MODIFICATION TO TAC RULE FOR DIRECTED MIDWATER CATCHES OF HORSE MACKEREL TO INCORPORATE A REVISED CPUE SERIES

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The following form of catch control rule has been agreed for providing advice on future midwater TACs for horse mackerel:

$$TAC_{y+1} = \Delta_y \, TAC_y$$

$$\Delta_y = \begin{cases} 1 - X_{decr} & \text{for} \quad I_y < I_{decr} \\ 1 - X_{decr} + \dfrac{X_{incr} + X_{decr}}{I_{incr} - I_{decr}} \left(I_y - I_{decr} \right) & \text{for} \quad I_{decr} \leq I_y < I_{incr} \\ 1 + X_{incr} & \text{for} \quad I_y \geq I_{incr} \end{cases}$$

I_y is usually related to a weighted average of the last three years of survey and CPUE data, but since recent surveys have not been conducted by *Africana*, it is calculated for next year using only CPUE data, as agreed at an earlier DWG meeting this year.

A recently discovered error in the catch-effort database for horse mackerel necessitated restandardisation of the CPUE series (Singh *et al.* 2014), and consequent re-evaluation of the parameter values for the catch control law to achieve the same risk target as agreed previously. The revised values of these parameters are given in Table 1, with the change illustrated graphically in Figure 1.

Table 2 gives the recent standardized CPUE values from Singh (DAFF, *pers. commn*), from which it follows that:

$$\begin{aligned} I_{2014} &= \frac{1/3 \sum_{2011}^{2013} CPUE_y}{1/7 \sum_{2003}^{2009} CPUE_y} \\ &= \frac{0.96}{0.90} \\ &= 1.07. \end{aligned}$$

Since 1.07 > I_{incr} = 1.01, this corresponds to a 10% increase over last year's TAC, resulting in a recommended **midwater TAC for 2015 of 41 927 tonnes compared to last year's TAC of 38 115 tonnes**.

Table 1: Comparison between parameter values and performance statistic for the old midwater MP (separately using the old and revised CPUE series) and the revised midwater MP (using the revised CPUE series).

	Old MP, old CPUE	Old MP, revised CPUE	New MP, revised CPUE
I_{decr}	0.72	0.72	0.84
I_{incr}	1.16	1.16	1.01
Risk of depletion	5.57% (0.15)	6.45% (0.15)	5.57% (0.14)
Catch range	137 (1.17)	2727 (0.07)	4048 (0.06)
Average Annual Variation (in TAC)	7.61% (0.01)	6.58% (0.01)	9.22% (0.00)
Mean annual catch	46545 (0.01)	39537 (0.01)	43416 (0.01)
Median Bsp(2023)/K	47.62% (0.02)	50.25% (0.01)	47.51% (0.02)

Table 2: Recent standardized CPUE series from Singh (DAFF, pers. commn).

Year	CPUE
2003	0.80
2004	0.69
2005	0.82
2006	1.00
2007	1.25
2008	0.91
2009	0.86
2010	1.13
2011	1.42
2012	0.68
2013	0.79

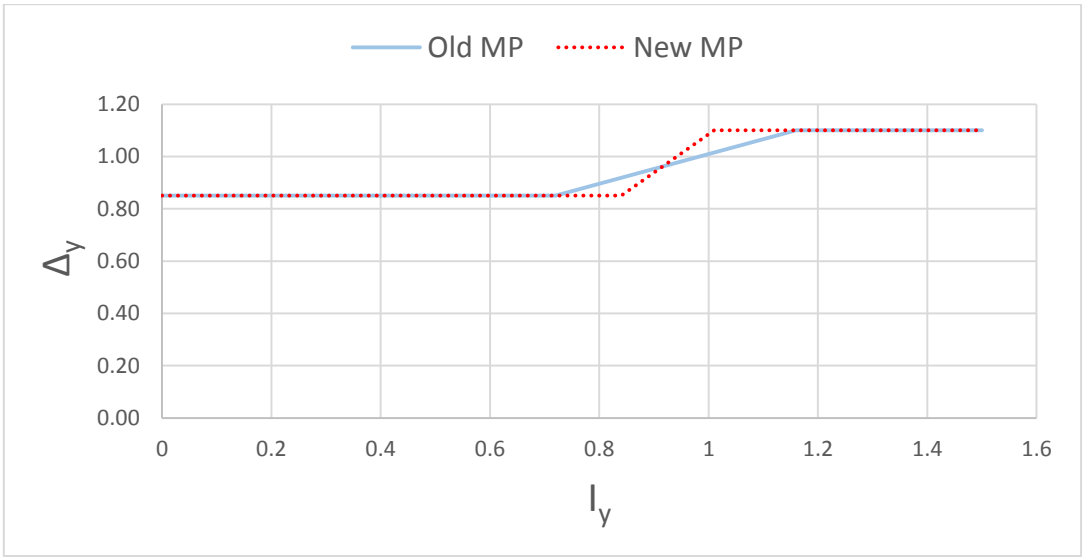

Figure 1: Comparison between the old midwater MP and the revised midwater MP.

References

Singh, L., Glazer, J. and Fairweather, T. 2014. Updated horse mackerel CPUE trend. Unpublished report, DAFF, South Africa. FISHERIES/2014/SEPT/SWG-DEM/53. 7pp.