

RECOMMENDATIONS ON ROCK LOBSTER TAC's FOR THE TRISTAN GROUP OF ISLANDS FOR THE 2012/13 SEASON

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SUMMARY

Based on the similar approach as used last year, but updated to take account of recent decisions about the probable impact of the OLIVA incident on the resource at Nightingale and Inaccessible, and on the lobster growth rates to use in the calculations, TACs have been calculated for all four islands. These calculations indicate large reductions at Inaccessible and Gough, which follow primarily from a further decrease in CPUE at the former, and a curtailment of the previous increase at the latter. Given the intended move to a management procedure approach for setting catch limits by next year, and taking cognisance of the greater industrial stability that such an approach intends, it is recommended that the TAC reductions as now calculated for Inaccessible and Gough be considered as being phased in over two years. Consequently the TAC recommendations for the 2012/13 season are:

Inaccessible	44 mt	(decrease of 9 mt)
Nightingale	Closed	
Tristan	173mt	(decrease of 1 mt)
Gough	88 mt	(decrease of 7 mt)
Total	302 mt	(decrease of 17 mt)

Note that the recommendation for Nightingale is provisional, pending further test fishing results to become available during the season. There are aspects of the calculations for Gough which merit revisiting, so that the recommendation there is also desirably considered provisional. The possibility of decreasing the size limit at Inaccessible given the large fraction of lobsters caught being discarded there merits consideration, but first calculations need to be conducted to quantify the possible associated advantages and disadvantages. This work is ongoing and initial results on which recommendations can be based are anticipated in September 2012.

BACKGROUND

The assessment models used to provide advice for TACs for the islands have been updated recently to take into account the most recent data collected from the fishery. These include CPUE data, length distribution data from the fishery, data on discards, and estimates of lobster growth rates.

Advice must be given with long-term objectives for the fishery in mind. The objective for this fishery is to achieve target exploitable biomasses of the resource at each island, and hence associated catch rates. Last year this was based on a "balanced intermediate strategy" of a RY (replacement yield) intended to keep the exploitable biomass at its (pre-OLIVA) 2011 level into the future, and a RY set to get $B_{sp}/K \sim 0.85$ in the long term future (2061). However, following the OLIVA incident and estimates of the consequent loss of yield, this has been modified slightly to focus on moving towards and maintaining the exploitable biomass at its pre-OLIVA 2011 level, as detailed further below.

One of the major uncertainties that needs to be considered relates to the estimate of the lobster growth rate at each island. In two cases this estimate is particularly uncertain, so that results are shown for two alternative growth models, with averages taken over these two models to obtain a final estimate for long-term balanced RY

above. The other major uncertainty to consider relates to the extent of any damage caused at Nightingale and Inaccessible islands in March 2011 as a result of oil and soya spills from the OLIVA grounding and break-up.

METHODS AND RESULTS

The updated assessments (see Appendix) provide estimates of current exploitable biomass (and hence CPUE) in 2011. These are reported in Table 1 as the “Target Biomass” values. The objective decided last year is to attempt to achieve and maintain the fishery at such “Target Biomass” values into the future. Previously this target biomass was to be achieved smoothly over the long term (by 2066). Since the OLIVA incident occurred, a slightly more complex method has been employed to estimate the replacement yields (RYs) required to achieve this objective without too large an immediate drop in catch, if possible. RYs for four different periods have been calculated at all four islands in order to achieve the “Target Biomass” values in all of 2016 (if possible), 2021, 2031 and 2061 (see Johnston and Butterworth (2011) for further details of this approach).

Note that as for previous RY calculations, the following apply:

- 1) Future recruitment levels: the assessment models estimate the recruitment variability for the period 1992-2007 (previous assessment estimated 1992-2005). For the period 2008+ it is not possible to estimate recruitment trends from the data so that one needs to make an assumption about recruitment level for the 2008+ period. Here it is assumed that the average of the 1998-2007 recruitment level applies to the 2008+ future (last year the 1998-2005 average was used). As last year, this is considered a conservative option, as the assessments estimate a higher recruitment just prior to 1998, which may re-occur in the future. However the more cautious approach of waiting for indications of this in new data before assuming that this will indeed happen is preferred as a basis for advice at this stage.
- 2) Future fishing selectivity: the future fishing selectivity is assumed to remain at that estimated for recent years.

