Application of a minor variant of OMP-2014 to the updated base case operating model for the SCRL resource

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ABSTRACT

Projected TAC outputs for OMP-2014 at that time are compared to those that subsequently eventuated. A minor variant of OMP-2014 is applied to the adjusted base case SCRL operating model for a number of values for the central parameter CPUE_targ.

Previously OMP-2014 and projections from 2014 were based on the base case OM available at that time. These are shown in Figures 1 and 2 together with values of subsequent TACs and the current estimate of B/K. Table 1 gives results for the value of control parameter CPUE_targ selected at the time (1.22) of the previous OMP-2014 selection.

At this stage the only changes made to OMP-2014 to provide candidate CMP-2019 are the values of the CPUE weighting factors (λ_{A1E},λ_{A1W} and λ_{A2+3}) which weight the CPUEs by area. The candidate CMP-2019 considered here is detailed in the Appendix. Figures 2 and 3 show projections under this CMP-2019 based on the current updated base case OM (Johnston and Butterworth 2019) and a value of the control parameter CPUE_targ that was used for OMP-2014. Table 2 provides similar results to Table 1, updated both to CMP-2019 and for various values of CPUE_targ for the current updated OM.

Reference

Johnston, S.J. and Butterworth, D.S. 2019. 2018 updated South Coast rock lobster assessment results. FISHERIES/2019/APR/SWG-SCRL/02.

Table 1: **OMP-2014** results presented for three tunings (The TAC was increased 5% in first season, thereafter OMP rules set TAC). Values reported are medians, with the 5th and 95th percentiles shown in parentheses for some statistics. The row bolded is for OMP-2014 as finally selected.

$\mathbf{CPUE}_{targ}$	$\mathbf{CPUE}_{targ}$ in industry units(tails kg per day)	CPUE threshold (tails kg per day)	Bsp(2025/06)	Bsp(2025/K)	Cave (2014-2025)	Cave (2019-2025)	Cave (2019-2028)	A1E B^{exp}(2025)/K Lower 5thile	A1W B^{exp}(2025)/K Lower 5thile	A2+3 B^{exp}(2025)/K Lower 5thile
0.95	246	180	1.22 (0.65; 2.75)	0.39 (0.21; 0.89)	427 (381; 428)			0.13	0.20	0.19
1.22	**316**	**180**	**1.30 (0.75; 2.79)**	**0.41 (0.24; 0.91)**	**409 (300; 427)**	**443 (272; 450)**	**445 (264; 450)**	**0.16**	**0.25**	**0.22**
1.35	350	180	1.40 (0.86; 2.89)	0.45 (0.27; 0.93)	373 (275; 426)			0.17	0.29	0.25

Table 2: **CMP-2019** results presented for different tunings (values of CPUE_targs). Values reported are medians, with the 5th and 95th percentiles shown in parentheses for some statistics.

$\mathbf{CPUE}_{targ}$	$\mathbf{CPUE}_{targ}$ in industry units(tails kg per day)	CPUE threshold (tails kg per day)	Bsp(2025/06)	Bsp(2025/K)	Cave (2014-2025)	Cave (2019-2025)	Cave (2019-2028)	A1E B^{exp}(2025)/K Lower 5thile	A1W B^{exp}(2025)/K Lower 5thile	A2+3 B^{exp}(2025)/K Lower 5thile
0.80	207	180	1.24 (0.70; 2.24)	0.36 (0.20; 0.65)	418 (391; 426)	-	-	0.14	0.05	0.25
0.95	246	180	1.27 (0.72; 2.29)	0.36 (0.21; 0.66)	414 (385; 425)	381 (354; 392)	402 (381; 409)	0.14	0.06	0.27
1.22	**316**	**180**	**1.32 (0.78; 2.32)**	**0.38 (0.22; 0.67)**	**402 (374; 409)**	**355 (355; 355)**	**381 (374; 409)**	**0.16**	**0.07**	**0.29**
1.35	350	180	1.33 (0.80; 2.34)	0.38 (0.23; 0.67)	401 (370; 409)	355 (325; 355)	381 (350; 381)	0.16	0.07	0.30

Figure 1: The median, 5th and 95th percentile predicted TACs for **OMP-2014under the base case OM agreed in 2014**. The open squares show the five TACs that have resulted following the use of this OMP-2014 for setting the SCRL annual TACs for 2014-2018.

