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ADDITIONAL COMMENTS TO CIE SUMMARY REPORT FOR SARC 42

BY
Dr Andrew I.L. Payne
International Fisheries Consultant

Subsequent to the completion of the CIE final report, I was asked by Dr. Jim Weinberg of NOAA to summarize more clearly the scientific performance/success against each Term of Reference in terms of the Charge to the Panel (Appendix 2 of CIE summary report). This I did, emphasizing the conclusion of the panel in Section 4 below in italics.

1 Executive Summary and Recommendations

For *silver hake*,

Overall, scientific performance against the Terms of Reference was not good, in many cases for good reason, so there remains much to be done before the science and assessment can credibly form the basis of management advice developed for this stock.

For *Atlantic mackerel*,

All Terms of Reference were adhered to as closely as feasible, and the panel was satisfied to support the scientific input to any management advice that will be developed from the assessment.

In terms of shortfin squid,

Effort had been made to address all Terms of Reference, although the absence of an acceptable model to support the development of management advice hampered progress against some, especially those pertaining to reference thresholds and short-term predictions.

For the *predator-prey MSVPA-X model*,

All Terms of Reference were well met.

4. Substantive Summary Report

A2 Discussion relative to Terms of Reference SILVER HAKE

1. Characterize the commercial and recreational catch including landings and discards

The work carried out is acceptable scientifically in terms of proper use of data and modelling, although the panel felt that further investigation may cast doubt on some of the conclusions reached on this occasion. As a basis for developing management advice, however, landings and discard data are as good as could be expected.

2. Estimate fishing mortality, spawning stock biomass, and total stock biomass for the current year and characterize the uncertainty of those estimates. If possible, also include estimates for earlier years

The panel was not convinced that the information provided and the analyses conducted allowed this Term of Reference to be completed adequately. Certain models attempted were not appropriate, and overall the conclusion reached on stock status was considered to be inappropriate. Until this issue has been addressed, it is unlikely that scientifically defensible inputs to management advice development can be produced.

3. Evaluate and either update or re-estimate biological reference points, as appropriate

This Term of Reference was not addressed, and the panel concluded that alternative threshold indices need to be sought for the stock urgently. Only then can a sound and credible scientific basis be provided to those charged with developing management advice.

4. As needed by management, estimate a single-year or multi-year TAC and/or TAL by calendar year or fishing year, based on stock biomass and target mortality rate

This Term of Reference was therefore not completed, and cannot be at present.

5. If possible,

a. provide short term projections (2–3 years) of biomass and fishing mortality rate, and characterize their uncertainty, under various TAC/F strategies, and

b. evaluate current and projected stock status against existing rebuilding or recovery schedules, as appropriate

This Term of Reference was therefore not completed, and cannot be at present.

6. Review, evaluate and report on the status of the SARC/Working Group Research Recommendations offered in previous SARC-reviewed assessments

Two of the previous five SARC recommendations were followed, with different levels of success. Of the other three research recommendations, which were not investigated, the

panel only considered one still valid, and instead offered those below for consideration by the scientific researchers.

B2 Discussion relative to Terms of Reference: ATLANTIC MACKEREL

1 Characterize the commercial and recreational catch including landings and discards

Scientifically, this Term of Reference was well addressed, only discarding levels remaining open to question. Data and modelling were well presented, and the conclusions reached, which will form the basis of management advice to be developed, are fair given the current state of knowledge of the stock.

2 Estimate fishing mortality, spawning stock biomass, and total stock biomass for the current year and characterize the uncertainty of those estimates. If possible, also include estimates for earlier years

The panel concluded that sensible advances had been made with the scientific analyses of this stock since the last assessment, although retrospective analysis still shows bias in SSB and F in recent years, undermining the plausibility of the output parameters. The Term of Reference was therefore in large part addressed.

3 Evaluate and either update or re-estimate biological reference points, as appropriate

Despite the contrasting views of some stakeholders present, the panel felt that this Term of Reference had been addressed well and that the output provided a scientifically credible basis on which future management advice can be constructed. What is needed, however, is a full risk analysis along with consideration of the various uncertainties present in the assessment.

