# List of alternatives to be tested during the development of OMP-13

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Introduction

A number of alternative scenarios have already been requested to be explored during the development of OMP-12. These are listed (with comments) in Table 1, together with some suggestions for constraints which may also need to be revised. Scenarios which are not relatively straightforward, i.e. that require further clarification and/or coding, are given in *italics*. A column is included to indicate whether it is intended to consider investigating the scenario during the development of OMP-12.

References

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

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**Table 1.** A list of the alternative scenarios which have been requested to be explored during OMP-12 development. The final column is left empty for all scenarios which at this stage are planned for simulation testing during the development of OMP-12.

<table>
<tr><td></td><td>Detail of request</td><td>Comments / Requirements / How this will be implemented</td><td>To be attempted?</td></tr>
<tr><td>1.</td><td>(From SAPFIA) Keep all the risks and constraints in OMP08 constant, except to vary $\beta$, the directed sardine control parameter according to the following table:
<table>
<tr><th colspan="2">Control Parameter</th><th>OMP-99</th><th>OMP-02</th><th>Re-Revised OMP-04</th><th>OMP-08</th></tr>
<tr><td>$\beta$</td><td>directed sardine control parameter</td><td>0.1375</td><td>0.1865</td><td>0.14657</td><td>0.097</td></tr>
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The rationale for this is that increasing $\beta$ lowers the level of sardine biomass at which the current 90 000 t minimum constraint comes into play, and assuming a continued recovery in the sardine stock, a quicker benefit to the industry stemming from this recover; and to assess the inevitable long-term effect on the harvesting of anchovy that such scenario's would necessarily entail (through it's effect on $\alpha_{ns}$).</td><td>The trade off curve produced shows the average expected directed sardine and anchovy catches for the full range of possible $\beta$ s</td><td></td></tr>
<tr><td>2.</td><td>(From SAPFIA) The same scenario's as for 1 above, but giving up the two-tier system for both anchovy and sardine.</td><td></td><td></td></tr>
<tr><td>3.</td><td>(From SAPFIA) The same scenario as for 2 above, but also decreasing the anchovy minimum TAC to 100 000 t.</td><td>(see 9 below)</td><td></td></tr>
<tr><td>4.</td><td>(From SAPFIA) The same scenario as for 3 above, but now also decreasing the maximum anchovy normal season TAC to 350 000 t.</td><td>(see 9 below)</td><td></td></tr>
<tr><td>5.</td><td>(From SAPFIA) The same scenarios as above, but decreasing the maximum sardine TAC to 250 000 t for each scenario.</td><td></td><td></td></tr>
<tr><td>6.</td><td>(From SAPFIA) Allowing the A-season to run until the end of September instead of the end of August</td><td>This is not straightforward as the equations and assumptions for simulation of catch and bycatch from September to December need to be developed</td><td></td></tr>
<tr><td>7.</td><td>(From SAPFIA) The same scenarios as above, but doing away with the two-season split for anchovy, with the anchovy TACs (initial and final) for the year running over the course of the entire year. (Doing away completely with the B-season)</td><td>This is not straightforward as the equations and assumptions for simulation of catch and bycatch from September to December need to be developed</td><td></td></tr>
<tr><td>8.</td><td>Sardine minimum and maximum TACs</td><td>Maximum = 500 000t. Try 250 000t (see 5 above)<br>Minimum = 90 000t. Decrease?</td><td></td></tr>
<tr><td>9.</td><td>Anchovy minimum and maximum TACs</td><td>Maximum = 600 000t. Decrease due to a reduction in daily processing capacity, new emissions policy etc<br>Note this currently applies to annual TAC. We should change this to apply to the normal season only (and additional season has its own maximum, see below).<br>Currently this would be 600 000t – 120 000t = 480 000t. Try 350 000t (see 4 above)<br>Minimum = 120 000t. Try 100 000t (see 3 above)</td><td></td></tr>
<tr><td>10.</td><td>Maximum normal season increase in anchovy TAC</td><td>Maximum = 150 000t. Is this feasible given it generally</td><td></td></tr>
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| | | applies to July + August?<br>What do we use if additional season begins on 1 October?<br>What do we use if there is no additional season? | |
| 11. | Maximum additional season increase in anchovy TAC | Maximum = 120 000t. Is this really feasible for Sep – Dec? The average Sep-Dec catch over 2001-10 has been 53 000t, with a max of 114 000 in 2001? What do we use if additional season begins on 1 October? | |
| 12. | Sardine TAB with anchovy during the additional season | Maximum = 2 000t. What do we use if additional season begins on 1 October? | |
| 13. | Greater initial anchovy TAC | Currently downweighted by p=0.7. Try p=0.8.<br>(What is the difference in average normal season TAC) | |
| 14. | Greater initial sardine TAB with anchovy | Currently this is $\gamma_y TAC_y^{1,A}$, where:<br>$\gamma_y = 0.1 + \frac{0.1}{1+\exp\left(-\frac{1}{0.1}0.00025\left(B_{y-1}^{obs,S} - 2000\right)\right)}$, i.e.<br>ranges from 0.1 to 0.2. Increase range to 0.3, or reduce to 0.15 given that TAB allocations recently seem to have been unnecessarily high? Note that while on the one hand there has been a request for more of the bycatch allocation upfront, on the other hand the fact that there can be no downward TAB adjustments in midseason argues to decrease the current initial allocation in circumstances where TAB allocations have seemed recently to be unnecessarily high. | |
| 15. | New anchovy TAB pool for sardine-only RHs | To be fixed = 250t or 500t | |
| 16. | New "small" sardine TAB pool for all RHs for sardine bycatch with fisheries other than anchovy | *The simulation of bycatch in the sardine directed fishery needs more work re how to allocate it and how to implement the TAB in catches when simulation testing* | |
| 17. | New "big" sardine TAB pool for all RHs (replaces (primarily) adult bycatch with redeye) | Will include an increase in the bycatch from the red eye fishery of ~3500t to 7000t<br>*The simulation of bycatch with anchovy still needs more work re how to allocate it and how to implement the TAB in catches when simulation testing* | |
| 18. | Modify Harvest Control Rule to accommodate the situation of no survey taking place | *MCM/2010/SWG-PEL/42 details the suggested method to test.* | |
| 19. | a) A move away from knife-edge exceptional circumstances thresholds eg the TAC begins to decrease a little below the minimum from eg 350 000t down to 250 000t below which it decreases rapidly. | *a) ECs are currently implemented at 300 000t for sardine and 400 000t for anchovy. A conservative measure is already in place below 800 000t for sardine which allows the TAC to be reduced by more than 20%. Note that if ECs are* | |

