

Movement estimated by the alternative hypotheses of two mixing stocks of South African sardine

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Introduction

This document shows the proportions of west stock recruits (and older west stock fish under Alternative D (Varied Adult Movement)) estimated by the alternative hypotheses of de Moor et al. (2014) and projected by de Moor (2014). Four alternative hypotheses have been proposed, but results are currently only available for three:

- Alternative A (Effective Spawning Biomasses)
- Alternative B (Varied Recruit Distributions)
- Alternative D (Varied Adult Movement)

Results and Discussion

Alternative A (Effective Spawning Biomasses)

The proportion of west stock recruits estimated to move to the south stock is larger under the Alternative “A” hypotheses than the Baseline for 1999-2000 and 2004-2008, and lower for 2001-2003 (Figures 1 and 2), with the least difference being for A-1.

Alternative B (Varied Recruit Distributions)

There is little difference between the estimated proportion of west stock recruits that move to the south stock under the alternative “B” hypotheses (Figures 3 and 4). Thus even if 50% of the south stock recruits are surveyed west of Cape Infanta, the impact on the proportion of west stock recruits estimated to move to the south stock is not large.

Alternative D (Varied Adult Movement)

The alternative “D” hypotheses allow more west stock fish to move to the south stock, and thus one would expect the proportions of west stock recruits estimated to move would be lower than the Baseline (Figures 5 and 6). As fewer 1 year olds move under D-3 than D-1 the proportion moving is higher under D-3 than D-1. Similarly the proportion is higher under D-4 than D-2.

References

de Moor, C.L. 2014. Alternative hypotheses of two mixing stocks of South African sardine: Some projections assuming no future catch. MARAM International Stock Assessment Workshop Report No MARAM/IWS/DEC14/Sardine/P4. 28pp.

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de Moor, C.L., Butterworth, D.S., van der Lingen C.D., and Coetzee J.C. 2014. Alternative hypotheses of two mixing stocks of South African sardine: Initial testing. MARAM International Stock Assessment Workshop Report No MARAM/IWS/DEC14/Sardine/P2. 20pp.

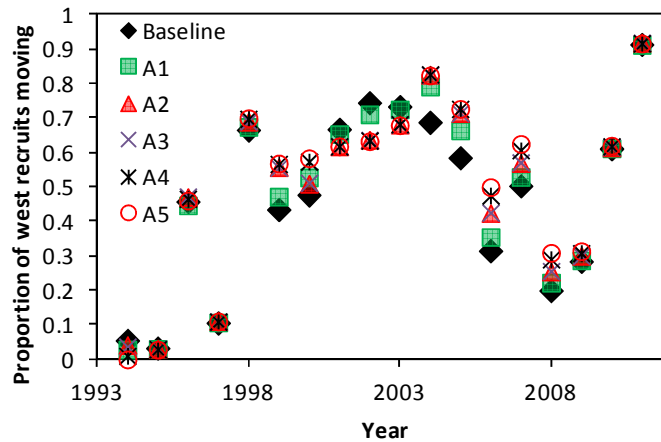


Figure 1. The estimated proportion of west stock recruits that move to the south stock each year from 1994 to 2011 for the alternative “A” hypotheses, at the joint posterior mode.

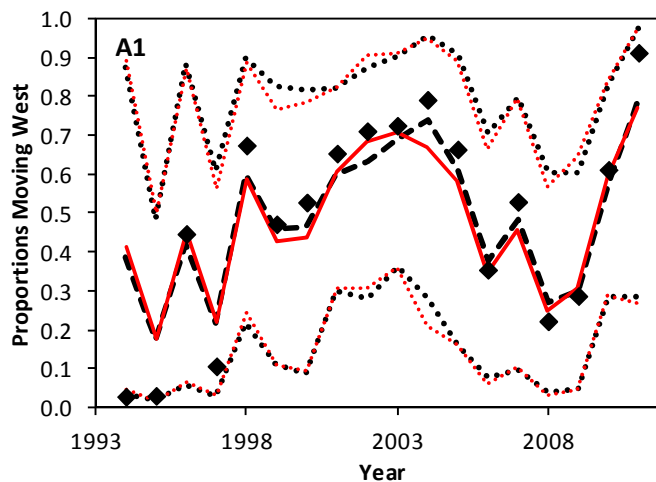


Figure 2. The posterior median and 90% probability intervals (dotted lines) of the proportion of west stock recruits estimated to move to the south stock each year from 1994 to 2011 for the alternative “A” hypotheses. The values at the joint posterior mode (Figure 1) are shown by the diamonds and the baseline distributions are shown in red.

