A recommendation for the initial anchovy Total Allowable Catch for 2020

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A brief summary of some of the considerations noted by the SWG-PEL Task Group based on the short-term projections of de Moor (2020) to provide a recommended initial anchovy TAC for 2020.

This document provides a brief summary of some of the considerations noted to reach a SWG-PEL Task Group recommendation for the initial anchovy Total Allowable Catch (TAC). It is not exhaustive, but draws attention to some key considerations. These are based on the extensive results provided by the short-term projections of the anchovy resource under alternative constant catch scenarios (de Moor 2020). All tables and figures referred to are given in de Moor (2020).

Under the baseline model A_0 and sensitivity test A_1, the most recent 5 years of recruitment have averaged around 75% of the historical average over 1984-2018, while the most recent 2 years of recruitment have been around 50% of the historical average (Table 1). One should also consider the decreasing trend in recruitment in recent years which may mean that future recruitment could settle on a regime about lower historical averages (for example 50% of the most recent two years recruitment is between 20 and 30% of the historical average). The points below focus on the results assuming the plausible scenario that future recruitment will deviate about 50% of the historical average.

The anchovy fishery is primarily a recruit fishery, based on an incoming recruitment which is currently unknown. The initial TAC has always been "precautionary", assuming less than average recruitment would occur until information became available from the recruit survey. Two different methods were considered for being precautionary in the absence of knowledge on whether the incoming recruitment will be good, average or poor:

i) The 5%ile of some pertinent result(s) should be considered for the initial TAC.

ii) Less than the 50%ile, and perhaps the 20%ile of some pertinent result(s) should be considered to inform a TAC and the initial TAC should then be set at a proportion of that TAC. The proportion should be informed by the current HCR for OMP-18 which sets the initial TAC at 85% of that calculated under the assumption that recruitment will be the average of that estimated between 1984 and 1999, i.e. on average 75% of that estimated between 1984 and 2014 (de Moor 2018).

As I prefer the former, the below comments are based on the 5%iles with no subsequent adjustment of the TAC. Note that in Tables 2, 3 and 4, sections (a), (b) and (d) give percentiles of the distributions of the statistics of interest are given. This is the preferred method of calculating performance statistics. Sections (c) and (e) give the statistics of the percentiles of the distributions, for example what you would see in the figures of the 5%ile changing between scenarios.

For A_0:

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- The 1-year impact of catch on the population is to decrease the SSB to 89% (150 000t) or 85% (200 000t) of that which could be expected were there no catch during 2020 (Table 2a).
- The medium-term impact of the catch on the population is to decrease it to 80% (150 000t) or 73% (200 000t) of that which could be expected were there no future catch (Table 2b).
- When considering the shift in the distribution as a whole (rather than the individual trajectories as for Tables 2a,b), the impact of 1 year's catch on the population is to decrease it to 67% (150 000t) or 64% (200 000t) of that in 2019 (Table 2c). This decrease may initially seem severe, but understanding that under the assumption that future recruitment is assumed to vary about 50% of the historical average, it is natural to expect *some* decrease from 2019 (which would have some adults remaining from higher recruitment years). However, after 10 years the shift in the distributions results in a decrease to 79% (150 000t) or 72% (200 000t) of that which could be expected under a no future catch scenario (Table 2c). Given these are above 70% one could argue that either 150 000t or 200 000t would be compatible with sustainably harvested.
- The depletion of the resource at the end of 2020 will be 39% (150 000t) or 35% (200 000t) of the Dynamic B_0 in 2019, 45% (150 000t) or 43% (200 000t) of the projected Dynamic B_0 in 2020, with a medium term equilibrium of 45% (150 000t) or 41% (200 000t) (Table 2d). These depletion levels are concerning.
- When considering the shift in the distribution as a whole (rather than the individual trajectories as for Table 2d), the depletion of the resource at the end of 2020 will be 47% (150 000t) or 45% (200 000t) of the Dynamic B_0 in 2019, 68% (150 000t) or 65% (200 000t) of the projected Dynamic B_0 in 2020, with a medium term equilibrium of 79% (150 000t) or 72% (200 000t) (Table 2e).

For A_1:

- Considering the same statistics as those listed above for A_0 suggests a greater level of 'impact' under A_1 than under A_0 (Tables 3a-c). The greater impact/depletion is not, however, unacceptable, except for the case of 200 000t which reduces the population to 62% (Table 3b considering individual trajectories) or 57% (Table 3c considering distributions) of that in 2019. These are below 70%, a threshold often considered for small pelagics. The difference in the distributions after 10 years is 61% between catch and no catch scenarios (Table 3c). The depletion under A_1 is 11-19% more than that of the low values reported above for A_0 (for individual trajectories - Table 3d) and 10-12% when considering the shift in the distributions (Table 3e).

For A_8:

- Under A_8, the most recent recruitment would have been above 100% of the historical average (Table 1). The Task Group therefore focused on the results of A_8 assuming future recruitment will deviate about the historical average.
- Considering the same statistics as those listed above for A_0 suggests 150 000t and 200 000t would be acceptable (the impact of one year's catch on the population is to decrease it to 51% (150 000t) or 48% (200 000t) of that in 2019, but after 10 years the distribution under catch is 81% (150 000t) or 74% (200 000t) of that under a no future catch scenario (Table 4c).

References

de Moor CL. 2018. The 2018 Operational Management Procedure for the South African sardine and anchovy resources. DAFF: Branch Fisheries Document FISHERIES/2018/DEC/SWG-PEL/37.

de Moor CL. 2020. Short-term projections of the South African anchovy resource using constant catch scenarios. DEA: Branch Fisheries Document FISHERIES/2020/MAR/SWG-PEL/16.