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| | b) Base exceptional circumstances thresholds on the survey estimate – 2SDs rather than on the actual estimate itself. This will account for the fact that the survey CV tends to increase as the survey estimate decreases<br><br>c) Concern as to the increasing exploitation rate as sardine biomass decreases | *implemented for sardine, only half the TAC is awarded at the start of the year, with the remainder being awarded in midyear following adjustment on the basis of the recruit survey estimate.*<br>*b) This is not straightforward as the equations for simulating this will need to be developed. A concern is that the CV estimate itself has a large CV and using it in the HCR could introduce unnecessary TAC variability. However, values of comparative performance statistics in trials will provide the basis for an objective test of whether or not such an approach achieves an improved catch vs resource risk trade-off.*<br>*c) This effect only occurs over a selected biomass range. It has been discussed frequently, including under international panel review, and accepted in principle as a defensible approach in the necessary trade-off evaluation of risk to the resource v risk to the industry. In response to earlier discussions, the additional B* threshold in the sardine HCR was introduced. What matters in contrasting alternative candidate MPs is not the form of the control rules but the acceptability of the trade-offs amongst performance statistics.* | |
| 20. | Adopting a more conservative management approach for sardine following successive poor sardine recruitments – this has been previously raised by Larry, and is something I agree with and think we should consider. Conceptually, this would be something along the lines of reducing the directed sardine control parameter (beta) by increments (5% per annum as a starting point?) following successive poor sardine recruitment. Poor recruitment is obviously something that would have to be carefully defined, and perhaps tests using different thresholds for poor recruitment (e.g. below the long-term average, below 1 standard deviation below the long-term average, etc) could be conducted. Such an approach would only be applied after 2 (or more) successive years of poor recruitment, possibly along the following scheme:<br><br>a. 2 successive years of poor recruitment results in beta being reduced by 5%<br>b. 3 successive years of poor recruitment results in beta being reduced by 10%<br>c. 4 successive years of poor recruitment results in beta being reduced by 15%<br>d. etc. | *We wouldn't suggest changing* $\beta$ *but we could look at taking a proportion (<1) of the directed sardine TAC which the HCR calculates.*<br>*This is not straightforward as the rules to determine "poor" recruitment will need to be simulated.*<br>*Discontinuous changes are undesirable because large changes in the TAC can result from very small changes in data – this suggestion needs to be recast in a continuous form. The reverse change also needs to be specified as well – how the control changes upwards when the poor recruitment period ends.* | Specific proposal required |

