SARC#32: CHAIRMAN'S REPORT

by
Robin Cook
44 North Deeside Road
Bieldside
Aberdeen AB15 9DR
Email:cookrm@marlab.ac.uk

Preliminaries and Documentation

Once the agreement to chair the SARC had been made contact was established with the local organisers, Terry Smith, the SAW chairman, and Pie Smith. Arrangements were made to send relevant documents and preliminary discussions were held by phone on the conduct of the meeting.

Documents relating to the previous assessments of the stocks to be dealt with by SARC 32 were received approximately two weeks prior to the meeting. In addition a copy of the report of SARC 31 was received for information. These documents were reviewed in the lead up to the meeting.

On 21st November, draft working documents for the SARC 32 meeting were received. These consisted of more or less complete drafts for the assessments of American plaice, silver hake and haddock. A less complete draft of the sea scallop assessment was also received as well as further documents describing the application of a yield per recruit model to a rotational management scheme and a length based cohort analysis. At the start of the meeting another paper was received on a projection method for scallops.

After arrival in Falmouth, Massachusetts, a meeting was held on 26th November with the SAW chair on the meeting agenda, logistics and expectations for the meeting. On the morning of 27th November, further discussions were held with the SAW chair on details of the agenda, appointment of SARC leaders, rapporteurs and the handling of the sea scallop working documents. After additional discussion with the chair of the Invertebrate Sub-committee, Larry Jacobsen, agreement was reached on the order of presentation to simplify the SARC discussion.

Conduct of the meeting

The meeting commenced at 14:00hrs on the 27th November with all but one (SARC?) panel member present. This situation endured throughout the meeting. Various representatives of the fishing industry were present during most of the meeting.

For each stock, detailed presentations and any relevant supporting analysis were made by the assessment authors of the assessment. Following these presentations the panel discussed the science and, in all cases, requested additional analysis to be performed for clarification of results or data quality. Once this had been done and presented to the

Panel, assessment teams prepared draft advisory reports, and rapporteurs prepared draft SARC discussion summaries with research recommendations.

On the final two days of the meeting, the draft advisory reports and SARC discussion texts were discussed, with priority being given to the former. Discussion of the advisory reports, as might be expected, was lengthy and at times controversial. The principal areas of disagreement arose over the interpretation of 'agreed' harvest control rules which is discussed further below. Despite these disagreements, all the advisory reports and rapporteurs' summaries were edited and agreed during the meeting which closed at 16:00hrs on 1st December.

Stock Assessments

This section providesa brief overview of some of the main points relating to each stock. Since the SARC consensus summary (when is this due? i.e "pending, due on January 2001") will detail all the relevant scientific analysis, this report only refers to issues arising at the meeting.

American plaice: This was a standard age-structured ADAPT assessment tuned with four survey series. The main questions about the assessment related to the derivation of discard data and the sensitivity of the assessment to the different tuning series. Additional runs indicated that removal of the discard data did not affect the estimated stock trends and that the perceived state of the stock did not change. The additional runs also indicated that the Massachusetts surveys used in tuning the assessment contributed very little information and could probably be omitted. However, their inclusion in the analysis made very little difference to the results. Consequently, the ADAPT assessment was used as the basis for advice.

Sea scallops: The basic assessment used survey data and catch data to estimate indices of abundance and exploitation. The survey indices of abundance contained a strong unambiguous, increasing signal in both stock areas. The indices of exploitation were less straight-forward. Two estimates had been derived, one based on the ratio of catch to survey catch rate, and the other a Paloheimo F based on survey catch rates of two size groups of scallops. The latter was very noisy, while the former were less noisy but not necessarily scaled to true F. In order to get round these problems, the assessment team had calculated a third exploitation index by scaling the catch/survey index to the mean survey F. This third index generated a great deal of discussion since its validity was predicated on the assumption that the two initial indices followed the same trend. The similarity of trend was not immediately obvious. Further analysis requested by the SARC suggested that the new exploitation index was appropriate, at least for Georges Bank, and was ultimately used for the advisory report.

In addition to the basic assessment, the scallop assessment team presented a substantial amount of further material on length based assessment methodology and the estimation of survey gear efficiency. This work was both interesting and relevant to future assessments and the over-fishing definitions, but the SARC was not perhaps the most appropriate

forum to review this work. The work was endorsed (by whom? The panel?) as a useful way forward but did not have a direct influence on the current management advice. It is important to note, however, that the current over-fishing definitions are not appropriate for a stock managed on the basis of closed areas, and one of the papers (which one?) was particularly relevant to this point if rotational management is adopted.

Silver hake: In the past this species was assessed as two separate components. In recent years, there has been a shift in the relative balance of biomass between the northern and southern components. This change and uncertainties in the data, which result from stock mixing, led the assessment team to undertake a combined assessment. Two main assessment models were applied; a standard ADAPT analysis and a Bayesian surplus production model. The two methods gave opposite interpretations of the data. The ADAPT model suggested the stock is declining with increasing fishing mortality while the surplus production model indicated that the stock had undergone a period of recovery in the recent past and that the exploitation rate was low. The difference arose because the ADAPT formulation uses age composition data that show a decline in the relative proportions of older fish. This model therefore interprets the scarcity of older fish as an increase in fishing mortality rate. The change in the proportion of older fish may be due to a number of factors such as a change in the availability of older fish to the fishery and survey, age reading errors, increasing natural mortality rate or increasing exploitation rate. Clearly this will need to be an area of research if the assessment problems are to be resolved.

