Recommended TAC 2008 from the new OMP for the South Coast Rock Lobster Resource

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Introduction

Johnston and Butterworth (2008) reports expected results for the final OMP 2008 for the South Coast Rock Lobster fishery. This OMP

1. has a 5% maximum TAC change constraint, and
2. has a median anticipated B^{sp} (2025/2006) of 1.20 under operating Model 3 (MARAM TVS).

TAC 2008 recommendation from OMP 2008

Table 1 and Figure 1 report the recently updated CPUE series for the South Coast rock lobster (Glazer 2008). These input CPUE used in conjunction with the new OMP 2008 produce a TAC recommendation for the 2008 season of **363 MT**. The Appendix provides the detailed calculation of TAC 2008.

References

Glazer, J.P. 2008. A generalized linear model applied to the South Coast rock lobster CPUE data to obtain area-specific indices of abundance. MCM document, MCM/2008/JUL/SWG-SCRL/20.

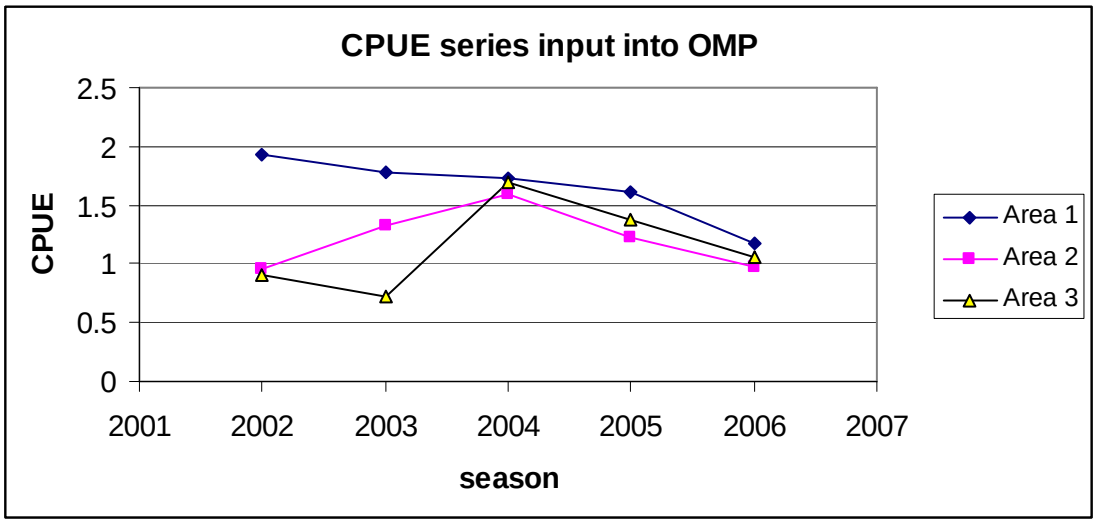
Johnston, S.J. and D.S. Butterworth. 2008. Results of the final OMP 2008 selected for the South Coast Rock Lobster Resource. MCM document, MCM/2008/AUG/SWG-SCRL/XX.

Johnston, S.J., Butterworth, D.S. and J.P. Glazer. 2008. OMP 2008 for the South Coast Rock Lobster Resource. MCM document, MCM/2008/AUG/SWG-SCRL/ZZ.

Table 1: CPUE input data into OMP 2008 (Glazer 2008).

Season	Area 1	Area 2	Area 3
2002	1.9223	0.9504	0.9116
2003	1.7866	1.3173	0.7173
2004	1.7346	1.6022	1.6895
2005	1.6168	1.2213	1.3688
2006	1.1821	0.9785	1.0630

Figure 1: CPUE input data into OMP 2008 (Glazer 2008).



Appendix: Detailed calculation of TAC 2008 using OMP 2008

Johnston *et al.* (2008) provides the details of OMP 2008. We reproduce the key OMP equations below showing how the new TAC 2008 is calculate.