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| 21. | a) Spatially disproportionate fishing<br><br>b) Spatial (west v east) management of the directed sardine TAC (from a practical point of view, we cannot evaluate such splits for all components of the pelagic fishery simultaneously and this is considered the most important place to start) | *a) This issue can be addressed given the inclusion of a multi-stock sardine population model amongst the OMs.<br>Further, if there is evidence in the commercial catch-at-length distributions for appreciable differences east and west of Cape Agulhas, then there would be a case for addressing this spatial issue by treating the harvesting in the assessment model as by two separate "fleets", with different selectivities-at-age, on the two sides of Cape Agulhas. This would require an alternative fit of the single stock sardine population model. The PWG considers this option of low priority relative to consideration of a two-stock OM for sardine.<br>Note that such evaluations will also require the specification of the rules to allocate catches east and west of Cape Agulhas, presumably based on future resource monitoring information from surveys.<br>b) This requires the candidate MP to be tested against the two stock OM. Assumptions as to how future fishing will be split west/east must be discussed.* | |
| 22. | Health of seabirds and other top predators | This will be tested using the penguins from Robben island as an indicator of all seabirds (primarily due to data availability). However any possible modifications to management of the pelagic fishery will await OMP-13 finalisation at the end of 2012. | |
| 23. | Explicit documentation of objectives against which candidate MPs are evaluated and the specific criteria that speak to these objectives and the "measurements" that are being used. | The performance statistics used in the evaluation of OMP-08 are already well documented (de Moor and Butterworth, 2008). Additional performance statistics can be added if provided in mathematical detail. | |
| 24. | The Pelagic SWG needs to discuss the hierarchy in which these objectives are to be arranged, which e.g. would result in weights for combination of the various measures into an overall evaluation.<br>Moloney & Johnston (2002, SAJS) illustrate how this can be done. | *The approach of maximising some utility function, e.g. through some weighted average over performance statistics has been discussed frequently in international as well as local fora, and generally rejected in favour of inspection of trade-offs for various statistics separately under different candidate OMPs. However, given a suggestion for such a utility function, it can readily be added to the list of performance statistics generated in simulations - again though this function needs to be spelt out in mathematical detail. There is already a hierarchy accepted in this process, which is first to ensure required resource risk thresholds for both sardine and anchovy are met, and then to consider trade-offs amongst other performance statistics subject to* | Specific proposal required |

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| | | *still meeting those thresholds.* | |
| 25. | With respect to penguins and gannets - a minimum total biomass in the larger area for foraging year-round (e.g., results of Will's model), | A minimum total biomass year round is outside the scope of the OMs which are formulated in terms of numbers and hence biomasses at discrete intervals rather than continuously, also given data availability. Robinson's model will directly contrast the extent of fishing against impact on penguin population trends, with effects appropriately integrated over time to give net effect on penguin trends which is the measure of conservation concern. | Models are not structured in a form that could address this |