The assessment team preferred the surplus production model, while the SARC felt that neither model provided a reliable interpretation of the data given the uncertainties with the age composition data. Since the surplus production model does not use the age composition data, the problem is simply hidden. This led to some tension between the lead assessment author and the panel. In the end the advisory report simply pointed out the difficulties in judging the state of the stock with the conflicting information from the analyses. Advice was based on the survey indices since the agreed management reference points and harvest control rule are quantified in terms of the surveys.

Haddock: Only survey and catch data are available to assess this stock. Recent survey indices suggest that fishing mortality rate is lower and the stock higher than the recent past. Two issues arose from the assessment which related to the exploitation rate index and the calculation of reference points.

The exploitation rate index is simply catch divided by survey catch rate. Since the survey index is dominated by pre-recruits which are not represented in the catch, it was felt that the index could be misleading. Further analyses suggested that the exploitation rate index was indeed sensitive to the age range used in the survey catch rate. This problem will need to be investigated in the future to derive a more robust measure.

The ASPIC model used to establish the management reference points had been re-run with updated data and found to give rather different results to that obtained by the Over-fishing (should **O**ver-fishing be capitalized?) definitions panel. Further investigation

indicated that the results were quite sensitive to minor revisions of historical catch data. Also the addition of three new years of observations increased the contrast in the data which meant that greater precision could be achieved for some parameter estimates. The question then arose as to whether the management reference points and harvest control rule should be updated. It was decided not to do this for reasons discussed below.

Reference Points and Harvest Control Rules

Given the legislative background there is an obligation on the part of scientific advisors to evaluate the status of the stocks in relation to agreed over-fishing reference points which have been put forward by a panel of experts. In many cases these values have been used to set harvest control rules (HCRs). The resulting framework gives rise to two practical problems which relate to interpretation and consistency.

It was clear as the meeting progressed that the HCRs and their interpretation was not straight-forward. This was primarily due to the fact that neither the legal status of the HCRs nor the obligation of the SARC to apply them was yet established. Scientists on the SARC preferred to provide advice strictly in accordance with agreed HCRs. The managers represented on the panel, however, preferred advice to be given based on the best professional judgement on the current state of the stock. The difference of approach is interesting if only from a sociological point of view. If managers have adopted a strategy, scientists prefer to see that responsibility accepted by managers and therefore simply want to provide the relevant numbers. Conversely, when the consequences of the strategy emerge, managers prefer to maintain as much room for manoeuvre as possible, and thus seek the best current perception of stock status. Eventually, advice was formulated by indicating were (where?) the stock was in relation to agreed reference values and the implied management action resulting from the application of the HCR. Additional comments were offered where appropriate particularly if reference points and HCRs appeared weakly supported by the assessment. In the future it would highly desirable to clarify the legal status of the HCRs and the obligation of scientists to apply them when giving advice.

The other difficulty which affects the application of HCRs is that in most cases the rules have not been formally evaluated but are simply derived from the over-fishing definitions using expert judgement. It means that re-calculation of the over-fishing reference values implies a new HCR. This is not a very satisfactory situation. Where formal management procedures have been applied by the International Whaling Commission and in Australia and South Africa, for example, HCRs have been evaluated against defined performance criteria through extensive simulation and the resulting rule need not have embedded within it the over-fishing definitions. This means the rule is chosen to be insensitive to a variety of sources of uncertainty (including the estimation of reference points) and may be independent of particular values, such as B_{msy}. Consequently the application of the rule is transparent and depends only on making certain measurements of the stock. At SARC 32 is was clear that when an attempt was made to apply HCRs, the implied management action was unpalatable and did not necessarily accord with the perceived state of the stock. It was further complicated by the fact that revised estimates of the

over-fishing values imply a revised HCR which is inconsistent with the theory of management procedures. Changing the HCR in the light of revised estimates leads to unstable advice and should be avoided. The core of the problem is that the derivation of the HCR must be independent of the assessment process, not contained within it. This ambiguity needs to be resolved.

Observations on the SARC process

The SARC attempts to do two things. First, it acts as a peer review panel for the stock assessments to ensure quality. Second, it prepares consensus advice to managers. These two tasks are clearly sequential, and the SARC appears to complete them well. An important strength of the meeting is that it is open, which means a greater range of expertise can be brought to the meeting and that decision making is reasonably transparent. No system is perfect, and there are some points which are worth reflecting on, even if no major changes are felt necessary.

