

## Alternative OMP trade-off curves in response to the request by SAPFIA

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In preparation for OMP-12, SAPFIA requested trade-off curves to be plotted for three cases where changes to the TAC rules and/or constraints of OMP-08 are considered and asked for a trade-off curve to show the effect of alternative choices of the control parameter  $\beta$  which specifies the proportion of the sardine biomass estimate from the November survey that is recommended as the TAC (subject to other constraints). [The SPFIA requests are reproduced in the Appendix.]

### Results and Discussion

The OMP-08 trade-off curve is plotted in Figure 1 for the range of  $\beta=0$  with  $\alpha_{ns}=0.78$  to  $\beta=0.132$  with  $\alpha_{ns}=0$ . The “limits” of the curve are determined by points at which  $\beta=0$  and  $\alpha_{ns}=0$ , and are dependent on the allocated TACs in the year prior to simulation and the constraints in the OMP, such as the maximum inter-annual decrease in TACs and the minimum TACs. Thus these limits will likely be different for OMP-12, given updated assessments and the TACs for 2011.

Figure 2 shows the trade-off curve for OMP-08 together with trade-off curves for SAPFIA’s requests 2-4. The exclusion of the two-tier system results in the right-hand side of the trade-off curve increasing in terms of the maximum average anchovy catch. This appears counter-intuitive to the reason for originally including the two-tier system. The benefit of the two-tier system, when introduced for OMP-04, allowed for higher catches on average for the same level of risk. The reason for the increase in the maximum projected average anchovy catch is due to the fact that the anchovy abundance at the beginning of the OMP-08 projection period was already high, with TACs frequently projected above the two-tier threshold. The two-tier threshold allows for a larger decrease in TAC from one year to the next in this “high” bracket than the maximum 25% decrease which applies below the two-tier threshold and in this scenario where the two-tier system is removed. Thus one should be careful not to over-interpret these results.

There is little change to the trade-off curve when the minimum anchovy TAC is decreased from 120 000t to 100 000t. This may be due to the healthy state of the anchovy population at the beginning of the projected period and therefore the lower chance of this constraint being applied. A different result might follow if the initial anchovy abundance was lower.

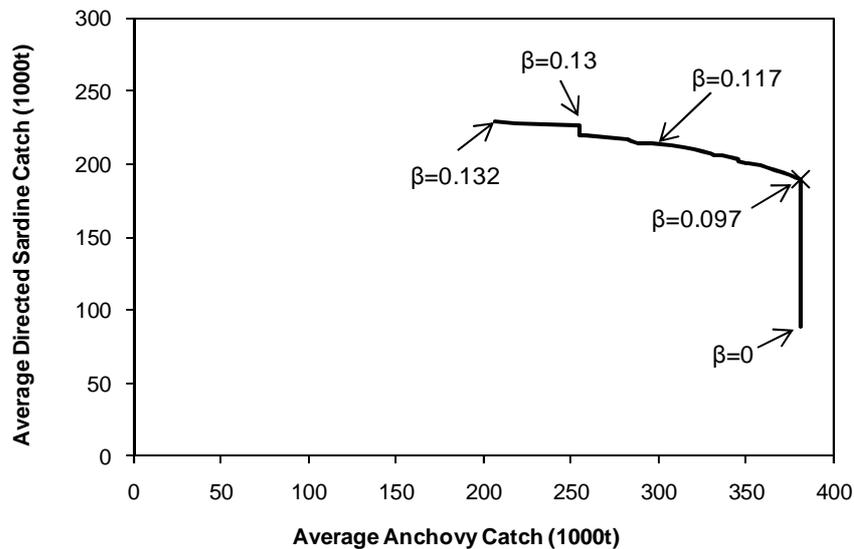
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A decrease in the maximum anchovy TAC from 600 000t to 470 000t<sup>1</sup> results in a movement of the right-hand side of the trade-off curve from a maximum average anchovy catch of about 380 000t to 376 000t. If the maximum anchovy TAC constraint were instead decreased to 350 000t, the maximum projected average anchovy catch would decrease further to about 340 000t.

