Standardised CPUE trends for *South Johnies* and for the combined *Johnies* and *South Johnies* aggregations

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Time constraints precluded an update of the delta-lognormal CPUE standardisation for the *South Johnies* region to be presented at the Orange Roughy Working Group held in Swakopmund in late February 2007. However, Brandão and Butterworth (2007) presented updated nominal CPUE indices, which showed a flattening followed by an upturn over the last two years, It is important however, to check whether this same pattern is still observed in the standardised CPUE series, which takes into account other factors that might affect the CPUE. This paper presents updated standardised CPUE indices of abundance for the *South Johnies* aggregations as well as for the "combined" *Johnies* aggregation that also includes this southern region.

Commercial tow information inside the known aggregations of orange roughy in Namibia as well as tow information in the region south of *Johnies* have been used in the GLM fitting procedure. The restrictions applied to the *South Johnies* aggregation data records used in the GLM analyses were different from those applied to the known sub-aggregations in Brandão and Butterworth (2007) to allow more limited data for recent years to be taken into account. Thus, in this instance, only seven (and not 20) or more records were required to be available within a fishing year in each of the 1° latitudinal bands of *South Johnies*. A total of 21 003 records was available for the analyses, of which 18 092 recorded a non-zero catch. The same GLM formulation as in Brandão and Butterworth (2006, 2007) were used to standardise the CPUE data for *South Johnies*. The "zero" method is applied for combining the results for the various sub-aggregations to provide a single index for the *South Johnies* aggregation as well as for the *Johnies* and the *South Johnies* aggregations combined.

Figure 1 shows the index of abundance provided by the delta-lognormal model assuming binomial errors for the proportion positive for the *South Johnies* aggregation. For comparison purposes, the nominal CPUE series obtained by Brandão and Butterworth (2007) is also shown. Although the standardised CPUE trend has dropped since the peak in 2002, the trend has

flattened since 2004 and there is an upturn in 2006, though not as large as for the nominal CPUE.

Figure 2 shows the index of abundance for the *Johnies* and *South Johnies* aggregations combined obtained from fitting the delta-lognormal model assuming binomial errors for the proportion positive. For comparison, the standardised CPUE series for the known *Johnies* aggregation as obtained by Brandão and Butterworth (2007) is also shown (referred to as Old *Johnies*). The drop in the 2006 value from 2005 is much reduced when combining the *Johnies* and *South Johnies* aggregations than when considering the *Johnies* aggregation on its own. In broad terms the combined *Johnies* standardised index suggests relative stability over the past decade, but this trend may be positively biased as the "zero" method assumes no contribution from some of the *South Johnies* strata in the earliest years when these were not fished.

Acknowledgements

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Reference

Brandão, A. and Butterworth, D.S. 2006. Updated investigation of the orange roughy south of *Johnies* given further data. Namibian Ministry of Fisheries and Marine Resources document: DWFWG/WkShop/Feb06/Doc 6.

Brandão, A. and Butterworth, D.S. 2007. CPUE trends for *South Johnies*. Namibian Ministry of Fisheries and Marine Resources document: DWFWG/WkShop/Feb07/Doc 3.