Peer review: In my view insufficient time was given to thorough review of the assessments which contributed to the advice. This was because the working documents became available to the panel only a few days before the meeting and in one case was incomplete. At least two of the documents were long and would have required a much more time to digest than was possible. The problem was also made a little more difficult due to the fact the when the documents were presented at the meeting considerable time was given to the presentations which were highly detailed. Due to this limited discussion time and the detail of the material, there was a tendency to obscure the main issues. My preference would be for the working documents to be made available at least two weeks before the meeting so that panellists could fully assimilate the analyses. Presentation at the meeting could then be less detailed and concentrate on the main issues to set up the panel discussion. Adopting such an approach requires a lot of self discipline by the assessment teams as the tendency is always to keep working until the last minute to squeeze every ounce of information from the data. However, in so doing, downstream work can be adversely affected.

Advice preparation: The preparation of advice is always difficult in the face of scientific uncertainty and the political context in which management inevitably occurs. The composition of the SARC is such that a wider range of expertise than simply science is represented. This adds to the tensions in arriving at a consensus but has to be accepted as part of the process. There are strengths and weaknesses in having this broader participation. On the plus side, the presence of those involved in management means that scientists better understand management needs and can offer more relevant advice. Equally, managers gain a better insight into the reasons behind the advice and may therefore interpret it with more understanding. It works well, as on this occasion, when the personalities involved are constructive. On the negative side there is a danger that scientific objectivity is compromised in favour of political expediency. This problem did arise at the meeting, particularly when the validity of an HCR was called into question. As someone new to the context, I was not able to judge how neutral the final advice was and this is clearly a potential problem which needs to be watched. In the long run,

scientific advice will only be credible if it is seen to be objective.

Accredited software: Some of the assessment software used in the analyses is tried and tested. This is true, for example in the case of the ADAPT software. Where new methods are applied using *ad hoc* software, such as the silver hake surplus production model, there needs to be a process to ensure that the program does what it is supposed to and is error free. This does not imply that there was a fault in the software, merely that as far as I know, no formal verification had been carried out. Unfortunately errors do occur which can go unnoticed until it is too late. These are the kind of errors the SARC may well not detect. It would be desirable to establish a quality protocol to ensure that any new software used in assessments meet certain standards so that the risks of errors are minimised.

STATEMENT OF TASK

Consulting Agreement between the University of Miami and Robin Cook

October 23, 2000

General

The Stock Assessment Review Committee meeting (SARC) is a formal, one-week long meeting of a group of stock assessment experts who serve as a peer-review panel for several tabled stock assessments. It is part of the overall Northeast Stock Assessment Workshop (SAW) process which also includes peer assessment development (SAW Working Groups), public presentations, and document publication within a cycle that lasts six months. The panel is made up of some 12-15 assessment scientists: 4 scientists from the NEFSC; a scientist from the Northeast Regional office, scientists from the staff of the New England and Mid-Atlantic Fishery Management Councils, and Atlantic States Marine Fisheries Commission and additional panelists from state fisheries agencies, academia (US and Canada), and other federal research institutions (US and Canada).

Designee will serve as chairman of the 32nd Stock Assessment Review Committee panel. The panel will convene at the NEFSC in Woods Hole the week of 27 November (27 November - 1 December, 2000) and review assessments for sea scallop, silver hake, Gulf of Maine haddock and American plaice.

Specific

(1) Prior to the meeting: become familiar with the working papers produced by the SAW Working Groups (total number not final; there will be at least one per stock);

(2) During the meeting: Act as chairperson where duties include control of the meeting, coordination of presentations and discussion, control of document flow;

(3) After the meeting: Facilitate the preparation and writing of a Draft Advisory Report and Consensus Summary Report by NMFS personnel. Panelists, NEFSC staff and the SAW Chairman will ensure that documents are made available to the SARC chair, revised according to the SARC Chair's directions, compiled, copied and distributed;

(4) Review the final Draft Advisory Report and Consensus Summary Report.

(5) No later than January 8, 2001, submit a chair report detailing the major events, results, and conclusions of the meeting. The report should be addressed to the "UM Independent System for Peer Reviews, " and sent to David Die, UM/RSMAS, 4600 Rickenbacker Causeway, Miami, FL 33149 (or via email to ddie@rsmas.miami.edu).

The SAW Chairman and SAW Coordinator will assist the Chair prior to, during and after the meeting in ensuring that documents are distributed in a timely fashion. The SARC Chair will be solely responsible for the editorial content of the reports.

The Chair's duties will occupy a total of two weeks - several days prior to the meeting for document review; the week long meeting; and several days following the meeting to ensure that the final documents are consistent with the SARC's recommendations and advice.

Contact persons: Dr. Terrence P. Smith, NEFSC, Woods Hole, SAW Chairman, 508-495-2230
Mary Jane Smith, NEFSC, Woods Hole, SAW Coordinator, 508-495-2370

Signed_____ Date_____

Robin Cook

BUDGET

1. Salary ($600 per day for 14 days)	$8,400
2. Plane fare (estimated)	$800
3. Lodging (6 nights)	$750
4. Meals ($30 per diem for 7 days)	$210
5. Car rental ($50 for 7 days)	$350
6. Miscellaneous travel	$100
TOTAL	$10,610