RECOMMENDATIONS ON ROCK LOBSTER TACs FOR THE TRISTAN GROUP OF ISLANDS FOR THE 2017/18[1] SEASON

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Executive Summary

OMPs have recently been accepted as the basis to recommend TACs for Tristan, Inaccessible and Gough islands. Given that for Inaccessible and Gough the recent catch rates continue to be above the associated OMP's target catch rate, the OMPs indicate increases to the TACs for both islands for the 2016 season:

Inaccessible: 81 MT to **85** MT

Gough: 110 MT to **116** MT

The updated OMP for Tristan sets the TAC for 2017 at **120 MT**.

The newly developed OMP for Nightingale sets the TAC at either **75 MT** or **78.75 MT** depending on which final value for the $TAC_{ceiling}$ is selected for the OMP (either 75 MT or 85 MT).

Inaccessible and Gough

Introduction

OMPs were developed and agreed upon for both Inaccessible and Gough islands, and used to set the TACs at these islands for the first time for the 2014 season and again for the following 2015 and 2016 seasons. Johnston and Butterworth (2014) provides details of these OMPs. For Inaccessible the "CMP3+metarule 2" is the final agreed OMP, and for Gough the "CMP20+metarule1". Both these OMPs are target-based, with the TAC setting formula being of the form:

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

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

where

I_y^{rec} is the average of the GLMM standardized CPUE over the last three seasons (*y*-2, *y*-1,*y*),

I^{tar} is the CPUE target (4 for Inaccessible and 4.5 initially for Gough, dropping to 2.8 in 2017), and

α is the tuning parameter (2.5 for Inaccessible and 10 for Gough).

A rule to control the inter-season TAC variation is also applied. Normally the percentage TAC change relative to the previous season is restricted to a maximum of either up 5% down 5%, i.e.:

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

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

However, in addition, an Exceptional Circumstances metarule for each of Inaccessible and Gough may be applied under certain circumstances, where the 5% TAC decrease constraint is increased to as much as 20% if the (catch rate) index drops below a threshold level. This metarule allows for the TAC to be reduced further than the usual maximum 5% decrease, as shown in Figure 1. For Inaccessible, *a* is set at 4 kg/trap, and for Gough *a* is set at 1.5 kg/trap.

GLMM analyses including the most recent (2016) season's CPUE longline data have recently been completed (Johnston *et al.* 2017). These analyses provide the input data used in setting the TACs for the 2017 season for Inaccessible and Gough. Table 1 reports the values used in the calculation of the I_y^{rec} values.

Inaccessible TAC for 2017

The calculation of the 2017 TAC for Inaccessible is as follows:

$$TAC_{2017} = TAC_{2016} + \alpha(I^{rec}_{2017} - I^{tar})$$

$$TAC_{2017} = TAC_{2016} + 2.5(I^{rec}_{2017} - 4)$$

$$TAC_{2017} = 81 + 2.5(6.462 - 4)$$

$$TAC_{2017} = 87.16\ MT$$

This TAC value is greater than the maximum 5% deviation from the previous TAC (81 MT), thus the final TAC recommended for Inaccessible for the 2015 season is 81*1.05=**85 MT.** The I^{rec}_{2016} value of 6.462 is not below the metarule threshold level (4 kg/trap), so that the final TAC recommended for Inaccessible for 2017 is **85 MT.**

Gough TAC for 2017

The calculation of the 2017 TAC for Gough is similar, and as follows:

$$TAC_{2017} = TAC_{2016} + \alpha(I^{rec}_{2017} - I^{tar})$$

$$TAC_{2017} = TAC_{2016} + 10(I^{rec}_{2017} - 2.8)$$

$$TAC_{2017} = 110 + 10(6.818 - 2.8)$$

$$TAC_{2017} = 150\ MT$$

This TAC value is greater than the maximim 5% increase from the previous TAC (110 MT); thus this TAC is adjusted to equal a 5% increase over the 110 MT, which is 116 MT. The I^{rec}_{2016} value of 6.818 is not below the metarule threshold level (1.5 kg/trap), so that the final TAC recommended for Gough for 2016 is **116 MT.**

