

Output from the South African Hake OMP-2010 for the 2014 TAC recommendation

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Abstract

The TAC output from the South African hake OMP-2010 for 2014 is **155 280 t**, a 0.6% decrease on the 2013 TAC.

The 2014 TAC recommendation for the South African hake resource is computed in terms of the 2010 OMP (Rademeyer *et al.*, 2010) as follows:

$$C_y^{spp} = w_y C_{y-1}^{*spp} \left[1 + \lambda_{up/down} (s_y^{spp} - T_y^{spp}) \right] + (1 - w_y) \left[a^{spp} + b^{spp} (J_y^{spp} - 1) - Pen_y^{spp} \right] \quad (1)$$

The computations input a TAC of 156 075 thousand tons for 2013. As specified in the OMP, this is disaggregated by species assuming the 2012 species-split of the catches, i.e. 79.94% (124 761 t) *M. paradoxus* and 20.06% (31 314 t) *M. capensis* to provide the C_{y-1}^{*spp} values for input to equation (1).

The GLM-standardised CPUE series (Glazer, 2013) and survey biomass abundance estimates (Fairweather *et al.*, 2013) used as inputs to the OMP are shown in Table 1 and the resulting trends in Fig. 1. The 2013 West Coast survey biomass estimates are abundance estimates from the *Nansen* calibrated to an *Africana* Old Gear equivalent (see Fairweather *et al.*, 2013); the best estimates are given in Table 1. The 95% probability intervals are (219 480t - 377 240t) for *M. paradoxus* and (33 270t - 75 210t) for *M. capensis*. Since the 2012 and 2013 South Coast autumn surveys have not taken place, the trend for each species for that survey is computed using only four years data (2008-2011) instead of six, as is the procedure in the event of missing data described in the OMP specifications (Rademeyer *et al.*, 2010). The updated series fall within the 95% PI's projected for the Reference Set under OMP-2010 (Fig. 2). Note that the results from surveys carried out with the *Africana* with new gear have been rescaled to take the calibration factor into account (this involves dividing new gear estimates by 0.95 for *M. paradoxus* and 0.80 for *M. capensis*), as specified in the OMP (Rademeyer *et al.*, 2010)); the 'true' estimates are shown in parenthesis in Table 1.

The recent annual trend, s_y , computed from a specified weighted average of the CPUE and survey slopes is 2.026% for *M. paradoxus* and 8.665% for *M. capensis*. The measure of immediate past level in the abundance indices, J_y , is 0.67 for *M. paradoxus* and 1.04 for *M. capensis*.

The following parameters are also year dependent:

$$w_{2014} = 5/6, T_{2013}^{para} = 0.75\% \text{ and } T_{2013}^{cap} = 0\% .$$

Since J_y for *M. paradoxus* is less than p^{spp} (0.75):

$$Pen_y^{spp} = 180(0.670 - 0.75)^2 = 1.15$$

Thus the *M. paradoxus* contribution to the TAC is:

$$C_{2013}^{para} = \frac{5}{6} 124761t [1 + 1.25(2.03\% - 0.75\%)] + \left(1 - \frac{5}{6}\right) [104.5 + 60(0.67 - 1) - 1.15] = 119549t$$

and the *M. capensis* contribution:

$$C_{2013}^{cap} = \frac{5}{6} 31314t [1 + 1.25(8.665\% - 0\%)] + \left(1 - \frac{5}{6}\right) [40 + 20(1.04 - 1)] = 35730t$$

The total 2014 TAC output from the OMP is therefore **155 280 t**. This represents a decrease of 0.6% from the 2013 TAC of 156 075 t, and so is not impacted by the OMP constraint that TACs not change by more than 10% per year.

References

- Fairweather T, Rademeyer RA and Butterworth DS. 2013. Abundance estimates for Hake - Nansen vs Africana. Unpublished report, FISHERIES/2013/SEPT/SWG-DEM/54
- Glazer JP. 2013. Offshore hake species- and coast-specific standardized CPUE indices. Unpublished report: FISHERIES/2013/AUG/SWG-DEM/26.
- Rademeyer RA, Fairweather T, Glazer JP, Leslie RL and Butterworth DS. 2010. The 2010 Operational Management Procedure for the South African *Merluccius paradoxus* and *M. capensis* Resources. Unpublished report: FISHERIES/2010/OCTOBER/DEM59.