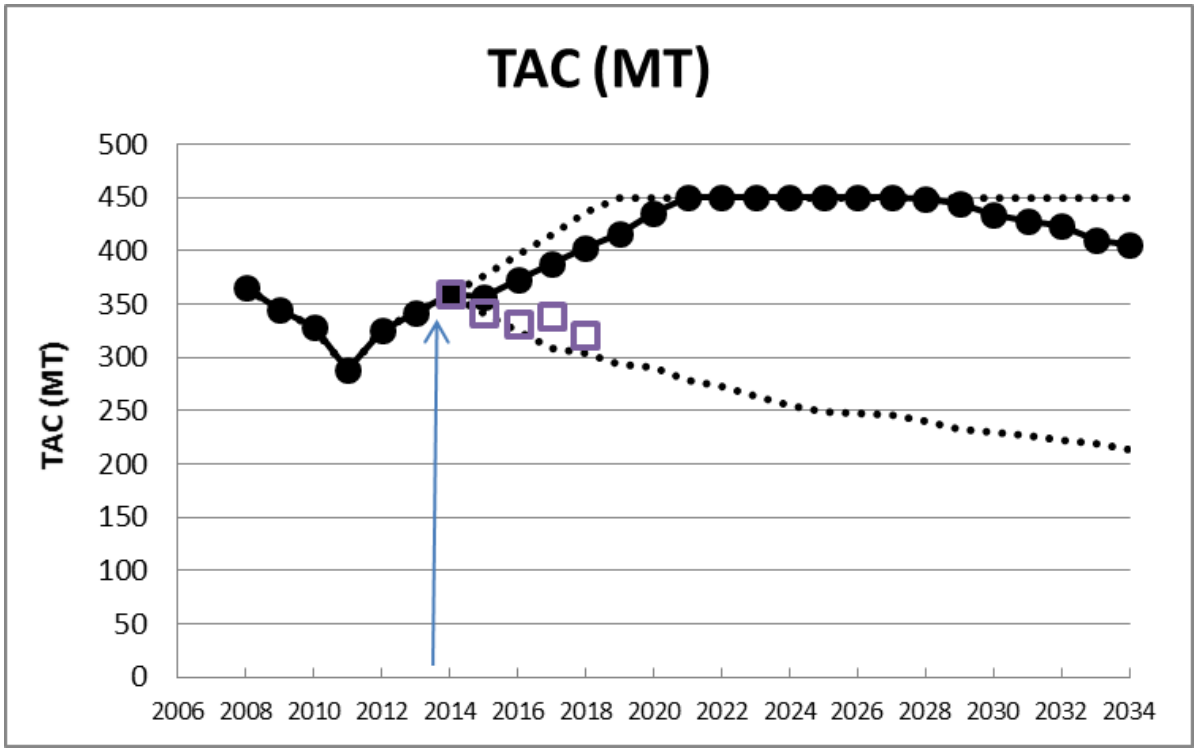


Figure 2: CMP-**2019** (CPUE_targ=1.22) TAC trajectories. The median and 5th and 95th percentiles are shown (the latter coincide with the medians).

