERATION AND PROCEDURAL ITEMS

1. The report should be prefaced with and executive summary of findings and/or recommendations.

2. The main body of the report should consist of a background, description of review activities, summary of findings, conclusions/recommendations, and references.

3. The report should also include as separate appendices the bibliography of all materials provided and a copy of the statement of work.