

Proposed Change of Risk Criteria for Sardine and Anchovy

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As with previous OMP revisions, we are faced with the need to consider redefinition of the risk criteria. This is because the more or less the abundance of an unexploited resource fluctuates naturally, the more or less resilient it is to reduction to a specified level through exploitation, and hence the greater or lesser the acceptable probability that fishing reduce the resource to below that level (the basis we use for a risk criterion).

The differences from the OMP-04 situation have arisen because the updated assessments have produced revised estimates of the extent of recruitment fluctuation and of natural mortality, both of which impact the extent to which biomass fluctuates from year to year with or without fishing.

Changes in the information below from what have previously been circulated to the PWG are that the sardine assessment posterior distributions were finalised and that serial correlation from the already observed May 2007 (November 2006) recruitment to May 2008 (November 2007) is included.

To attempt to redefine this level of risk in as objective a manner as possible we considered the following. The primary criterion used has been a multiplicative adjustment of the probability threshold defining risk level for a biomass threshold defined as for OMP-04, by comparing ratios of probabilities in the absence of fishing to the OMP-04 case. This suggests (in round figures) a risk probability of 20% for sardine for the new OMP (Table 2), and 25% for anchovy (Table 4).

The secondary criterion, as suggested at the last PWG meeting was to compare the extent to which the biomass distribution curve is moved to the left under OMP-regulated fishing compared to the no-fishing situation. Here Figure 1 provides results for sardine for the new (currently termed "straw2") OMP. Results have been calculated for thresholds (risk levels) of 15, 18 and 20%. It is our judgement that the 18% case gives the closest correspondence in terms of leftward shift to the OMP-04 situation shown in the top panel as well as the closest correspondence to the curve circulated to the PWG a week ago (Figure 2).

Hence our proposal is to proceed at this stage with probability thresholds (risk levels) for sardine and anchovy of 18% and 25% respectively.

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Table 1. The probability that sardine biomass drops below B_{04}^* at least once during the projection period of 20 years, using the OMP-04 simulation framework with the associated 2004 assessment (this defines “Risk” for OMP-04). B_{04}^* is the average 1991 to 1994 sardine November biomass calculated using the 2004 sardine assessment.

	B_{04}^*	$1.25 \times B_{04}^*$
C=0	0.01	0.03
C=OMP-04	0.098	0.188

Table 2. The probability that sardine biomass drops below B_{07}^* at least once during the projection period of 20 years, using the OMP-08 simulation framework with the associated updated assessment. B_{07}^* is the average 1991 to 1994 sardine November biomass calculated using the 2007 sardine assessment.

	B_{07}^*	$1.25 \times B_{07}^*$
C=0	0.022	0.108
$(C=OMP-04)^{04}/(C=0)^{04} \times (C=0)^{08}$	0.216	0.677
$(C=OMP-04)^{04} - (C=0)^{04} + (C=0)^{08}$	0.110	0.266

Table 3. The probability that anchovy biomass drops below $0.1 \times B_{04}^*$ at least once during the projection period of 20 years, using the OMP-04 simulation framework with the associated 2004 assessment (this defines “Risk” for anchovy for OMP-04). B_{04}^* is the average 1984 to 1999 anchovy November biomass calculated using the 2004 anchovy assessment.

	$0.1 \times B_{04}^*$	$0.15 \times B_{04}^*$
C=0	0.028	0.042
C=OMP-04	0.28	0.376

Table 4. The probability that anchovy biomass drops below $0.1 \times B_{07}^*$ at least once during the projection period of 20 years, using the OMP-08 simulation framework with the associated updated assessment. B_{07}^* is the average 1984 to 1999 anchovy November biomass calculated using the 2007 anchovy assessment.

	$0.1 \times B_{07}^*$	$0.15 \times B_{07}^*$
C=0	0.024	0.060
$(C=OMP-04)^{04}/(C=0)^{04} \times (C=0)^{08}$	0.240	0.537
$(C=OMP-04)^{04} - (C=0)^{04} + (C=0)^{08}$	0.276	0.394