4 As needed by management, estimate a single-year or multi-year TAC and/or TAL by calendar year or fishing year, based on stock biomass and target mortality rate

The scientists responsible for the assessment tried hard to fulfil this Term of Reference in a scientifically defensible manner, falling short only in the lack of provision of uncertainty estimates. However, the panel concluded that this Term of reference was satisfied.

5 If possible, a. provide short term projections (2–3 years) of biomass and fishing mortality rate,

- and characterize their uncertainty, under various TAC/F strategies, and
b. valuate current and projected stock status against existing rebuilding or recovery schedules, as appropriate

Term of Reference 5b does not apply to this stock, but apart from the lack of uncertainty statements, the panel was satisfied that the scientists addressed this Term of Reference adequately.

- 6 Review, evaluate and report on the status of the SARC/Working Group Research Recommendations offered in previous SARC-reviewed assessments

Therefore, in respect of performance against this Term of Reference, the scientists are deemed by the panel to have succeeded, or explained the outcome as negative, except for one recommendation. Those recommendations still considered valid for the future are listed along with other suggestions in the section below.

C2 Discussion relative to Terms of Reference: SHORTFIN (ILLEX) SQUID

1 Characterize the commercial and recreational catch including landings and discards

The panel was satisfied that the scientists addressed this Term of Reference adequately, and that the information was currently the best available.

2 Estimate fishing mortality, spawning stock biomass, and total stock biomass for the current year and characterize the uncertainty of those estimates. If possible, also include estimates for earlier years

Shortfin squid assessment is vastly different from that for finfish, so this Term of Reference could only be satisfied in a preliminary manner. The modelling is impressive and rigorous, and significant advances have been made, but difficulties with age determination of squid remain, so it should not be a surprise to anyone to read that the F and stock biomass values obtained are not suitable yet for use by managers.

3 Evaluate and either update or re-estimate biological reference points, as appropriate

This Term of Reference cannot be achieved given the dynamics of the species. Therefore, despite commendable scientific effort by those responsible, the revised reference points must only be regarded as preliminary, even if they are better scientifically than those currently in place.

4 As needed by management, estimate a single-year or multi-year TAC and/or TAL by calendar year or fishing year, based on stock biomass and target mortality rate

The model used by the scientists for this assessment, and the dynamics of the species in question, do not allow this calculation to be made, so this Term of Reference was not achieved. Other forms of management should be sought for squid.

5 If possible,

- a. provide short term projections (2–3 years) of biomass and fishing mortality rate, and characterize their uncertainty, under various TAC/ F strategies, and
- b. evaluate current and projected stock status against existing rebuilding or recovery schedules, as appropriate

Term of Reference 5b is not applicable, and the models to underpin short-term projections for shortfin squid have not been developed. Therefore, unsurprisingly, this Term of Reference was not satisfied.

6 Review, evaluate and report on the status of the SARC/Working Group Research Recommendations offered in previous SARC-reviewed assessments

The scientist corps responsible for shortfin squid research and assessment fulfilled this Term of Reference commendably, failure to address some being solely attributable to

simple data inadequacy or funding shortfall. Other suggestions for future work are given below.

D2 Discussion relative to Terms of Reference: MSVPA-X MODEL

1. Evaluate adequacy and appropriateness of model input data, including fishery-dependent data, fishery-independent data, selectivities, etc. as configured

This Term of Reference was completed as far as the current model is concerned. Although a few questions remain, data were well used, analyses and models well applied, and the conclusions seem reasonable. At present, however, the output from this work is not appropriate for use by those who provide fishery management advice directly.

2. Evaluate assumptions for data gap filling when reliable data are not available (diet, biomass of prey species, feeding selectivity)

The panel was satisfied that this Term of Reference was rigorously and satisfactorily addressed.

3. Review model formulation (overall setup, data handling, VPA calculations, assessment options, sensitivity analyses, recruitment model options, and forward projection options) of model as configured

The scientists fully addressed the needs of this Term of Reference, and it was pleasing to see the results of the sensitivity runs presented so clearly.

4. Develop research recommendations for data collection, model formulation, and model results presentation

Those charged with the multispecies research and modelling provided an extensive and well-considered prioritized list of future research recommendations to fulfil this Term of Reference.

5. Evaluate whether or not the model and associated data are of sufficient quality to develop recommendations to management

This Term of Reference was fulfilled satisfactorily, and the panel aligns itself with the findings.