

RECOMMENDATIONS ON ROCK LOBSTER TACs FOR THE TRISTAN GROUP OF ISLANDS FOR THE 2018/19¹ SEASON

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Executive Summary

OMPs have recently been accepted as the basis to recommend rock lobster TACs for all four islands of the Tristan da Cunha Group. The application of these OMPs together with the most recent standardized CPUE data result in the following TACs.

The OMP for Tristan sets the TAC for 2018 at **120 MT**.

The OMP for Nightingale sets the TAC for 2018 at **83 MT**.

The OMP for Inaccessible sets the TAC for 2018 at **89 MT**.

The OMP for Gough sets the TAC for 2018 at **111 MT**.

Tristan

Introduction

An updated OMP for the Tristan da Cunha island fishery was recently developed (see Johnston and Butterworth 2016, Johnston and Glass 2017). This OMP continues to be a target-based OMP with the target (Itar) being the average of the 2010-2012 GLM standardized CPUE values (1.257 kg/trap/day). A new rule added is that a TAC “floor” of 120 tons is set, BUT there is a lower limit (Ilim) in the observed recent standardized CPUE 3-yr average below which this 120t floor rule is over-ruled on the basis of Exceptional Circumstances (ECs) having occurred. This updated OMP is described in detail in Johnston and Butterworth (2016). Essentially the EC rule comes into play if the most recent 3-yr average CPUE level drops below 0.9 kg/trap/day (see Johnston and Glass 2017).

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

Tristan TAC for 2018

The updated standardised CPUE are reported in Johnston *et al.* (2017). The calculation of the 2018 TAC for Tristan is as follows:

$$\begin{aligned}
 TAC_{2018} &= TAC_{2017} + \alpha(I_{2018}^{rec} - I^{tar}) \\
 &= TAC_{2017} + 25(I_{2018}^{rec} - 1.257) \\
 &= 120 + 25(1.109 - 1.257) \\
 &= 116 \text{ MT}
 \end{aligned}$$

This TAC value is lower than the “floor” of 120, and the I_{2018}^{rec} value is above the threshold Ilim value of 0.90 (thus ECs are not invoked). Accordingly the final TAC recommended for Tristan for the 2018 season is **120 MT**.

Nightingale

Introduction

An OMP for Nightingale was developed in 2017 (Johnston and Butterworth 2018). The OMP is based on the same structure as that for recent Tristan, Inaccessible and Gough OMPs (see Johnston and Butterworth 2014). This is a target-based rule based on the recent commercial CPUE, *viz.*:

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

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.

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 up 5% down 5%:

If $TAC_{y+1} < 0.95TAC_y$ then $TAC_{y+1} = 0.95TAC_y$

If $TAC_{y+1} > 1.05TAC_y$ then $TAC_{y+1} = 1.05TAC_y$

Furthermore a ceiling (upper bound) on the TAC is introduced:

If $TAC_{y+1} > TAC_{ceiling}$ then $TAC_{y+1} = TAC_{ceiling}$

As for the other OMPs that have been developed, a precautionary metarule rule is also incorporated into the OMP, where the 5% TAC decrease constraint is increased to up to 20% if the (catch rate) index drops below a threshold (Ilim) level. Here the baseline Ilim level is set at 3.0 kg/trap.

The final 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,

Ilim 3.0 kg/trap, and

$TAC_{ceiling}$ 85 MT.

Nightingale TAC for 2018

The updated standardized CPUE for Nightingale is reported in Johnston and Butterworth (2017). The calculation of the 2018 TAC for Nightingale is as follows:

$$\begin{aligned} TAC_{2018} &= TAC_{2017} + \alpha(I_{2018}^{rec} - I^{tar}) \\ &= TAC_{2017} + 2.5(I_{2018}^{rec} - 5.0) \\ &= 79 + 2.5(10.977 - 5.0) \\ &= 93.94 \text{ MT} \end{aligned}$$

This TAC value is greater than the maximum 5% increase from the previous TAC (79 MT); thus this TAC is adjusted to equal a 5% increase over the 79 MT, which is **83** MT.

