Initial Sardine and Anchovy TACs and Sardine TAB for 2009, Using OMP-08

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Following the recent 2008 spawner biomass survey, the initial 2009 TACs for South African sardine and anchovy and initial sardine TAB are to be recommended. The following data have been used:

1) November 2008 survey sardine 1+ biomass: 384 080 tonnes.
2) November 2008 survey anchovy spawner biomass: 3 705 893 tonnes.
3) Directed sardine TAC for 2008: 90 776 tonnes.
4) Directed anchovy normal season TAC for 2008: 397 500 tonnes[1].

Using the above data, the initial 2009 TACs and TAB recommendations are calculated by OMP-08 to be:

Directed sardine TAC: 90 000 tonnes

Initial normal season anchovy TAC: 299 437 tonnes

Initial normal season sardine TAB: 33 961.6 tonnes

The equations used to calculate these TAC/Bs are given in the Appendix.

Comments on the TACs

The directed sardine TAC is constrained by the minimum in the absence of Exceptional Circumstances. Note that given that Exceptional Circumstances do not apply, the directed sardine TAC recommendation is final and for the whole season, rather than an initial figure to be revised in mid-year.

The data are such that the anchovy normal season TAC was not subject to any constraints.

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References

de Moor, C.L. and D.S. Butterworth. 2008. OMP-08. MCM document, MCM/2008/SWG-PEL/23. 15pp.

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[1] The total anchovy TAC for 2008 was 517 500t, comprising of 397 500t for the normal season and 120 000t for the additional season.

Appendix: Summary of Initial TAC and TAB Equations of OMP-08 (from de Moor and Butterworth 2008).

The directed sardine TAC is initially calculated in proportion to the 2008 November 1+ biomass estimate:

$$TAC_y^S = \beta \, B_{y-1,Nov}^S \tag{A.1}$$

This results in $TAC_y^S = 37\,256\,t$. As the biomass estimate is above the exceptional circumstances threshold of 300 000t, but below 800 000t, and because the TAC in 2008 is below the 2-tier threshold, the TAC decreases linearly from the constraint of a maximum 20% decrease from the 2008 directed sardine TAC down to a minimum (being the maximum of either $c_{mntac}^S = 90\,000\,t$ or the result of equation (A.1)). Letting $TAC_y^{S*} = \max\{37\,256t; c_{mntac}^S\}$, the constraints are given as follows:

$$\max\left\{ \left(1 - c_{mxdn}^S\right)TAC_{y-1}^S \times \frac{B_{y-1,Nov}^S - B_{ec}^S}{B* - B_{ec}^S} + TAC_y^{S*}\frac{B_{smooth}^S - B_{y-1,Nov}^S}{B_{smooth}^S - B_{ec}^S}; c_{mntac}^S \right\} \leq TAC_y^S \leq c_{mxtac}^S \tag{A.2}$$

The above constraints result in $TAC_y^S = 90\,000\,t$. In the above equations we have:

$\beta = 0.097$ - a control parameter reflecting the proportion of the previous year's November 1+ biomass index of abundance that is used to set the directed sardine TAC.

$B_{y,Nov}^S$ - the estimate of sardine 1+ abundance (in thousands of tonnes) from the hydroacoustic survey in November of year y.

$c_{mxdn}^S = 0.20$ - the maximum proportional amount by which the directed sardine TAC can be reduced from one year to the next.

$c_{mntac}^S = 90\,000\,t$ - the minimum directed TAC that may be set for sardine.

$c_{mxtac}^S = 500\,000\,t$ - the maximum directed TAC that may be set for sardine.

$B_{ec}^S = 300\,000t$ - the biomass threshold below which Exceptional Circumstances apply for sardine.

$B_{smooth}^S = 800$ - the threshold (in thousands of tonnes) below which the directed sardine TAC may be reduced by more than c_{mxdn}^S from one year to the next.

The directed anchovy initial TAC is based on how the 2008 November spawner biomass survey estimate of abundance relates to the historic (pre-2000) average.

$$TAC_y^{1,A} = \alpha_{ns} \, \delta \, q \left(p + (1-p)\frac{B_{y-1,Nov}^A}{\bar{\bar{B}}_{Nov}^A} \right) \tag{A.3}$$

This results in $TAC_y^{1,A} = 299\,437\,t$. The anchovy TAC is subject to similar constraints as apply for sardine. As the normal season TAC in 2007 was above the 2-tier threshold, the following constraint applies:

$$\left(1 - c_{mxdn}^A\right)c_{tier}^A \leq TAC_y^{1,A} \leq c_{mxtac}^A \tag{A.4}$$

This results in an unchanged $TAC_y^{1,A} = 299\,437\,\text{t}$. The anchovy biomass estimated by the November survey is above the Exceptional Circumstances threshold and thus no Exceptional Circumstances provisions were invoked. In the above equations we have:

$B_{y,Nov}^A$ - the estimate of anchovy abundance (in thousands of tonnes) from the hydroacoustic spawner biomass survey in November of year y.

$\overline{B}_{Nov}^A$ - the historic average index of anchovy abundance from the spawner biomass surveys from November 1984 to November 1999, of 1 380.28 thousand tonnes.

$\alpha_{ns} = 0.78$ - a control parameter which scales the anchovy TAC to meet target risk levels for sardine and anchovy.

$\delta = 0.85$ - a 'scale-down' factor used to lower the initial anchovy TAC to provide a buffer against possible poor recruitment.

$p = 0.7$ - the weight given to the recruit survey component compared to the spawner biomass survey component in setting the anchovy TAC.

$q = 300$ - reflects the average annual TAC expected under OMP99 under average conditions if $\alpha_{ns} = 1$.

$c_{mxdn}^A = 0.25$ - the maximum proportional amount by which the normal season directed anchovy TAC can be reduced from one year to the next (note that the additional season anchovy TAC is not taken into consideration in this constraint).

$c_{mxtac}^A = 600\,000\,t$ - the maximum directed TAC that may be set for anchovy.

The initial sardine TAB is calculated using:

$$TAB_y^{1,S} = \gamma_y\,TAC_y^{1,A} + TAB_{rh}^S \tag{A.5}$$

where: $\gamma_y = 0.1 + \dfrac{0.1}{1 + \exp\left(-\dfrac{1}{0.1}0.00025\left(B_{y-1,Nov}^S - 2000\right)\right)} = 0.102$

In the above equations we have:

$TAB_{rh}^S = 3500\,\text{t}$- the fixed tonnage of adult sardine bycatch set aside for the round herring fishery each year.

γ_y - a conservative allowance for the ratio of juvenile sardine to juvenile anchovy in subsequent catches.