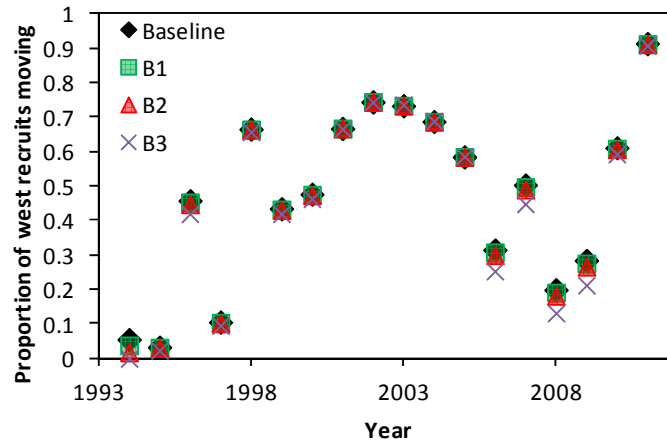


Figure 3. The estimated proportion of west stock recruits that move to the south stock each year from 1994 to 2011 for the alternative “B” hypotheses, at the joint posterior mode.

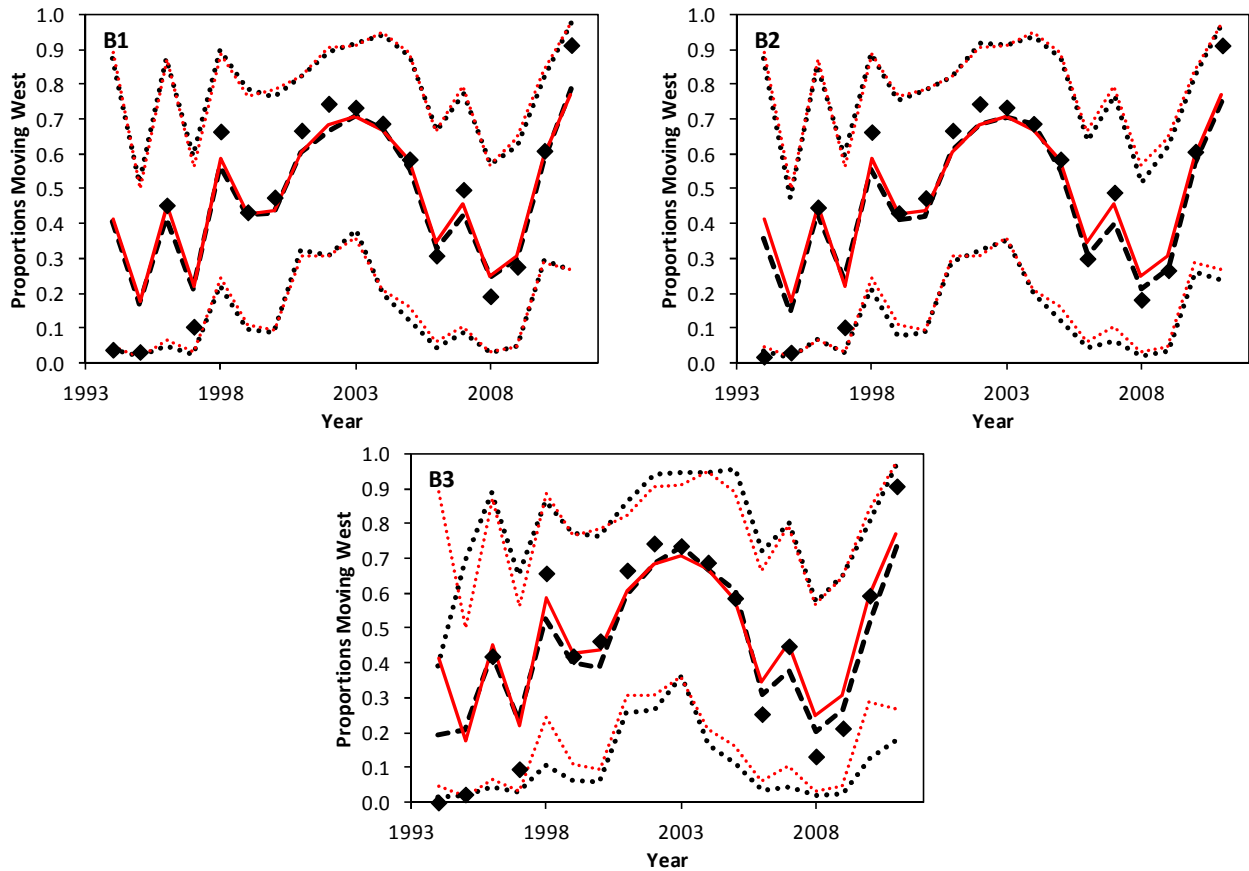


Figure 4. The posterior median and 90% probability intervals (dotted lines) of the proportion of west stock recruits estimated to move to the south stock each year from 1994 to 2011 for the alternative “B” hypotheses. The values at the joint posterior mode (Figure 3) are shown by the diamonds and the baseline distributions are shown in red.