Table 1 reports these RY values under the assumption that no OLIVA incident occurred. Both growth models are explored for Nightingale and Gough – with results also reported for an average of the two.

Table 2 reports similar values, but here calculations of the RYs take into account the effect of the OLIVA incident at Inaccessible and Nightingale islands, which are considered to have been as follows:

Inaccessible: Oil effect on juveniles (ages 1, 2, and 3 year olds) – 35% mortality

Nightingale : Oil effect on juveniles (ages 1, 2, and 3 year olds) – 80% mortality

Nightingale : Soya effect on adults (ages 4+ year olds) – 50% mortality

These assumptions are those agreed at the November 2011 workshop held in Cape Town.

Table 3 lists the TAC’s which would follow for the 2012/13 season, and compares these with the original TACs set for the 2011/12 season and those TACs that were “updated” following the OLIVA incident.

DISCUSSION

The results in Table 3 suggest substantial reductions in the TAC at Inaccessible (53 to 34 mt) and at Gough (from 95 to 80.5 mt). Although the methodology applied has changed in some ways since last year, in particular following agreements reached in regard to taking account of the OLIVA incident, the primary reason for the first of these reductions is clear from inspection of the updated assessment plot in the Appendix (Fig. A1). This shows for Inaccessible that further lower CPUE values in the last two years, plus model refinements which lead to a

better fit to these data, now result in a marked decline in estimated abundance (a reflection of worse recruitment) since the 2005/06 season.

The reason underlying the new result for Gough is less obvious. There have been some methodological refinements, and the relatively low 2010/11 CPUE compared to the high value in 2009/10.(see Fig. A3 of Appendix) will lead to a more conservative result. Possibly though the key reason is that the revised assessment is concluding that the 2011 CPUE is close to that expected for the pristine resource – an abundance level at which there is no surplus production so that RY starts dropping towards zero as this is approached, i.e. a strategy to maintain the 2011 CPUE would then be inappropriately wasteful of the resource. In the time available it has not been possible to examine the results for Gough more closely to be certain what their main cause is, and furthermore comparison with Ovenstone’s records for Gough suggest that the 2009/10 CPUE value used should be rechecked.

It also needs to be kept in mind that by next year it is planned to have moved to a management procedure approach which may see an alteration in some targets once objectives are refined, and furthermore would be likely to impose restrictions on any inter-annual TAC changes to less than the amounts reflected above, in the interests of enhanced industrial stability. The Tristan rock lobsters are a relatively long-lived species, so that TAC changes can effectively be phased in over time without putting the resource at risk.

In these circumstances, it is recommended that the TAC reductions suggested in Table 3 for Inaccessible and Gough be considered as to be phased in over two years, so that for 2012/13 the TAC recommendations (rounding to the nearest ton) are:

Inaccessible	44 mt	(decrease of 9 mt)
Nightingale	Closed	
Tristan	173mt	(decrease of 1 mt)
Gough	88 mt	(decrease of 7mt)
Total	305 mt	(decrease of 17 mt)

Unless further evaluations in the process of moving to a management procedure approach indicate otherwise, similar further reductions at Inaccessible and Gough should be anticipated for the following season.

Note that the recommendation for Nightingale is provisional, pending the results of test fishing to be undertaken during the coming season. Furthermore, for the reasons given above, it is suggested that the recommendation for Gough be regarded only as a minimum at this stage, to allow for the additional checks of data and analyses set out above to be pursued.

The fishery has also been experiencing problems with large discard rates, particularly at Inaccessible. There is a potential case to lower the size limit there, as discarding, particularly if repeated for the same lobster, leads to additional mortality. Assessment calculations to examine the possible benefits and disadvantages of such a change are to be pursued, and might in a matter of months lead to a recommendation for consideration of a size limit change in mid-season if this is possible.

