

Alternative options for progressing towards TAC recommendations for 2022 with/out survey estimates of sardine and anchovy biomasses

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Three alternative outcomes from the small pelagic biomass survey in November 2021 are considered, and possible methods to progress with TAC/B recommendations for sardine and anchovy based on those outcomes are proposed.

Keywords: anchovy, hydro-acoustic survey, OMP-18rev, sardine, short-term projections

The annual November hydro-acoustic survey to estimate small pelagic survey biomasses has been severely delayed in 2021. It is no longer possible to obtain survey estimates of biomass comparable to previous years. Two partial survey options and one no survey option are considered with regard to how the associated abundance estimates of biomass (if any) could be used to recommend anchovy and sardine TACs and TABs for 2022.

Sardine: Incomplete survey coverage west of Cape Agulhas – survey does not extend further east

- The partial survey abundance estimate will be extrapolated to provide an estimate west of Cape Agulhas using the median of the annual proportions of the biomass surveyed in that area. The years over which that median would be calculated are still to be determined.
- To allow for the increased uncertainty arising from using this extrapolation compared to a 'true' survey estimate west of Cape Agulhas, the extrapolated survey estimate for that region will be reduced. It is suggested to use an appropriate lower %ile, but the value of that %ile is yet to be agreed.
- This lower %ile will be used as the November 2021 survey estimate west of Cape Agulhas in the assessment. The assessment will not be fit to November 2021 survey data (biomass or length frequency) east of Cape Agulhas.
- The survey length frequency will be assumed to be representative of the full area west of Cape Agulhas and used to fit the model.
- As it is quite possible (based on initial testing by de Moor (2021)) that this model will over-estimate the south component biomass in November 2021, there might be a need to consider the S_0^* model with higher weighting than the S_0 model for short-term projections.

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Sardine: Incomplete survey coverage west and east of Cape Agulhas

- The partial survey abundance estimates west and east of Cape Agulhas will be extrapolated to provide estimates for each of those regions using the median of the proportions from the annual biomass surveys in those areas. The years over which those medians would be calculated are still to be determined.
- To allow for the increased uncertainty arising from using this extrapolation compared to 'true' survey estimates west and east of Cape Agulhas, the extrapolated survey estimate west and east of Cape Agulhas will be reduced. It is suggested to use an appropriate lower %ile, but the value of those %ile are yet to be agreed.
- These lower %iles will be used as the November 2021 survey estimates west and east of Cape Agulhas in the assessment.
- The survey length frequencies west and east of Cape Agulhas will be assumed to be representative of the full areas west and east of Cape Agulhas, respectively, and used to fit the model.

Sardine: No survey

- The assessment will be fit without any November 2021 survey data (neither estimates of biomass or length frequencies).
- To allow for the resultant increased uncertainty in the estimation of the biomass and age-composition in November 2021, the assessment's best estimates of the November 2021 biomass, spawner biomass and numbers-at-age will be reduced prior to running short-term projections. The amount by which these are to be reduced is still to be determined.
- As it is quite possible that this model will over-estimate the south component biomass in November 2021, there might be a need to consider the S_0^* model with higher weighting than the S_0 model for short-term projections.

Anchovy: Incomplete survey coverage west and east of Cape Agulhas

- The partial survey estimate will be extrapolated to an estimate of the full survey area using the median proportions of the annual proportions of the biomass surveyed in those areas. The years over which those medians would be calculated are still to be determined.
- To allow for the increased uncertainty arising from using this extrapolation compared to a 'true' survey estimate of biomass, the extrapolated survey estimate will be reduced. It is suggested to use an appropriate lower %ile, but the value of that %ile is yet to be agreed.
- This lower %ile will be used as the November 2021 survey estimate in OMP-18rev.

Anchovy: No survey

- One option is to assume the November 2021 survey biomass estimate (for use in OMP-18rev) corresponds to a lower %ile of the anchovy survey biomass predicted for November 2021 during the

development of OMP-18rev. The code to calculate this is already available and the biomass could be extracted reasonably quickly.

- Another option is to update the anchovy assessment from November 2019 to 2021, but not fit to November 2021 data (as for the sardine assessment above). That assessment would provide an estimate of November 2021 survey biomass. While this is the more reliable of the two options, it would take more time to update both the time-series of data and the assessment.
- To allow for the increased uncertainty in the estimation of the biomass and age-composition in November 2021, the assessment's estimates of the November 2021 survey biomass will be reduced prior to being used in OMP-18rev. The amount of this reduction is still to be determined.

References

de Moor CL. 2021. Testing the sardine assessment for use at the end of 2021. DFFE: Branch Fisheries Document FISHERIES/2021/DEC/SWG-PEL/63.