

Recommendations on rock lobster TACs for the Tristan group of islands for the 2020/21¹ season

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Executive Summary

OMPs are the agreed basis to recommend rock lobster TACs for all four islands of the Tristan da Cunha Group. The application of these OMPs using the most recent CPUE and survey data for input result in the following TACs.

The OMP for Tristan recommends the TAC for 2020 at **120 MT** (2019 TAC 120 MT).

The OMP for Nightingale recommends the TAC for 2020 at **89 MT** (2019 TAC 85 MT).

The OMP for Inaccessible recommends the TAC for 2020 at **98 MT** (2019 TAC 93 MT).

The OMP for Gough recommends the TAC for 2020 at **100 MT** (2019 TAC 105 MT).

The total TAC recommendation is thus 407 MT (this was 403 MT in 2019).

Introduction

New OMPs for Tristan and Nightingale (Johnston and Butterworth 2020 a,b) have recently been developed. OMPs for Inaccessible and Gough were developed in Johnston and Butterworth (2018). Thus OMPs have now been adopted for all four islands in the Tristan group for the purpose of scientific recommendations for TACs. All four of these OMPs have the same form, as set out below:

$$TAC_{y+1} = TAC_y + \alpha(I_y^{rec} - I^{tar})$$

where

I_y^{rec} is the average of the GLM standardized CPUE over the last three years ($y-2, y-1, y$),

I^{tar} is the CPUE target index, and

α is a tuning parameter – the larger the α value, the more “responsive” the OMP is to changes in the catch rate in the future.

¹ The convention used here is that the split season (e.g. 2016/17) is referred to as the “2016” season.

A rule to control the inter-annual TAC variation is also applied. The baseline % TAC change relative to the previous year (“max V%”) is restricted to a maximum of either max V% up and max V% down:

$$\text{If } TAC_{y+1} < (1 - \text{max V\% down})TAC_y \quad \text{then } TAC_{y+1} = (1 - \text{max V\% down}) TAC_y$$

$$\text{If } TAC_{y+1} > (\text{max V\% up}) TAC_y \quad \text{then } TAC_{y+1} = (\text{max V\% up}) TAC_y$$

Furthermore a maximum TAC (ceiling) or a minimum TAC (floor) may be imposed, where the latter is subject to Exceptional Circumstances (EC) rules where if I_y^{rec} drops below I_{lim} , the ECs apply and TAC decrease constrains are overridden.

Tristan

The final Tristan OMP accepted (CMP1 of Johnston and Butterworth 2020e) has:

J^{tar} the CPUE target index of 1.0,

α is 25,

max V% 5% up and 5% down,

I_{lim} 0.7 kg/trap,

TAC ceiling NA, and

TAC Floor 120 MT.

Tristan TAC for 2020

The updated standardised CPUE are reported in Johnston and Butterworth (2020a). Each data series is renormalised so that the average over 2010-2012 is 1.0.

The calculation of the recommended 2020 TAC for Tristan is as follows:

The combined J_{2020}^{rec} value:

$$\begin{aligned} J_{2020}^{rec} &= \frac{w_1 I_{2020}^{rec,comm} + w_2 I_{2020}^{rec,Edin} + w_3 I_{2020}^{rec,survey}}{w_1 + w_2 + w_3} \quad \text{i.e. used all three indices} \\ &= \frac{0.569 * 0.902 + 0.046 * 1.243 + 0.384 * 0.926}{1} \\ &= 0.926 \end{aligned}$$

$$\begin{aligned}
 TAC_{2020} &= TAC_{2019} + \alpha(J_{2020}^{rec} - J^{tar}) \\
 &= TAC_{2019} + 25(J_{2020}^{rec} - 1.0) \\
 &= 120 + 25(0.926 - 1.0) \\
 &= 118 \text{ MT}
 \end{aligned}$$

This TAC value is lower than the “TAC floor” of 120, but the J_{2020}^{rec} value of 0.926 is above the threshold I_{lim} value of 0.70 (thus ECs are not invoked). Accordingly the final TAC recommended for Tristan for the 2019 season is **120 MT**.

Nightingale

The final Nightingale OMP accepted has:

I^{tar}	the CPUE target index of 5.0 kg/trap,
α	is 5,
max V%	5% up and 5% down,
I_{lim}	3.0 kg/trap,
TAC ceiling	95 MT and,
TAC floor	NA.

Nightingale TAC for 2020

The updated standardized CPUE for Nightingale is reported in Johnston and Butterworth (2020d). The calculation of the 2020 TAC for Nightingale is as follows:

$$\begin{aligned}
 TAC_{2020} &= TAC_{2019} + \alpha(I_{2020}^{rec} - I^{tar}) \\
 &= TAC_{2019} + 5(I_{2020}^{rec} - 5.0)
 \end{aligned}$$

$$= 85 + 5(8.431 - 5.0)$$

$$= 102.16 \text{ MT}$$

This TAC value is greater than the maximum 5% increase from the previous TAC (85 MT); thus this TAC is adjusted to equal a 5% increase over the 85 MT, which is **89 MT**.

The I_{2020}^{rec} value of 8.431 is not below the metarule threshold I_{lim} value of 3.0 kg/trap, so the metarule is not invoked.

Given that 89 MT is below the TAC ceiling value of 95 MT, the final TAC remains **89 MT**.

Inaccessible

The final Inaccessible OMP accepted has:

I^{tar}	the CPUE target index of 5.0 kg/trap,
α	is 2.5,
max V%	5% up and 5% down,
I_{lim}	3.0 kg/trap,
TAC ceiling	NA, and
TAC floor	NA.

Inaccessible TAC for 2020

The updated standardized CPUE for Inaccessible is reported in Johnston and Butterworth (2020d). The calculation of the 2020 TAC for inaccessible is as follows:

$$TAC_{2020} = TAC_{2019} + \alpha(I_{2020}^{rec} - I^{tar})$$

$$= TAC_{2019} + 2.5(I_{2020}^{rec} - 5.0)$$

$$= 93 + 2.5(76.823 - 5.0)$$

$$= 97.56 \text{ MT}$$

This TAC value is less than the maximum 5% increase from the previous TAC (93 MT); thus this TAC is not re-adjusted to equal a 5% increase above 93 MT.

The I_{2020}^{rec} value of 6.823 is not below the metarule threshold I_{lim} value of 3.0 kg/trap, so the metarule is not invoked.

The final TAC(2020) is thus **98 MT**.

Gough

The final OMP accepted has:

I^{tar}	the CPUE target index of 6.0 kg/trap,
α	is 10,
max V%	5% up and 5% down,
I_{lim}	3.0 kg/trap,
TAC ceiling	NA, and
TAC floor	NA.

Gough TAC for 2020

The updated standardized CPUE for Inaccessible is reported in Johnston and Butterworth (2020d). The calculation of the 2020 TAC for Nightingale is as follows:

$$\begin{aligned} TAC_{2020} &= TAC_{2019} + \alpha(I_{2020}^{rec} - I^{tar}) \\ &= TAC_{2019} + 10(I_{2020}^{rec} - 6.0) \\ &= 105 + 10(4.996 - 6.0) \end{aligned}$$

$$= 89.5 \text{ MT}$$

This TAC value is less than the maximum 5% decrease from the previous TAC (105 MT); thus this TAC is adjusted to $0.95 * \text{TAC}_{2019} = 100 \text{ MT}$.

The I_{2020}^{rec} value of 4.45 is not below the metarule threshold I_{lim} value of 3.0 kg/trap, so the metarule is not invoked.

The final TAC(2020) is thus **100 MT**.

References

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