



Comparison of sardine November proportion-at-age from different length frequencies and age readers

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Introduction

de Moor and Butterworth (2009) recommended that a new method to weight the trawls when calculating the sardine length frequency observed during the November surveys be applied. This new method involved weighting the individual trawls equally for all trawls of sample sizes greater than 40 and down weighting those of smaller sample size. The method used previously weighted the individual trawls by the acoustic weighting associated by that trawl as a proportion of the total acoustic weighting of all trawls.

This investigation was initially prompted in 2007 when considering the unusual lack of evidence for strong cohorts in length frequency data and the proportions-at-age which showed a higher proportion of older ages than implied by current estimates of natural mortality. This latter concern remained when the proportions-at-age were recently recalculated using ALKs provided by Deon Durholtz. The proportions-at-age are now compared using ALKs provided by Cynthia Mtengwane and the revised November length frequencies for sardine (Coetzee and Merkle 2011).

Results and Discussion

Figure 1 shows the proportion-at-age in the November survey using i) the 'old' length frequencies with Deon Durholtz's ALKs, ii) the 'old' length frequencies with Cynthia Mtengwane's ALKs, and iii) the 'new' length frequencies with Cynthia Mtengwane's ALKs for years in which ALKs were provided by both readers. It is clear that in years where there is a large difference between i) and iii), there is also a large difference between i) and ii). This suggests the difference in the proportions-at-age is primarily due to the ALKs (i.e differences between the two age readers) rather than to the length frequencies. However, differences particularly in the proportion-at-age 1 are still evident between ii) and iii). A continuous decrease in proportion from age 1 to 5+ is not evident in iii) in all years under Cynthia's readings, but there are indications that this is consistent with the progression of strong year-classes, eg the May 2001 recruits can be seen as 1 year olds in November 2001, 3 year olds in 2003 and 4 year olds in 2004.

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The primary reason for recommending the revised (downweighting) method for calculating the November survey length frequencies for sardine was due to the improved precision in estimates of the proportions-at-length and proportions-at-age (de Moor and Butterworth 2009). For this reason, the revised length frequencies are preferred over the 'old' ones.

References

- Coetzee, J. and Merkle, D. 2011. Revised method of weighting November sardine survey length frequencies. DAFF: Branch Fisheries Document FISHERIES/2011/SWG-PEL/24. 5pp
- de Moor, C.L., and Butterworth, D.S. 2009. How should the sardine length frequencies be weighted? Exploring alternative methods. Marine and Coastal Management Document MCM/2009/SWG-PEL/42. 23pp

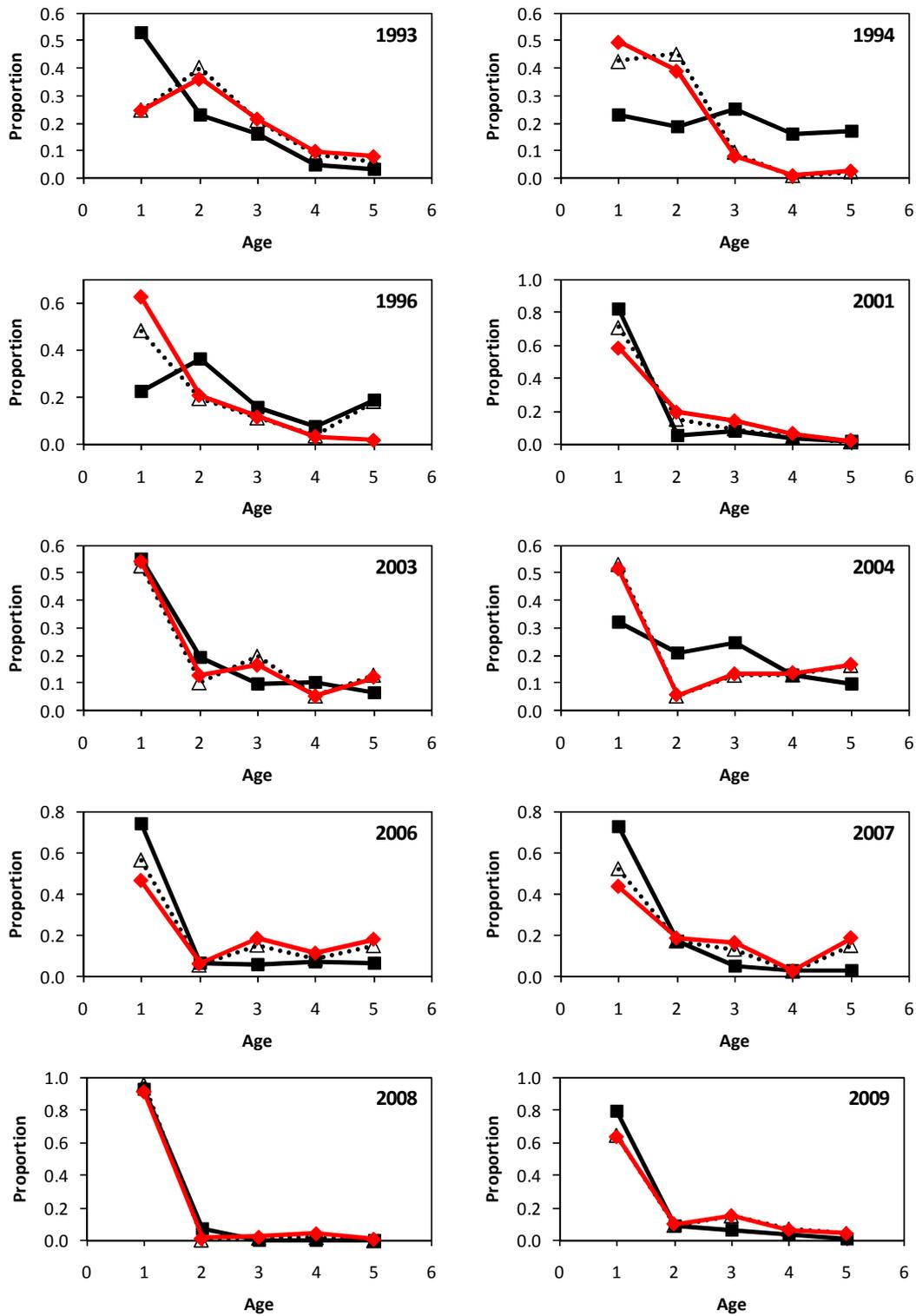


Figure 1. The proportions-at-ages 1 to 5+ in the November surveys using i) the ‘old’ length frequencies with Deon Durholtz’s ALKs (black solid squares), ii) the ‘old’ length frequencies with Cynthia Mtengwane’s ALKs (black dotted lines with open triangles), and iii) the ‘new’ length frequencies with Cynthia Mtengwane’s ALKs (red diamonds).