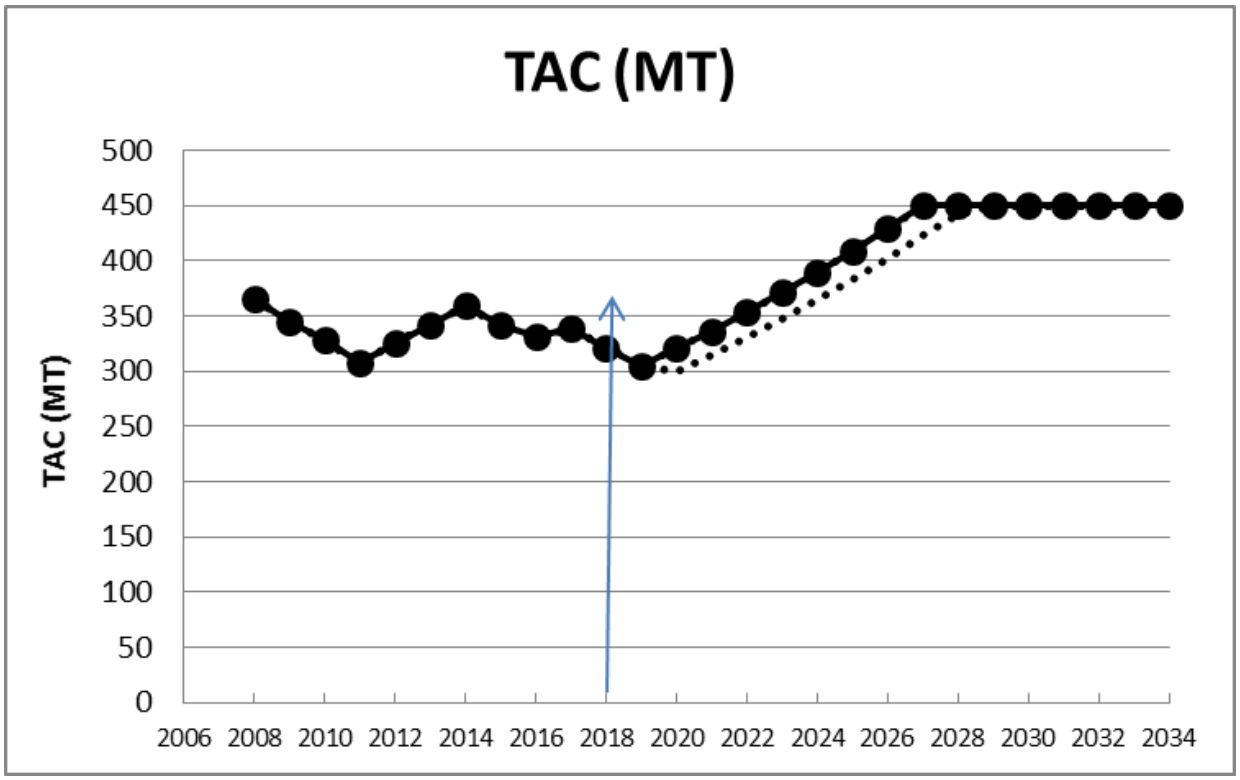
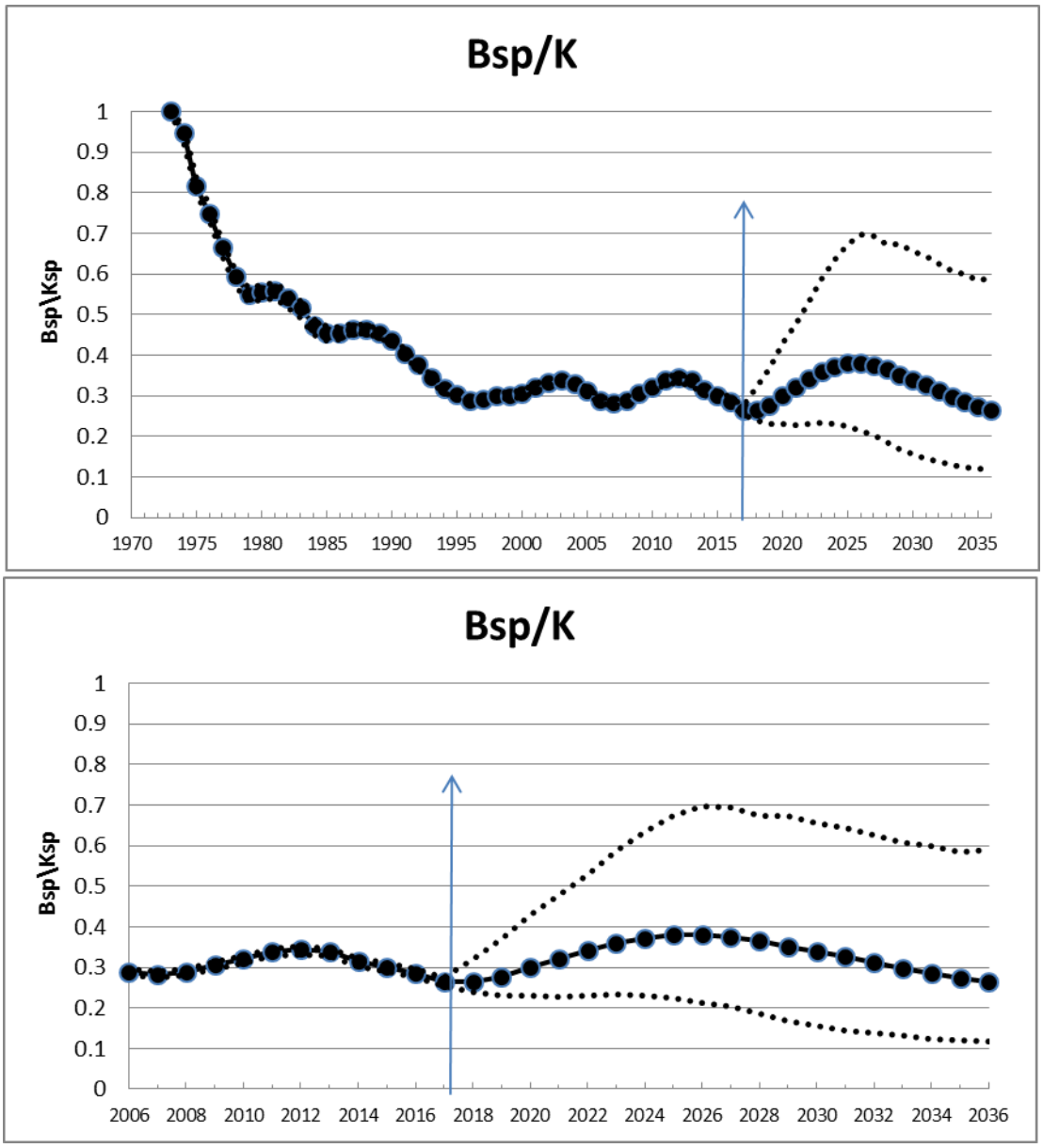