Table 1: GLM standardised CPUE series and West coast summer and south coast autumn survey abundance estimates used as input in the 2013 TAC computations. Note that the abundance estimates in bold incorporate the calibration factors agreed for OMP application as they are for surveys in which the new gear was used on the *Africana*. The values in parentheses are the actual estimates obtained from the surveys. The West coast 2013 survey results are from application of a calibration factor to the *Nansen* results.

	<i>M. paradoxus</i>				<i>M. capensis</i>			
	WC CPUE	SC CPUE	WC summer survey	SC autumn survey	WC CPUE	SC CPUE	WC summer survey	SC autumn survey
2006	2.395	1.417	315.31	34.80	0.559	1.180	88.42	130.90
2007	2.872	1.490	417.95 (397.05)	136.47 (129.65)	0.603	1.034	102.55 (82.04)	88.68 (70.94)
2008	3.509	1.435	259.52 (246.54)	41.58 (39.51)	0.507	1.597	63.60 (50.88)	135.24 (108.20)
2009	3.585	1.662	347.62 (330.23)	108.25 (102.83)	1.017	2.909	219.11 (175.29)	155.01 (124.00)
2010	3.704	1.938	589.53	169.56	1.042	2.369	163.54	184.96
2011	3.534	2.185	365.35 (347.08)	25.37 (24.11)	1.262	3.443	111.74 (89.39)	146.53 117.22
2012	3.117	1.847	377.52 (330.23)	-	1.037	2.037	115.74 (92.59)	-
2013			287.74	-			50.03	-

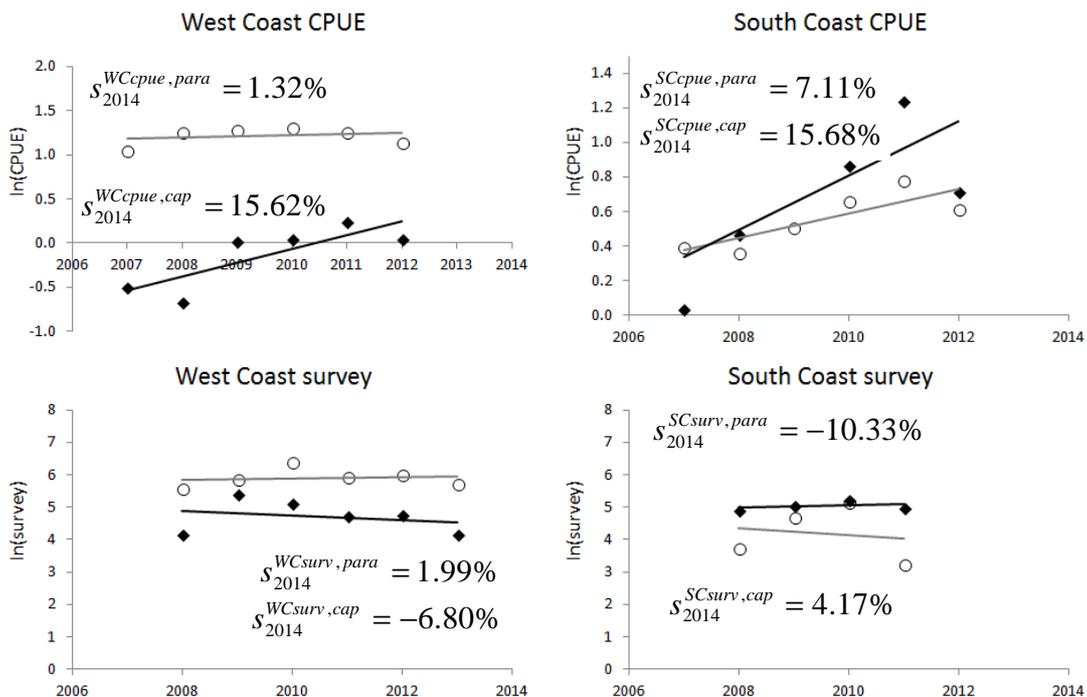


Fig. 1: Recent trends in the GLM-standardised CPUE and survey abundance indices for *M. paradoxus* (open circles) and *M. capensis* (black diamonds) which are used in the TAC computation. The survey abundance estimates shown incorporates the calibration factors specified in the OMP for the years in which the new gear was used on the *Africana*.