The I_{2018}^{rec} value of 10.977 is not below the metarule threshold *Ilim* value of 3.0 kg/trap, so the metarule is not invoked.

Given that the $TAC_{ceiling}$ value of 85 MT is not exceeded, the final TAC is **83 MT**.

Inaccessible

An updated OMP for Inaccessible was developed in 2018 (Johnston and Butterworth 2018a). The OMP is based on the same structure as that for the recent Tristan and Nightingale OMPs (see Johnston and Butterworth 2014). This is a target-based rule based on the recent commercial CPUE, *viz.*:

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

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.

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 up 5% down 5%:

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

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

As for the other OMPs that have been developed, a precautionary metarule rule is also incorporated into the OMP, where the 5% TAC decrease constraint is increased to up to 20% if the (catch rate) index drops below a threshold (*Ilim*) level. Here the Inaccessible baseline *Ilim* level is set at 3.0 kg/trap.

The final 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,

Ilim 3.0 kg/trap, and

Inaccessible TAC for 2018

The updated standardized CPUE for Inaccessible is reported in Johnston and Butterworth (2018b). The calculation of the 2018 TAC for Nightingale is as follows:

$$\begin{aligned} TAC_{2018} &= TAC_{2017} + \alpha(I_{2018}^{rec} - I^{tar}) \\ &= TAC_{2017} + 2.5(I_{2018}^{rec} - 5.0) \\ &= 85 + 2.5(7.233 - 5.0) \\ &= 90.58 \text{ MT} \end{aligned}$$

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 above 85 MT, which is **89 MT**.

The I_{2018}^{rec} value of 7.233 is not below the metarule threshold Ilim value of 3.0 kg/trap, so the metarule is not invoked.

The final TAC(2018) is thus **89 MT**.

Gough

An updated OMP for Gough was developed in 2018 (Johnston and Butterworth 2018a). The OMP is based on the same structure as that for the recent Tristan, Nightingale and Inaccessible OMPs (see Johnston and Butterworth 2014). This is a target-based rule based on the recent commercial CPUE, viz.:

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

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.

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 up 5% down 5%:

$$\text{If } TAC_{y+1} < 0.95TAC_y \quad \text{then } TAC_{y+1} = 0.95TAC_y$$

$$\text{If } TAC_{y+1} > 1.05TAC_y \quad \text{then } TAC_{y+1} = 1.05TAC_y$$

As for the other OMPs that have been developed, a precautionary metarule rule is also incorporated into the OMP, where the 5% TAC decrease constraint is increased to up to 20% if the (catch rate) index drops below a threshold (Ilim) level. Here the Gough baseline Ilim level is set at 3.0 kg/trap.

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,

Ilim 3.0 kg/trap, and

Gough TAC for 2018

The updated standardized CPUE for Inaccessible is reported in Johnston and Butterworth (2018b). The calculation of the 2018 TAC for Nightingale is as follows:

$$\begin{aligned} TAC_{2018} &= TAC_{2017} + \alpha(I_{2018}^{rec} - I^{tar}) \\ &= TAC_{2017} + 10(I_{2018}^{rec} - 6.0) \\ &= 116 + 210(5.450 - 6.0) \\ &= 111 \text{ MT} \end{aligned}$$

This TAC value is within than the maximum 5% decrease from the previous TAC (116 MT); thus this TAC need not be adjusted further and is 111 MT.

The I_{2018}^{rec} value of 5.450 is not below the metarule threshold I_{lim} value of 3.0 kg/trap, so the metarule is not invoked.

The final TAC(2018) is thus **111 MT**.

References

Johnston, S.J. and D.S. Butterworth. 2014. Initial OMP candidates for the Inaccessible and Gough rock lobster fisheries. MARAM document, MARAM/TRISTAN/2014/FEB/03.

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Table 1: The updated (2018) GLMM CPUE (kg/trap) series used for the I_{2018}^{rec} calculations.

Season	Tristan	Nightingale	Inaccessible	Gough
2015	0.971	9.370	5.915	7.453
2016	1.173	13.100	7.540	5.619
2017	1.184	10.461	8.245	3.277
Average (I_{2018}^{rec})	1.109	10.984	7.233	5.450