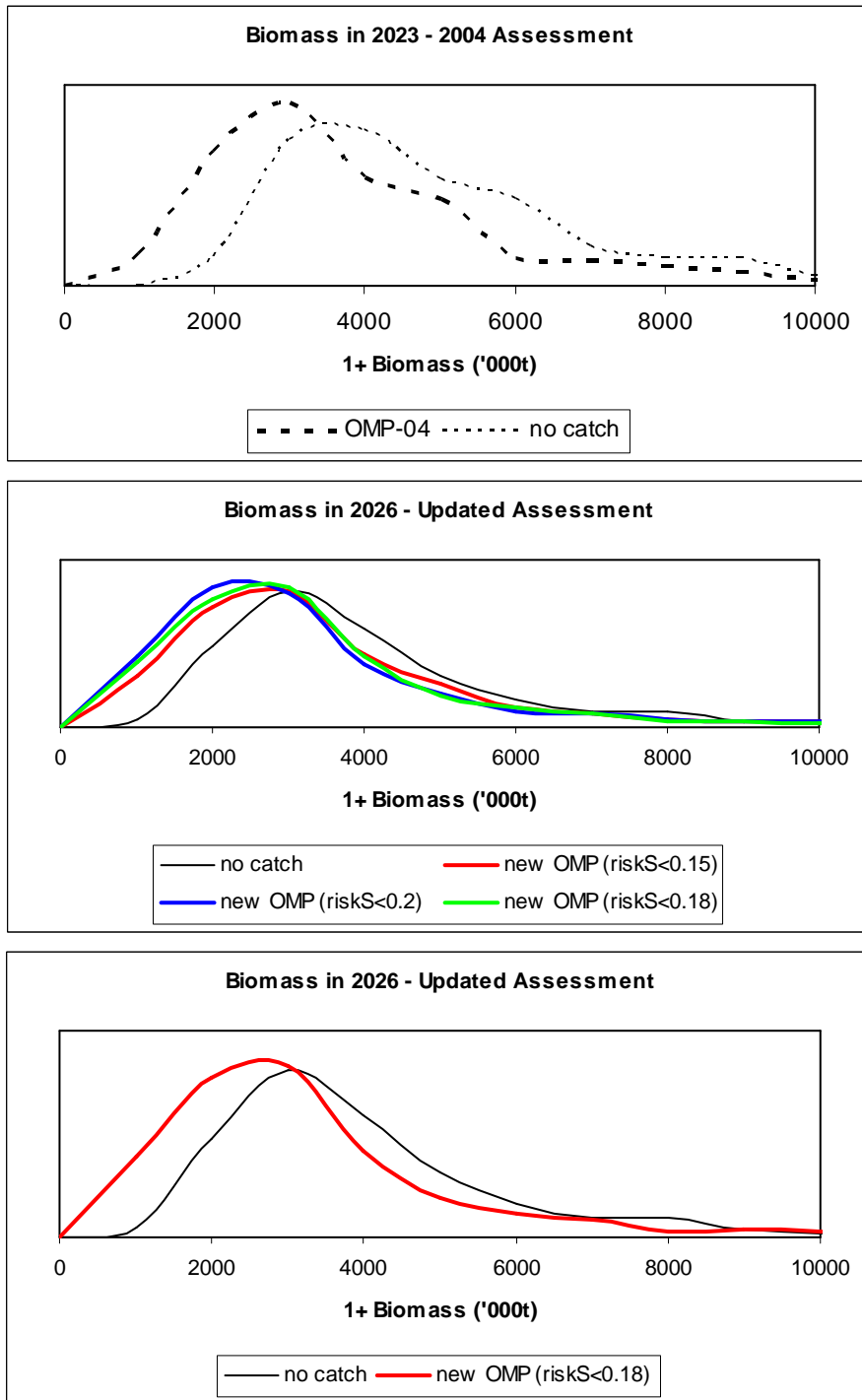


Figure 1: Comparison of sardine biomass distributions in the final projection year under a no catch scenario and the pertinent OMP for the 2004 assessment (upper panel) and the updated assessment (middle panel). The lower panel is a repeat of the middle panel, showing only proposed risk level of 0.18 for sardine (with riskA<0.25).