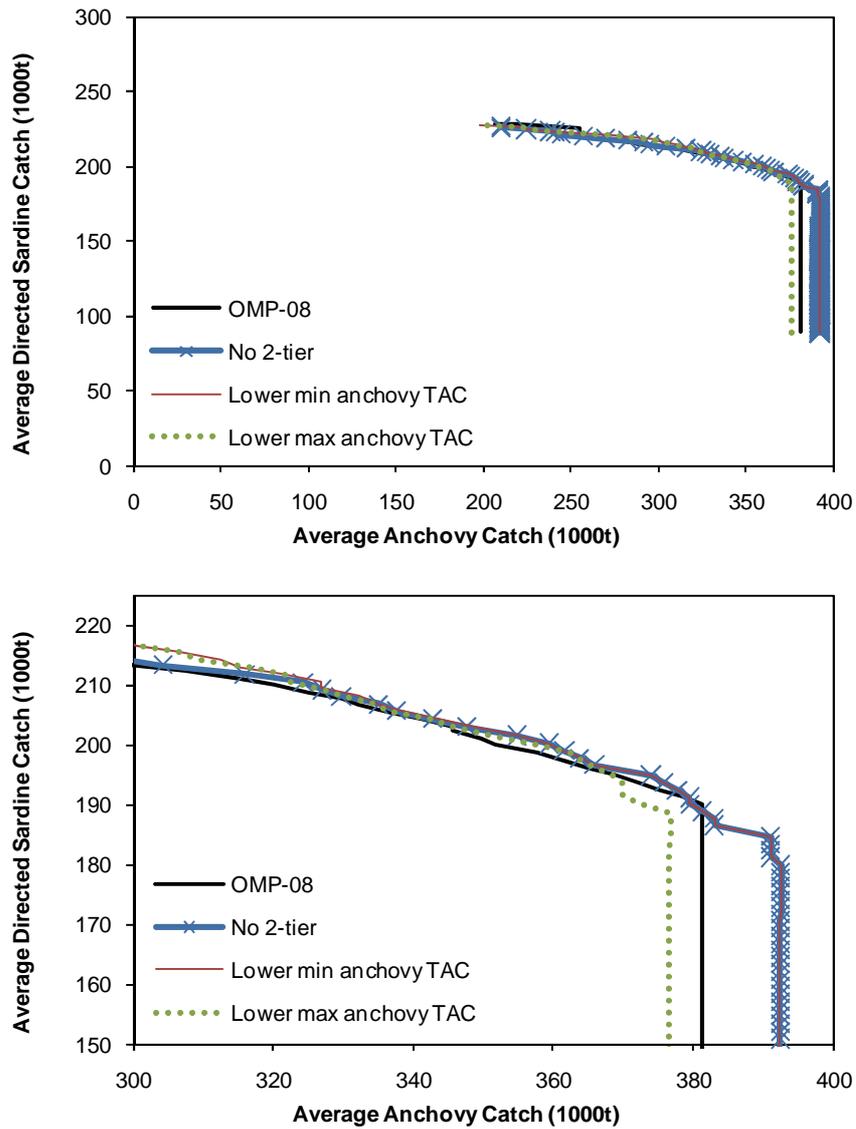
The control parameters and associated average directed sardine, average sardine bycatch and average anchovy catch for each point on these curves are given in the associated file *OMP Comparisons for SAPFIA.xlsx* which is freely available.

It is important to bear in mind that these results are dependent on the projected status of the sardine and anchovy resources, which will change with the updated assessments.



**Figure 1.** Trade-off curves for OMP-08, determined by points satisfying  $risk_S < 0.18$  and  $risk_A < 0.10$ . The cross on the curve represents the chosen OMP-08 trade-off point.

<sup>1</sup> Calculated from 350 000t for the normal season and 120 000t for the additional season.



**Figure 2.** Trade-off curves satisfying  $risk_S < 0.18$  and  $risk_A < 0.10$  for i) OMP-08, ii) OMP-08 without the two-tier system for sardine and anchovy, iii) ii) with the anchovy minimum TAC decreased from 120 000t to 100 000t, and iv) iii) with the anchovy maximum TAC decreased from 600 000t to 470 000t. The lower plot is a reproduction of the upper plot, on a smaller scale.

**Appendix 1: Request by SAPFIA to consider several scenario's to explore regarding modifying OMP-08 in preparation for OMP-12 (MCM/2010/SWG-PEL/20)**

SAPFIA would like to see the following scenario's explored, because we believe that this step-wise approach should give a better understanding of the relative effect of various constraints and control parameters, thus allowing the industry and the PWG to make informed decisions about preferred scenario's for OMP-12:

1. Keep all the risks and constraints in OMP08 constant, except to vary  $\beta$ , the directed sardine control parameter according to the following table:

Control Parameter		OMP-99	OMP-02	Re-Revised OMP-04	OMP-08
$\beta$	directed sardine control parameter	0.1375	0.1865	0.14657	0.097

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  $\alpha_{ns}$ ).

2. The same scenario's as for 1 above, but giving up the two-tier system for both anchovy and sardine.
3. The same scenario as for 2 above, but also decreasing the anchovy minimum TAC to 100 000 t.
4. The same scenario as for 3 above, but now also decreasing the maximum anchovy normal season TAC to 350 000 t.