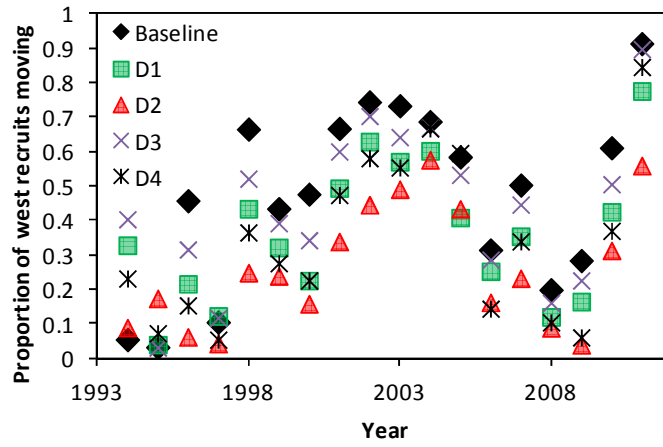


Figure 5. The estimated proportion of west stock recruits that move to the south stock each year from 1994 to 2011 for the alternative “D” hypotheses, at the joint posterior mode.

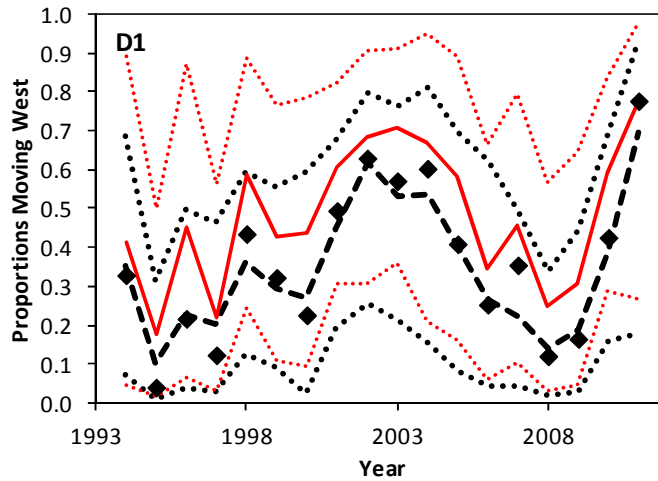


Figure 6. The posterior median and 90% probability intervals (dotted lines) of the proportion of west stock recruits estimated to move to the south stock each year from 1994 to 2011 for the alternative “D” hypotheses.