Directed Sardine and Initial Anchovy TACs and Sardine TAB for 2012, Using OMP-08

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Following the recent 2011 spawner biomass survey, the initial 2012 TACs for South African sardine and anchovy and initial sardine TAB are to be recommended. The following data have been used:

1) November 2011 survey sardine 1+ biomass: 1 037 060 tonnes.

2) November 2011 survey anchovy spawner biomass: 754 124 tonnes.

3) Directed sardine TAC for 2011: 90 000 tonnes.

4) Directed anchovy normal season TAC for 2011: 270 291 tonnes[1].

Using the above data, the initial 2012 TACs and TAB recommendations are calculated by OMP-08 to be:

Directed sardine TAC: 100 595 tonnes

Initial normal season anchovy TAC: 202 718 tonnes

Initial normal season sardine TAB: 25 446.6 tonnes

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

Comments on the TACs

The directed sardine TAC was not subject to any constraints. Note that because 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 anchovy initial normal season TAC is constrained by the maximum decrease (of 25%) from the 2011 normal season TAC. Exceptional Circumstances do not apply.

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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 2011 was 390 291t, comprising of 270 291t 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 2011 November 1+ biomass estimate:

$$TAC_{2012}^{S} = \beta \, B_{2011,Nov}^{S} \tag{A.1}$$

This results in $TAC_{2012}^{S} = 100\,595\,t$. As the biomass estimate is above 800 000t, and because the TAC in 2011 is below the 2-tier threshold, the following constraint applies:

$$\max\left\{\left(1 - c_{mxdn}^{S}\right)TAC_{2011}^{S} ; c_{mntac}^{S}\right\} \leq TAC_{2012}^{S} \leq c_{mxtac}^{S} \tag{A.2}$$

The above constraints result in $TAC_{2012}^{S} = 100\,595\,t$. 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.

$c_{mntac}^{S} = 90$ — the minimum directed TAC (in thousands of tonnes) that may be set for sardine.

$c_{mxtac}^{S} = 500$ — the maximum directed TAC (in thousands of tonnes) that may be set for sardine.

$c_{tier}^{S} = 255$ — 2-tier threshold for directed sardine TAC

$B_{ec}^{S} = 300$ — the biomass threshold (in thousands of tonnes) 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 2011 November spawner biomass survey estimate of abundance relates to the historic (pre-2000) average.

$$TAC_{2012}^{1,A} = \alpha_{ns} \, \delta \, q \left(p + \left(1 - p\right)\frac{B_{2011,Nov}^{A}}{\overline{B}_{Nov}^{A}} \right) \tag{A.3}$$

This results in $TAC_{2012}^{1,A} = 171\,831\,t$. The anchovy TAC is subject to similar constraints as apply for sardine. As the normal season TAC in 2011 was below the 2-tier threshold, the following constraint applies:

$$\max\left\{\left(1 - c_{mxdn}^{A}\right)TAC_{2011}^{2,A} ; c_{mntac}^{A}\right\} \leq TAC_{2012}^{1,A} \leq c_{mxtac}^{A} \tag{A.4}$$

This results in $TAC_{2012}^{1,A} = 202\,718\,\text{t}$. 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).

$c_{mxtac}^A = 600$ - the maximum directed TAC (in thousands of tonnes) that may be set for anchovy.

$c_{tier}^A = 330$ - 2-tier threshold for directed anchovy TAC

The initial sardine TAB is calculated using:

$$TAB_{2012}^{1,S} = \gamma_{2012}\, TAC_{2012}^{1,A} + TAB_{rh}^{S} \qquad\qquad (A.5)$$

where: $\gamma_{2012} = 0.1 + \dfrac{0.1}{1 + \exp\left(-\dfrac{1}{0.1}0.00025\left(B_{2011,Nov}^{S} - 2000\right)\right)} = 0.108$

In the above equations we have:

$TAB_{rh}^{S} = 3\,500\,\text{t}$ - 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 in year y.