

Using the ratio of juvenile sardine : anchovy estimated by the June 2020 recruit survey to predict the 2020 sardine bycatch

C.L. de Moor*

Correspondence email: carryn.demoor@uct.ac.za

A regression by de Moor and Butterworth (2020) is used to suggest what small sardine bycatch could be realistically expected with an anchovy catch of 350 000t given the ratio of sardine : anchovy recruitment estimated by the June 2020 survey.

de Moor and Butterworth (2020) showed a relationship between the ratio of sardine to anchovy in the survey and that predicted by the assessment models (de Moor 2020a,b) at the time of the survey. There was a close to linear relationship in log space, with a slope of 0.69 when the survey ratio is based on recruit biomass and 0.99 when the survey ratio is based on recruit numbers.

The anchovy assessment model has been updated from that used when de Moor and Butterworth (2020) undertook their analysis (de Moor 2020c). Using this updated anchovy assessment, a close to linear relationship in log space is again achieved, with a slope of 0.73 when the survey ratio is based on recruit biomass and 1.04 when the survey ratio is based on recruit numbers.

The ratio of sardine : anchovy estimated by the June 2020 survey is 0.019 (ratio in number) or 0.038 (ratio in biomass) (Coetzee *et al.* 2020).

Using the relationship estimated by de Moor and Butterworth (2020) suggests the 'true' ratio of juvenile sardine : anchovy at the time of the survey was 0.018 (ratio in number) or 0.009 (ratio in biomass). If this ratio remains constant throughout the year (there is typically a drop-off in this ratio in the latter half of the year, de Moor (2018)), one could expect that an anchovy TAC of 350 000t would result in a small sardine bycatch of 6412t (ratio in number) or 3151t (ratio in biomass).

Using the relationship estimated with the updated anchovy assessment suggests the 'true' ratio of juvenile sardine : anchovy at the time of the survey was 0.022 (ratio in number) or 0.011 (ratio in biomass). If this ratio remains constant throughout the year, one could expect that an anchovy TAC of 350 000t would result in a small sardine bycatch of 7591t (ratio in number) or 3881t (ratio in biomass).

Note that there is variability in the relationships between the survey and model predicted sardine : anchovy recruitment at the time of the survey which has not been taken into account here.

References

Coetzee JC, Maliza L, Merkle D, Shabangu F, Peterson J, Jarvis G, Ntiyantiya D and Geja Y. 2020. Results of the 2020 pelagic recruitment survey. DFFE: Branch Fisheries Document FISHERIES/2020/JUL/SWG-PEL/56.

* MARAM (Marine Resource Assessment and Management Group), Department of Mathematics and Applied Mathematics, University of Cape Town, Rondebosch, 7701, South Africa.

- de Moor CL. 2018. Simulation testing framework used during OMP-18 development. DAFF Branch Fisheries Document FISHERIES/2018/SEP/SWG/PEL/27.
- de Moor CL. 2020a. The South African anchovy assessment with an informative prior distribution on the bias in hydro-acoustic survey estimates of abundance. DFFE: Branch Fisheries Document: FISHERIES/2020/JUN/SWG-PEL/40.
- de Moor CL. 2020b. Baseline assessment of the South African sardine resource using data from 1984-2019. DFFE: Branch Fisheries Document: FISHERIES/2020/APR/SWG-PEL/30.
- de Moor CL. 2020a. The South African anchovy assessment with annual maturity ogives. DFFE: Branch Fisheries Document: FISHERIES/2020/JUL/SWG-PEL/51.
- de Moor CL and Butterworth DS. 2020. Does the ratio of juvenile sardine : anchovy observed in the fishery and the recruit surveys correlate with that predicted by models? DFFE Branch Fisheries Document FISHERIES/2020/JUN/SWG-PEL/49.