REFERENCE

Johnston, S.J. and D.S. Butterworth. 2011. Effect of the 2011 oil and soya spill events on rock lobster yields at Inaccessible and Nightingale islands. MARAM document, MARAM/TRISTAN/2011/SEP/13.

Table 1: The RY values (MT) estimated for each island assuming that **no OLIVA** incident occurred.

	Target Biomass	RY 2012-2015	RY 2016-2020	RY 2021-2030	RY 2030-2060
Inaccessible	364 MT	103	98	98	98
Nightingale:					
Pollock growth	248 MT	77	61	61	61
James Glass Growth	247 MT	63	60	60	60
Average		70	60.5	60.5	60.5
Tristan	481 MT	173	165	165	165
Gough:					
Pollock growth	217 MT	81	85	87	87
James Glass Growth	209 MT	80	87	88	88
Average		80.5	86	87.5	87.5
TOTAL		426.5	409.5	411	411

Table 2: The RY values (MT) estimated for each island when taking the OLIVA incident into account. (Note the values for Tristan and Gough are the same as for Table 1, as there was no OLIVA effect at these islands.)

	Target Biomass	RY 2012-2015	RY 2016-2020	RY 2021-2030	RY 2030-2060
Inaccessible	364 MT	34	98	98	98
Nightingale:					
Pollock growth	248 MT	0	0	60	61
James Glass Growth	247 MT	0	19	60	60
Average		0	9.5	60	60.5
Tristan	481 MT	173	165	165	165
Gough:					
Pollock growth	217 MT	81	85	87	87
James Glass Growth	209 MT	80	87	88	88
Average		80.5	86	87.5	87.5
TOTAL		287.5	358.5	410.5	411

Table 3: TACs (MT) for the 2012/13 season based on RY calculations and taking the OLIVA incident into account. Note discussion in the text motivated that the reductions indicated at Inaccessible and Gough be phased in over two years.

Inaccessible	Inaccessible	Nightingale	Tristan	Gough	Total
TAC 2011/12 Prior to OLIVA incident [#]	95	65	174	95	429
Reduced TAC 2011/12 post OLIVA incident	53	0	174	95	322
2012/13 TAC indicated taking OLIVA incident into account where relevant	34	0*	173	80.5*	287.5

*average of the Pollock and James Glass growth model values

[#] based on a “balanced intermediate strategy” of a RY intended to keep the exploitable biomass at its (pre-OLIVA) 2011 level into the future, and a RY set to get $B_{sp}/K \sim 0.85$ in the long term future (2061). Note too that the Nightingale and Gough results were based on the James Glass growth model at this stage, whereas in line with agreements at the November 2011 workshop, the averages of the Pollock and James Glass growth models are now used.

Appendix: Plots of updated assessments showing model fitted exploited biomass fitted to observed CPUE trends.

Notes: A document detailing these updated assessments is in preparation.
 In the plots, the year 2009, for example, refers to the 2009/10 season