Nightingale

Introduction

An OMP for Nightingale has recently been developed (Johnston and Butterworth 2017). The OMP is based on the same structure as that for the current Tristan, Inaccessible and Gough OMPs (see Johnston and Butterworth 2013 and 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 (the average GLM standardised 2008-2010 of 3.689 is used),

and

α is a tuning parameter which is varied here from 2.5 to 10. The larger the α value, the more "responsive" the OMP will be 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, the addition of 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 recommended TAC has:

I^{tar} the CPUE target index of 3.689 (the average GLM standardised 2008-2010 – these are the three years prior to the OLIVA event),

α	is 2.5,
max V%	5% up and 5% down,
Ilim	3.0 kg/trap, and
$TAC_{ceiling}$	75 MT or 85 MT.

Nightingale TAC for 2017

The calculation of the 2017 TAC for Nightingale is as follows:

$$TAC_{2017} = TAC_{2016} + \alpha(I^{rec}_{2017} - I^{tar})$$

$$TAC_{2017} = TAC_{2016} + 2.5(I^{rec}_{2017} - 3.689)$$

$$TAC_{2017} = 75 + 2.5(10.959 - 3.689)$$

$$TAC_{2017} = 93.18\ MT$$

This TAC value is greater than the maximim 5% increase from the previous TAC (75 MT); thus this TAC is adjusted to equal a 5% increase over the 75 MT, which is **78.75** MT.

The I^{rec}_{2017} value of 10.959 is not below the metarule threshold Ilim value of 3.0 kg/trap, so the metarule is not invoked.

If the $TAC_{ceiling}$ value of 85 MT is the accepted OMP value, then the final TAC is 78.75 MT.

If the $TAC_{ceiling}$ value of 75 MT is the accepted OMP value, then the final TAC is 75 MT.

Tristan

Introduction

An updated OMP for the Tristan da Cunha island fishery was recently developed (see Johnston and Butterworth 2016d, 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 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 2016d. Essentially the EC rule comes into play once the recent 3-yr CPUE level drops below 0.9 kg/trap/day (see Johnston and Glass 2017).

Tristan TAC for 2017

The calculation of the 2017 TAC for Tristan is as follows:

$$TAC_{2017} = TAC_{2016} + \alpha(I^{rec}_{2017} - I^{tar})$$

$$TAC_{2017} = TAC_{2016} + 25(I^{rec}_{2017} - 1.257)$$

$$TAC_{2017} = 120 + 25(0.973 - 1.257)$$

$$TAC_{2017} = 113\ MT$$

This TAC value is lower than the "floor" of 120, and the I^{rec}_{2016} value is above the threshold Ilim value of 0.90 (thus ECs are not invoked). Accordingly the final TAC recommended for Tristan for the 2016 season is **120 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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Johnston, S.J. and Glass, J.P. 2017. The amended Tristan OMP. MARAM/TRISTAN/2017/MAY/05.

Johnston, S.J. and D.S. Butterworth. 2017. Initial OMP candidates for the Nightingale rock lobster fishery. MARAM document, MARAM/TRISTAN/2017/JUL/08.

Table 1: The updated (2017) GLMM CPUE (kg/trap) series for Inaccessible, Gough and Nightingale and GLM CPUE for Tristan to be used for the I_{2017}^{rec} calculations.

Season	Inaccessible	Gough	Tristan	Nightingale
2014	7.011	7.278	0.787	10.646
2015	5.523	7.509	0.965	9.265
2016	6.853	5.667	1.168	12.965
Average (I_{2017}^{rec})	**6.462**	**6.818**	**0.973**	**10.959**

Figure 1: The Exceptional Circumstances metarule implemented for Inaccessible and Gough; the values of the parameter *a* are respectively 4 and 1.5.