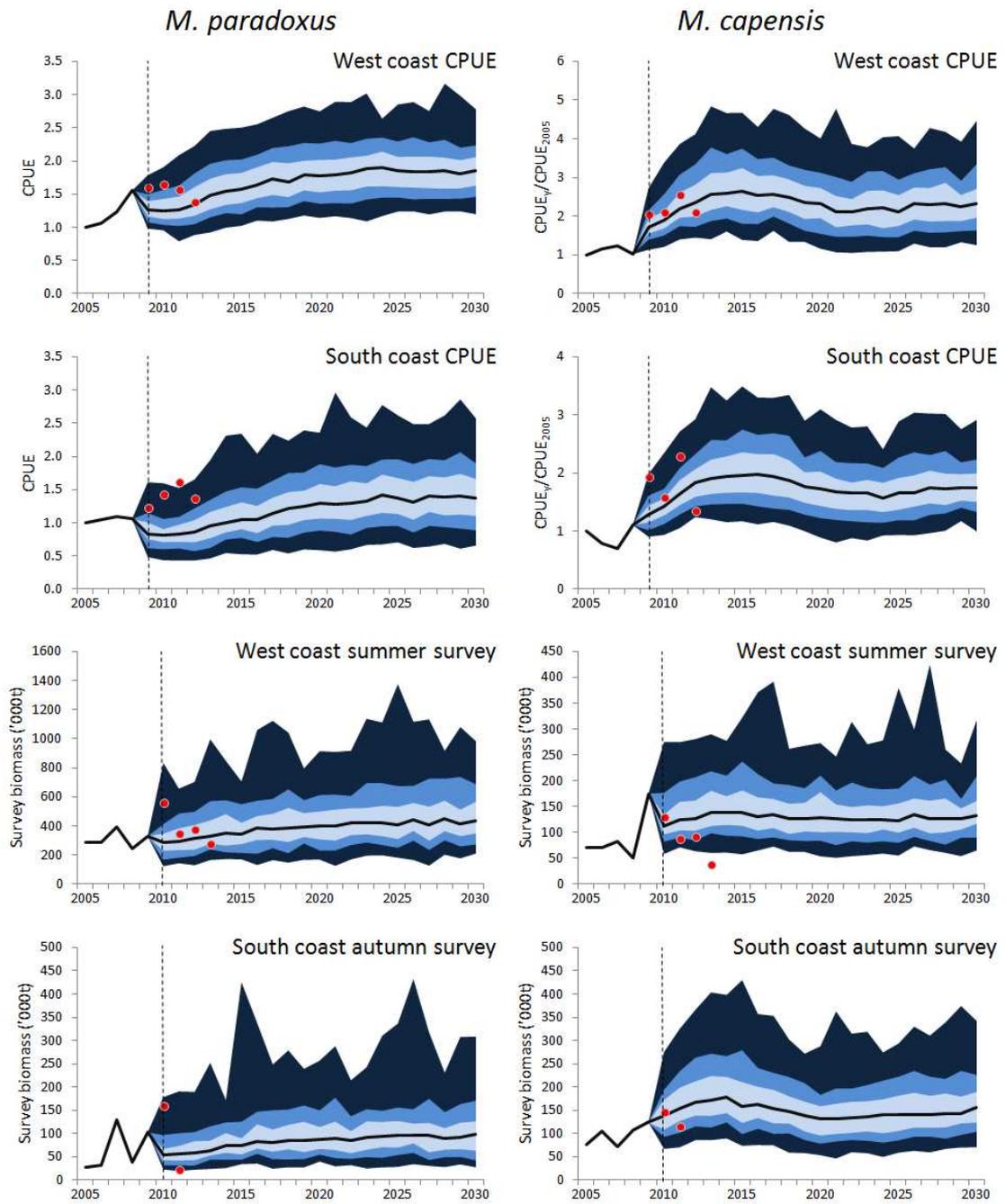


Fig. 2: Projections (95%, 75%, 50% PI and medians) for the Reference Set under OMP-2010 compared with the most recent resource abundance index data. The red dots show the new data points.