Figure A1: Inaccessible

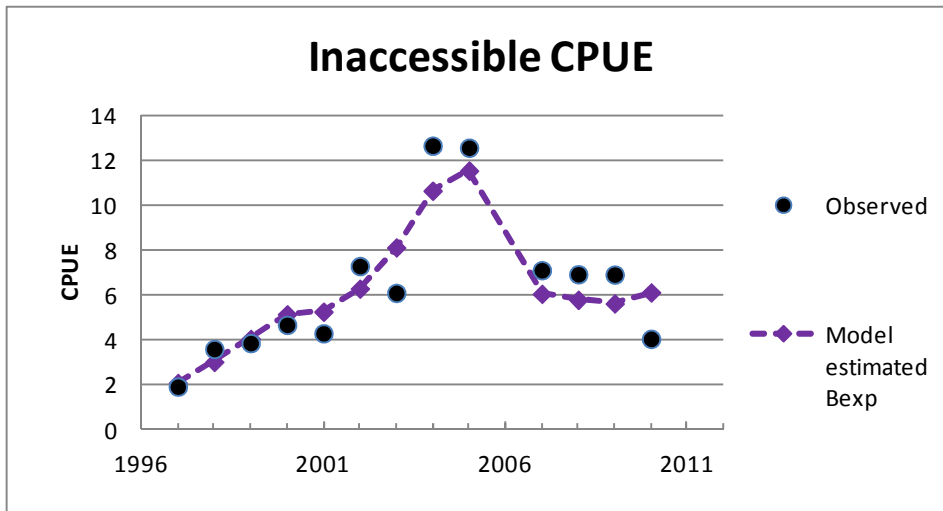


Figure A2: Nightingale

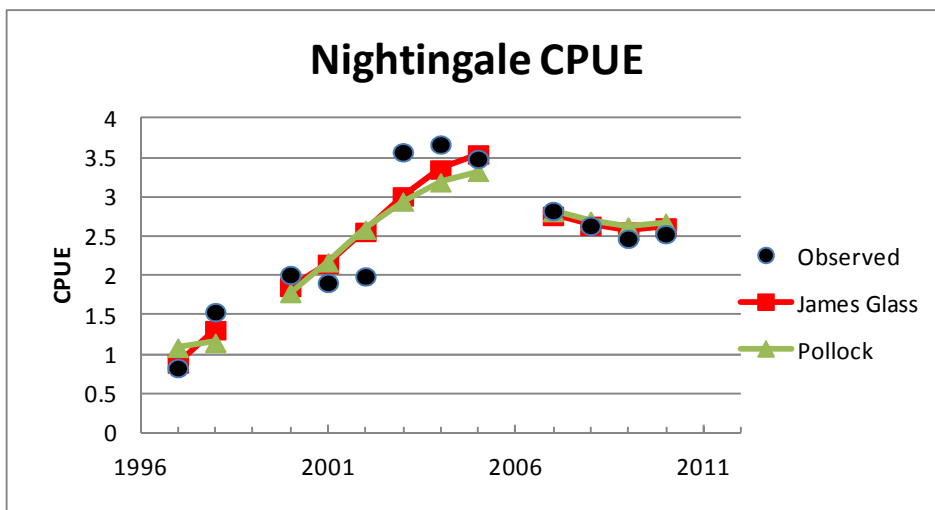


Figure A3: Gough

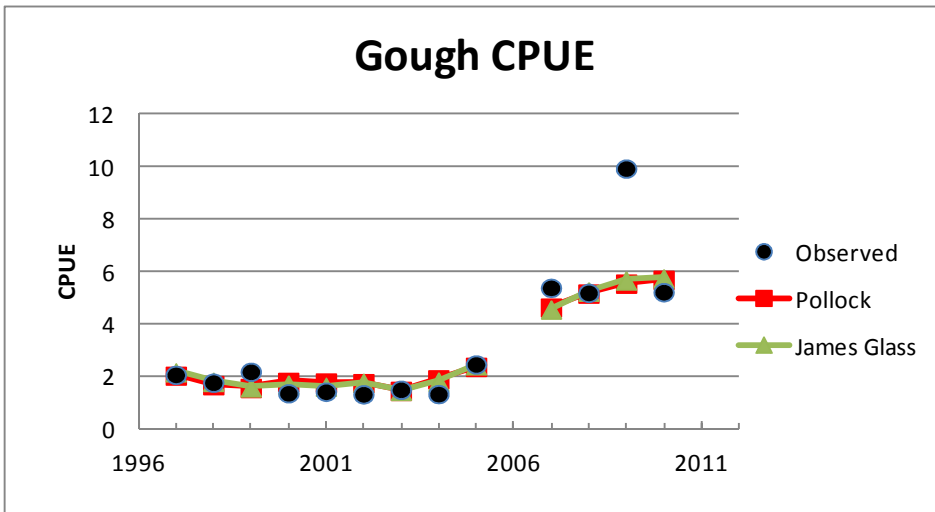


Figure A4: Tristan

