

# Summary results for the effect of the time of tagging on the somatic growth of west coast rock lobster males

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## Introduction

A General Linear Model (GLM) has been used to investigate the possible effect that the time of tagging might have in the somatic growth of the west coast rock lobster. Data from the 1968/69 to 2004/05 seasons are used in the analyses.

## The data

The analyses presented in this paper were applied to records of growth rate of rock lobsters recaptured at Dassen Island, Knol and Olifantsbos. The following record exclusions were made as in Glazer and Butterworth (2002):

1. more than two appendages were recorded as missing at the time of tagging
2. growth exceeds 9.9 mm within a year
3. negative growth increments exceed 3% of the size at the time of tagging
4. release and recapture areas differ and are not adjacent
5. catch and release areas differ
6. lobsters are female
7. lobsters were at large for more than 365 days.

Growth rate information is available for the 68/69 season through to the 04/05 season. Growth rate records in the 04/05 season include those obtained by a separate experiment on tagging of rock lobsters. Application of the above exclusions resulted in 17 144 records (for the three locations under consideration combined) available for analysis.

The record exclusions above do not eliminate any lobsters that may not have moulted in the period between tagging and recapture. Two moult windows for removing the time-at-large effect were applied to the data for the analyses: a) 15 Oct to 30 Nov and b) 1 Oct to 31 Dec. Lobsters tagged after the first date indicated, or recaptured before the second date were excluded. These

exclusions resulted in a) 11 384 and b) 9 033 records being available.

## The General Linear Model

The GLM applied to the growth data for each location is of the form:

$$Incr = \mu + Y_i + M_t + \gamma * L + \varepsilon, \quad (1)$$

where :

- $Incr$  is the annual growth increment (mm),
- $\mu$  is the intercept (including the 2004/05 season and August for the month of tagging),
- $Y_i$  is the year (taken to be the recapture season defined as a split-year from 1 Oct to 30 Sep) effect,
- $M_t$  is the month of **tagging** effect,
- $\gamma$  is a constant,
- $L$  is the initial length (mm), and
- $\varepsilon$  is an error term assumed to be normally distributed.

## Results and conclusions

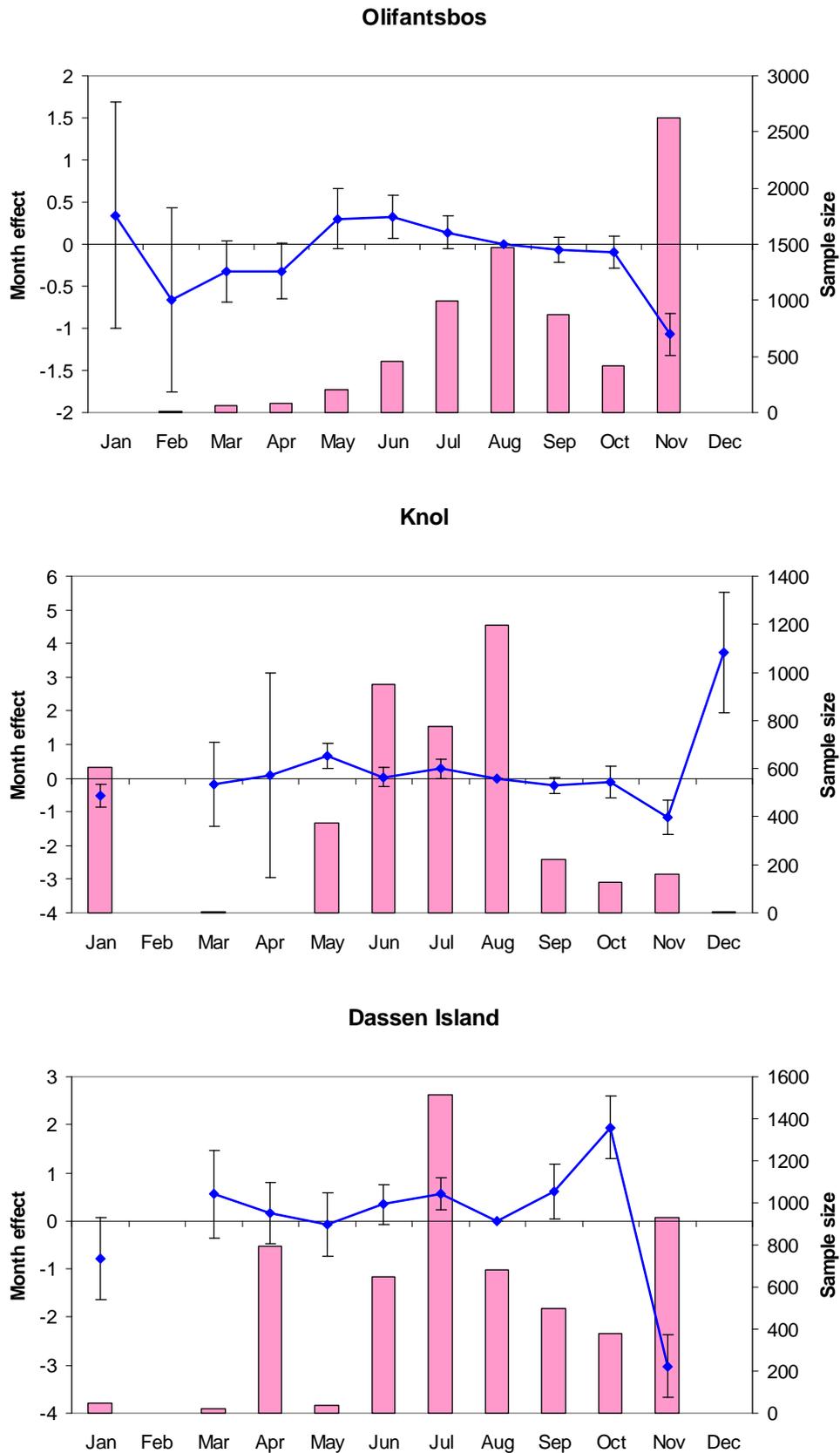
The month of tagging effect and associated 95% confidence intervals (relative to August) for the three locations when all data are considered are shown in Figure 1. The plots all show the sample size in each month that lobsters were tagged.

In all three locations the results obtained do not suggest that the time of tagging has any significant impact on the growth rate of rock lobsters. Although there is a significantly lower estimate for lobsters tagged in November, this presumably reflects cases where tagging took place after the moult had occurred.

The cases when various sizes of a moult window were applied to remove the time-at-large effect were also considered. Results however did not differ substantially from those presented in Figure 1.

## References

Glazer, J. and Butterworth, D.S. 2002. The male west coast rock lobster revised growth database. BENEFIT workshop Document: BEN/DEC02/WCRL/2.



**Figure 1.** Month of tagging effect (with 95% confidence intervals) for the Olifantsbos, Knol and Dassen Island locations when no moult window is taken into account. Sample sizes in each month that lobsters were tagged are also given.