Biomass estimates for use in initial sardine and anchovy TAC/B computations for 2013 should the November 2012 survey not be completed successfully

de Moor, C.L.[*] and Butterworth, D.S.[*]

Correspondence email: carryn.demoor@uct.ac.za

Existing Rules

The following (see de Moor *et al*. 2010) is the rule previously agreed by the Small Pelagic Working Group to be used to effect TAC and TAB recommendation computations in the event of a November small pelagic spawner biomass survey not being completed successfully.

"In the event of no survey taking place, sufficient time would be available before the TAC recommendations are required to enable updates of the latest sardine and anchovy assessments (results at the posterior mode only). Retrospective runs would be carried out for the past ±6-8 years to compare the difference between the model predicted November 1+ biomass (including estimated bias) and the survey observation in each final year. The model predicted November 2010 1+ biomass (with estimated bias) will then be reduced by either the maximum difference between these historic model predictions and survey estimates, or one standard error of the projection estimate, whichever is greater. This reduced estimate of 1+ biomass will be used to input into the OMP-08 formulae to calculate the directed sardine and initial anchovy TACs and initial sardine TAB for 2011."

Implementation Procedure for 2012

At this time it is immediately possible to provide results from one of these two approaches. In the process of generating operating models for resource projections from 2013 for the testing of a revised OMP, a best assessment (base case operating model) for each the sardine and anchovy populations has been developed using data up to and including those from the November 2011 survey. In using these results to initiate projections, the May 2012 recruit survey results and 2012 catches as best estimated at this time have been taken into account in estimating recruitments for 2012 and projecting biomasses forward to November 2012 (de Moor and Butterworth, 2012). This process is exactly the "updated assessment" required above, except in the minor respect that the most recent spawning stock/recruitment data pair are not taken into account in estimating the stock-recruitment relationship that contributes to shrinking the observed estimate of recruitment towards that relationship in the inverse weighting procedure used in de Moor and Butterworth (2012).

[*] MARAM (Marine Resource Assessment and Management Group), Department of Mathematics and Applied Mathematics, University of Cape Town, Rondebosch, 7701, South Africa.

This process provides a distribution for the expected biomass of each population in November 2012, and also of the biomass estimates that would be expected to result from a November 2012 survey (Figure 1). The procedure above related to a no-survey situation speaks of the estimate reduced by one standard error. Since here full posterior distributions are produced, and in the spirit of an "estimate less one standard error" corresponding to the lower 16%-ile of a Normal distribution, results below correspond to that %-ile.

Results

Application of this procedure yields the following, where the 50%-ile (median) is the result to be expected from the survey, and the 16%-ile is the precautionary value which would be used should the survey not be completed successfully:

Sardine:	50%-ile	937 134 t
	16%-ile	505 345 t
Anchovy	50%-ile	1 005 345 t
	16%-ile	491 066 t

Note that were the alternative "retrospective" procedure above (which would be time-consuming) to be carried out, resultant final estimates of abundance could only be lower the 16%-ile values given above.

Reference

de Moor, C.L., and Butterworth, D.S. 2012. The simulation testing framework used during the development of OMP-13. DAFF: Branch Fisheries Document FISHERIES/2012/NOV/SWG-PEL/58. 24pp.

de Moor, C.L., Butterworth, D.S., and Coetzee, J.C. 2010. Proposed rules to determine inputs to the OMP should there be no hydro-acoustic survey result in November 2010 or May 2011. Marine and Coastal Management Document MCM/2010/SWG-PEL/42. 2pp.

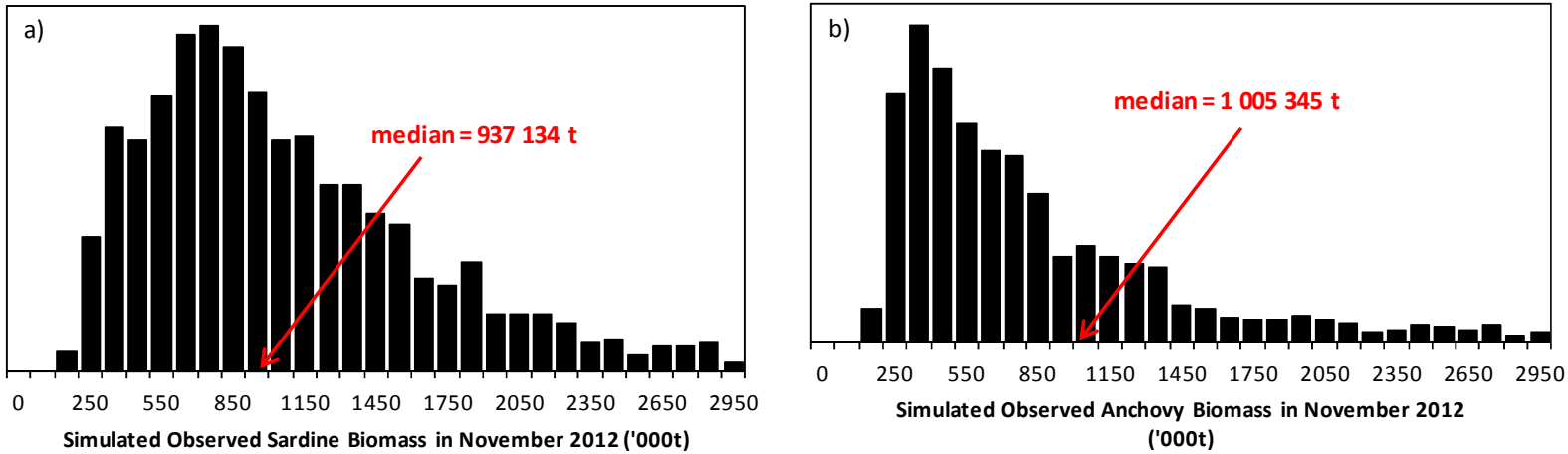

Figure 1. The posterior distribution of the model predicted survey estimate of 1+ biomass in November 2012 for a) sardine and b) anchovy.