Figure 3: The median, 5th and 95th percentiles of the Bsp/K trajectories for CMP-**2019** (CPUE_targ=1.22). The lower plot is from 2006 onwards only.



Appendix: CMP-2019

An OMP for recommending the TAC for South Coast rock lobster resource was first developed and implemented for 2008[1] (Johnston and Butterworth 2008). A number of further OMPs have been developed for the management of this resource. The most recent, OMP-2014, has been used for a period of five years to set the SCRL TAC. OMP-2014 had a median target spawning biomass $B^{sp}_{2025}/B^{sp}_{2006}$ of 1.30 when simulation tested under the base case OM at that time, i.e. a spawning biomass increase in median terms of 30% over the 2006-2025 period.

CMP 2019

The TAC setting algorithm for CMP-2019

The algorithm used to recommend the TAC for the South Coast Rock Lobster fishery for season *y*+1 is:

$$TAC_{y+1} = TAC_y[1 + \alpha \frac{\overline{CPUE}_y - CPUE_{targ}}{CPUE_{targ}}] \quad (1)$$

where $\overline{CPUE}_y$ is a measure of recent CPUE and is calculated as follows:

$$\overline{\overline{CPUE}}_y = \frac{1}{3}\sum_{y'=y-3}^{y-1}\sum_{A=1}^{3}\lambda_A CPUE^A_{y'} \quad (2)$$

where

$CPUE^A_{y'}$ is the GLM standardised CPUE for area *A* in year y' and

the CPUE weighting factors, $\lambda_{A1E}, \lambda_{A1W}$ and λ_{A2+3} relate to the proportion of the overall biomass in each the three fishing areas, and were calculated using estimated values of *q* and B^{exp} for 2018 from the updated RC model to be:

$$\lambda_{A1E} = 0.006$$

$$\lambda_{A1W} = 0.006$$

$$\lambda_{A2+3} = 0.988$$

Note that TAC_y is the TAC set (not the catch taken) in season *y*.

The tuning parameter α controls how responsive the OMP is to CPUE deviations from the CPUE target, and for CMP-2019 is set to be 1.0.

[1] The convention used here is that 2008 refers to the 2008/2009 season

Note that the TAC for season *y+*1 is to be based upon the CPUE series that ends in season *y*-1, i.e. the TAC recommendation for the 2019 season would be based on a CPUE series that ended with the most recent CPUE value available at the time the TAC recommendation is required (August 2019) which would be the 2017 season.

Inter-annual TAC constraint

A rule to restrict the inter-annual TAC variation to no more than 5% up or down from season to season is applied as in previous OMPs, i.e.:

$$\text{if } TAC_{y+1} > 1.05TAC_y \qquad TAC_{y+1} = 1.05TAC_y \qquad (3)$$

$$\text{if } TAC_{y+1} < 0.95TAC_y \qquad TAC_{y+1} = 0.95TAC_y$$

Maximum CAP on TAC

A maximum cap on TAC in any year in the future is set at 450 MT.

Reference

Johnston, S.J. and D.S. Butterworth. 2008. OMP 2008 for the South Coast Rock Lobster Resource. MCM document, MCM/2008/AUG/SWG-SCRL/30. 8pp.