

South coast rock lobster TAC for the 2019 season

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Summary

The application of the new OMP-2019 results in a TAC of 321 MT for the 2019¹ season (the same TAC as that for 2018).

OMP-2019 TAC setting algorithm

Full details of the algorithm developed for setting the South Coast rock lobster TAC are available in Johnston and Butterworth (2019). In summary, the following equations apply:

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

where:

TAC_{y+1} is the TAC for the forthcoming season (2019 in this case),

TAC_y is the TAC from the previous season (i.e. $y=2018$),

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

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

where:

$CPUE_{y'}^A$ is the GLM standardized CPUE for area A in year y' (the values applicable to these calculations are as follows (Glazer, 2019)):

Year	Area 1E	Area 1W	Area 2+3
2015	1.97	1.50	1.04
2016	1.63	1.24	0.96
2017	1.61	1.38	1.41

λ_{1E} , λ_{A1W} and λ_{2+3} are CPUE weighting factors related to the proportion of the overall biomass in each of the three fishing areas (see Johnston and Butterworth (2019) for details), namely:

$$\lambda_{1E}=0.006$$

$$\lambda_{1W}=0.006$$

¹ The year 2019, for example, refers to the 2019/20 fishing season

$$\lambda_{2+3}=0.988$$

$CPUE_{target} = 1.22$ (the value for which the median $Bsp(2015/2006)=1.30$; the selected biomass recovery target for OMP-2019).

α is a tuning parameter that controls the responsiveness of the OMP to CPUE deviations from $CPUE_{target}$ and for OMP-2019 is set at 1.0.

A rule is applied to limit inter-annual TAC variation to no more than 5% in either direction (i.e. the TAC is limited to fluctuating between $\pm 5\%$ of the previous seasons TAC):

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

$$\text{if } TAC_{y+1} < 0.95TAC_y \quad \text{then} \quad TAC_{y+1} = 0.95TAC_y \quad (4)$$

TAC for first two seasons (2019 and 2020)

The TAC for the first two seasons may not be less than the TAC set for 2018 (321 MT).

The 2019 TAC calculation

The application of the equations described above results in a TAC of 321 tons for the 2019 season:

$$\overline{CPUE}_{2018} = \frac{1}{3} (0.006(1.97)+0.006(1.50)+0.998(1.04)+0.006(1.63)+0.006(1.24)+0.998(0.96)+0.006(1.61 +0.006(1.38)+0.998(1.41)) = 1.153$$

$$\begin{aligned} TAC_{2019} &= 321 \left[1 + 1.0 \left(\frac{1.153 - 1.22}{1.22} \right) \right] \\ &= 321[1 - 0.055] \\ &= 304 \text{ MT} \end{aligned}$$

This amounts to a 5.3% decrease in TAC from that of 2018 (321 tons). Since this decrease falls outside the lower 5% constraint related to TAC_{2018} the inter-annual TAC constraint must apply, thus the TAC_{2019} value is thus:

$$TAC_{2019} = 0.95 TAC_{2018} = 0.95 * 321 = 305 \text{ MT}$$

However, the final TAC rule is that the TAC for the first two seasons (2019 and 2020) may not be less than the TAC set for 2018 (321 MT) applies, thus the final TAC(2019)=321 MT.

References

Glazer, JP. 2019. South Coast Rock Lobster standardized CPUE indices per Area. Fisheries/2019/JUL/SWG-SCRL/09.

Johnston, S.J and Butterworth, D.S. 2019. South Coast Rock Lobster OMP 2019. Fisheries/2016/AUG/SWG-SCRL/10.