TAC setting algorithm
The algorithm used to set the total TAC for the South Coast Rock Lobster fishery is:

$$TAC_{y+1} = TAC_y[1+\alpha(s_y - \delta)]h(r_y) \quad (1)$$

where

the value of α is set at 3.0;

s_y^A is the slope parameter from a regression of $\ln CPUE_y^A$ against *y* over the last five years of available data (1992-2006) for each area *A*, and

$$s_y = \sum_{A=1}^{3} w^A s_y^A \quad (2)$$

where $w^A = \dfrac{\dfrac{1}{\sigma_S^{A^2}}}{\sum_{A'=1}^{3}(\dfrac{1}{\sigma_S^{A'^2}})}$ (3)

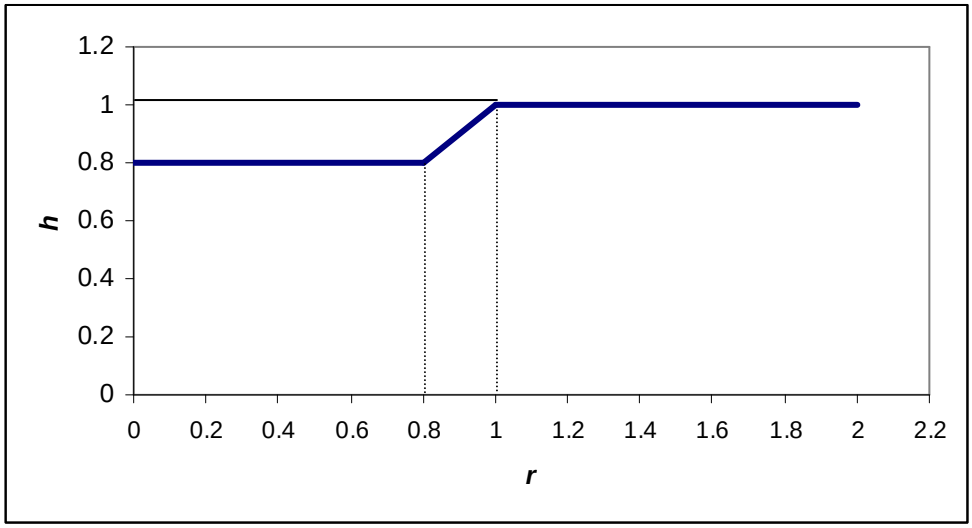
and σ_S^A is the standard error of the regression estimate of s_y^A and is bounded below at 0.15.

δ is a control parameter value and is tuned to be equal to -0.006 for the selected OMP 2008.

Also,

$$\begin{aligned} h(r) &= 0.8 \quad \text{for} \quad r \le 0.8 \\ &= r \quad \text{for} \quad 0.8 \le r \le 1.0 \\ &= 1.0 \quad \text{for} \quad r \ge 1.0 \end{aligned} \quad (4)$$

i.e.



and r is the ratio of recent CPUE to that at the time the OMP commences:

$$\overline{\overline{CPUE}}_{init} = \frac{1}{3}\sum_{y'=2003}^{2005}\sum_{A=1}^{3}\lambda_A CPUE^{A}_{y'} \quad (5)$$

$$\overline{\overline{CPUE}}_{y} = \frac{1}{3}\sum_{y'=y-3}^{y-1}\sum_{A=1}^{3}\lambda_A CPUE^{A}_{y'} \quad (6)$$

$$r_y = \frac{\overline{\overline{CPUE}}_{y}}{\overline{\overline{CPUE}}_{init}} \quad (7)$$

where

$\lambda_1 = 0.28$

$\lambda_2 = 0.55$

$\lambda_3 = 0.17$

Thus before any inter-annual constraints,

$TAC_{2008} = TAC_{2007}[1+3(-0.05822-(-0.006))](0.931887)$

$TAC_{2008} = 382[1+3(-0.05822-(-0.006))](0.931887)$ …….. Eqn (1)

$TAC_{2008} = 300.22$ MT

where

$$r_{2007} = \frac{\overline{\overline{CPUE}}_{2007}}{\overline{\overline{CPUE}}_{init}} = \frac{1.4526}{1.3537} = 0.931887 \quad \text{…….Eqn (7)}$$

And hence $h(r) = 0.931887$ ……....Eqn (4)

$$s_y = \sum_{A=1}^{3} w^A s_y^A = (-0.10723*0.6469)+(0.00174*0.2319)+(0.095349*0.1212) \quad \text{Eqn (2)}$$

$$= -0.05822$$

The σ values of Eqn (3) which are bound below by 0.15 are:

$\sigma_S^1 = 0.15$

$\sigma_S^2 = 0.251$

$\sigma_S^3 = 0.347$

Inter-annual TAC constraint

A rule to restrict the inter-annual TAC variation to no more than 5% up or down from year to year is applied, i.e.

$$\begin{aligned} &\text{if } TAC_{y+1} > 1.05TAC_y && TAC_{y+1} = 1.05TAC_y \\ &\text{if } TAC_{y+1} < 0.95TAC_y && TAC_{y+1} = 0.95TAC_y \end{aligned} \quad (8)$$

Thus as $TAC_{2008} < 0.95TAC_{2007}$ i.e. 300.22 < 363, the final 363 MT.