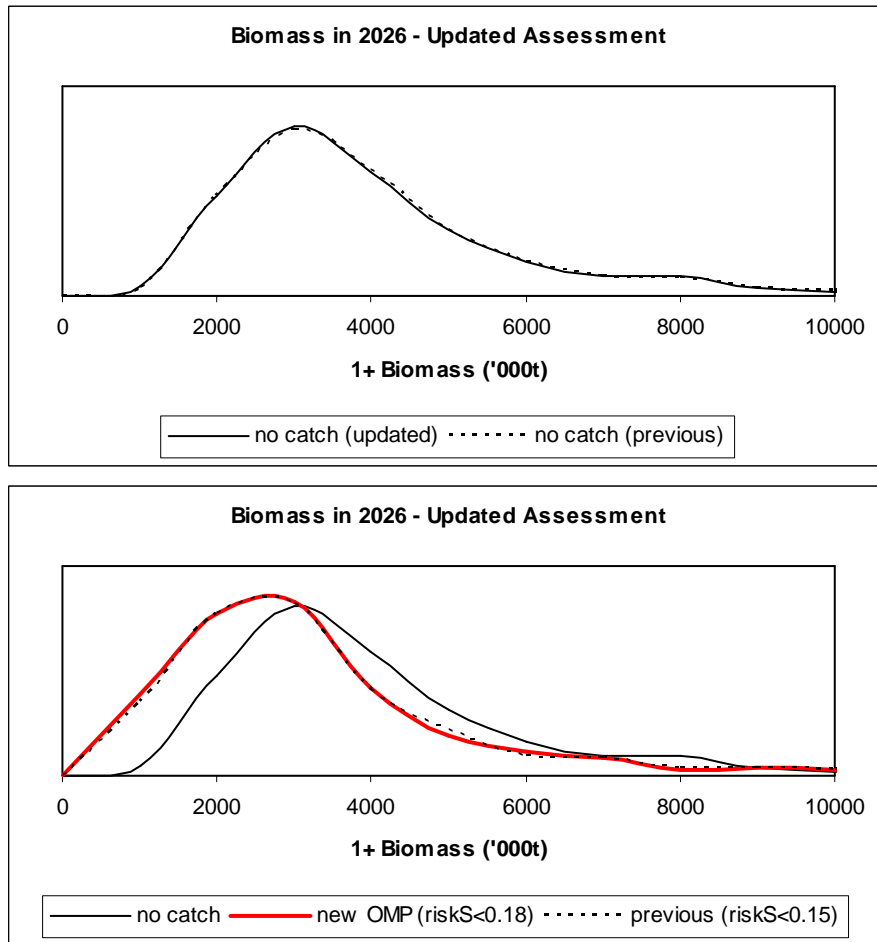


Figure 2: Comparison of sardine biomass distributions in the final projection year under a no catch scenario for the updated operating model compared to that circulated a week ago (upper panel) and the pertinent OMP for the updated assessment (lower panel), indicating little difference between the new choice of riskS<0.18 with the previously circulated choice of riskS<0.15.

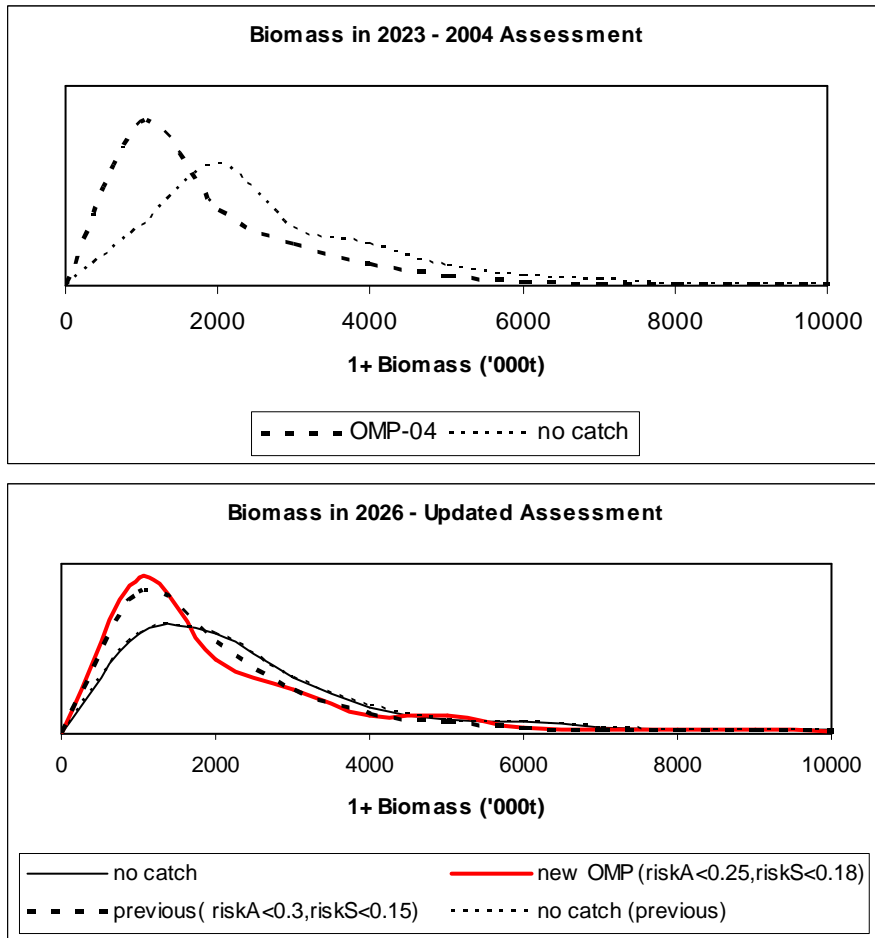


Figure 3: Comparison of anchovy biomass distributions in the final projection year under a no catch scenario and the pertinent OMP for the 2004 assessment (upper panel) and the updated assessment (lower panel). In the lower panel riskA<0.25, while riskA was < 0.3 for OMP-04 in the circular a week ago.