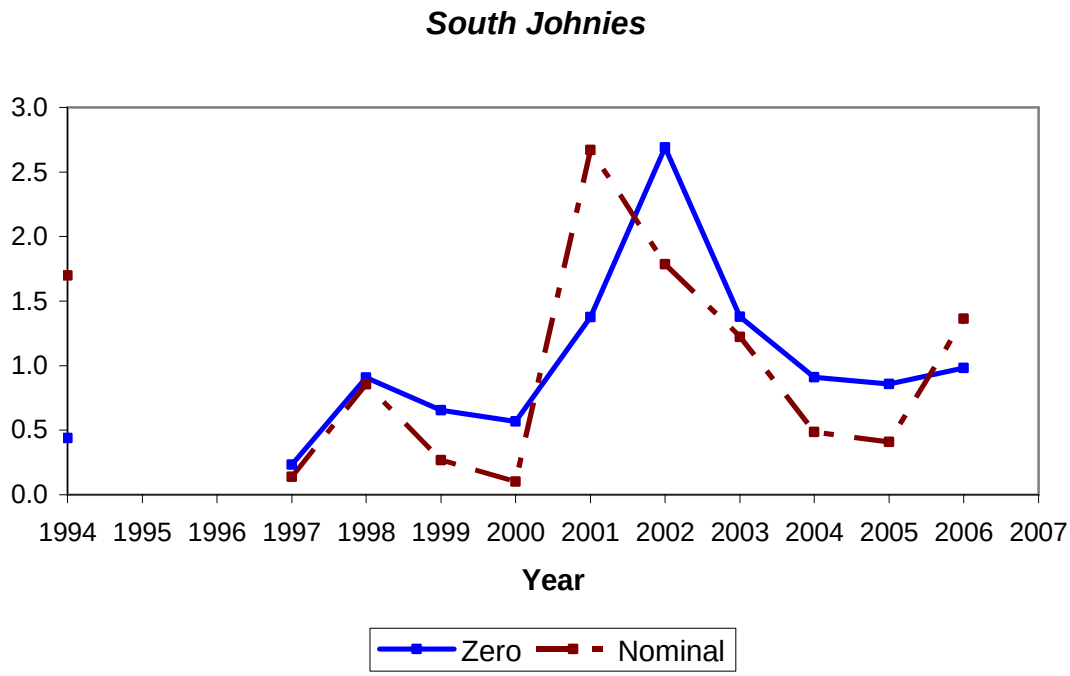

Figure 1. Index of abundance for the *South Johnies* aggregation (normalised to its mean over the thirteen year period) for Namibian orange roughy obtained from fitting the delta-lognormal model assuming binomial errors for the proportion positive. For comparison, the nominal CPUE series is also shown.

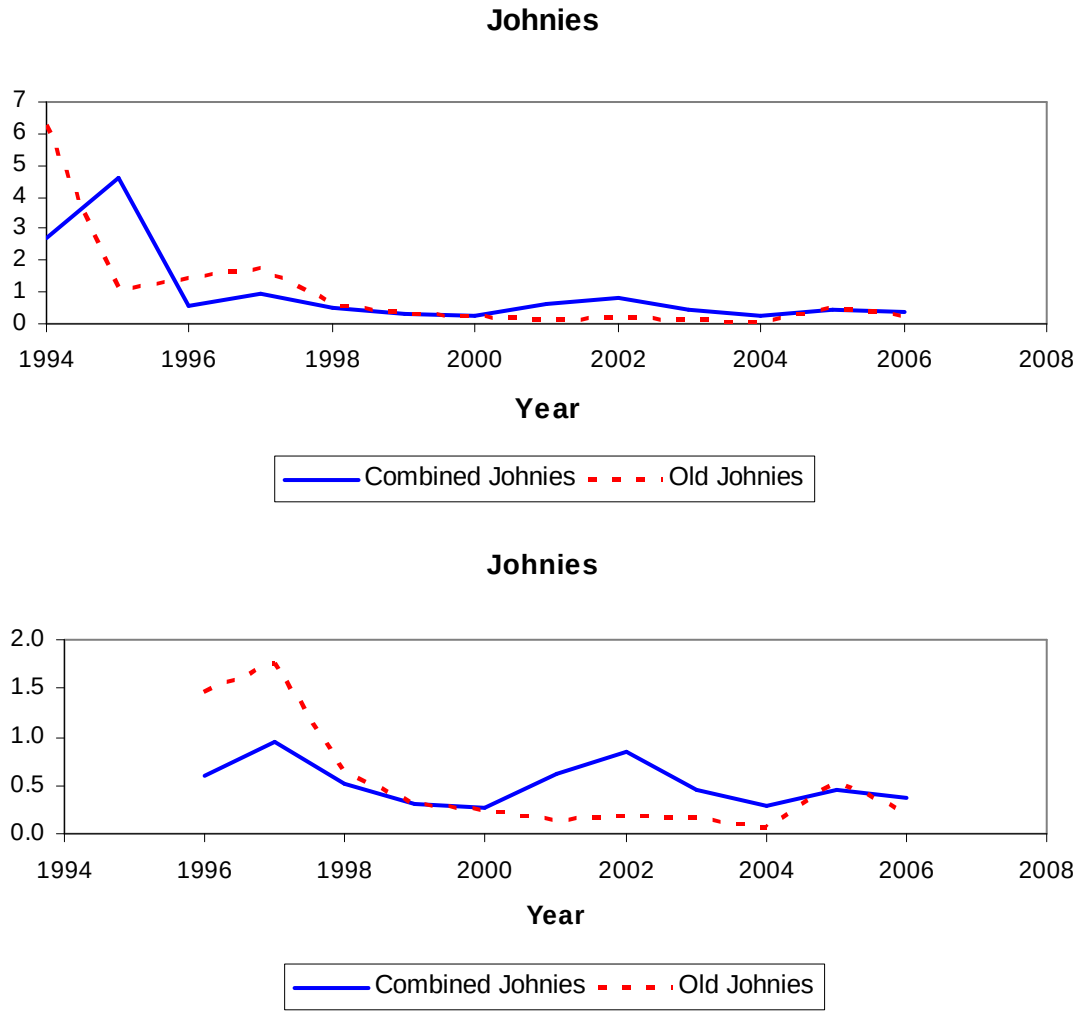

Figure 2. Index of abundance for the *Johnies* and *South Johnies* aggregations combined (normalised to its mean over the thirteen year period) for Namibian orange roughy obtained from fitting the delta-lognormal model assuming binomial errors for the proportion positive. Results are shown for the "zero" method of dealing with empty cells when combining the indices from sub-aggregations. For comparison, the standardised CPUE series for the known *Johnies* aggregation as obtained by Brandão and Butterworth (2007) is also shown (referred to as Old *Johnies*). For clarity, the bottom plot shows the same series but from 1996 onwards.