EXPERT WORKING GROUP on: "Data gaps and Biomass Escapement Strategy for Adriatic anchovy and sardine" Venue: EC JRC Ispra (VA), Italy Dates: 26/02 – 02/03 2018

Background: STECF PLEN 17-03, evaluating possible reference points for Adriatic small pelagics and pondering alternative management strategies, has identified a Biomass escapement strategy as a viable approach that could allow higher catches while maintaining similar risks of a traditions Fmsy based strategy. The terms of reference include: "For anchovy and sardine in the Adriatic Sea (GSA 17+18) develop a biomass escapement Harvest Control Rule (HCR) that will ensure a low probability of SSB to fall below Blim (5% probability). The HCR should be tested in a Management Strategy Evaluation and the HCR needs to be robust to different assumptions on recruitment, assessment model, to misspecification of age 0 maturity, M and age. The EWG is requested to undertake MSE simulations commencing in January 2021."

Main conclusions

- Available data and stock assessment would allow the implementation of the B escapement strategy;
- Estimates for the model of stock evaluation are optimistic because the low recruitment, mainly due to low biomass level, has not considered. Other models should be applied;
- Set of parameters has been selected and tested as candidates to parameterize the HCR. The short-term projections should be improved. The results seem to be robust considering the modification of the natural mortality and maturity. While the outcomes are not robust in relation to the stock assessment uncertainty, that can deteriorate the biological risk to the level above the 5%.

- Input data: Different methods have been identified in order to improve in time the window to provide the input data for assessment (survey and catch at age) and to increase precision in the definition of fishing opportunities for both species.

- Survey periods: Two surveys per year are the best solution, the first in the period of sardine recruitment and anchovy spawning, and the second one in the anchovy recruitment and sardine spawning. The most important survey concerns recruitment. In the Larnaka meeting in 2017 DG MARE and JRC asked to MS scientific institutes shorter time for returning the survey results. Italian side agreed, while the Croatian one stated that the current conditions cannot allow to implement the timing required by the B escapement strategy.

- Mixed fisheries: the interested fisheries have a component of mixed fisheries, although the analysis and data provided by the MS shown that a hard choke species effect if not likely: the chair opinion is that the fisherman can choose which species is catching. The proportion between the two species is relevant because the cap of TAC could be achieved for one species before the other.

- The **economic analysis** of HCR different scenarios hasn't been possible because the temporal series of the available data didn't allow the achievement of results consistent enough. The evaluation of the maximum economic performance of HCR considered the Annual Economic Report (AER) data. Various combined options between catches/F and variable costs (fuel and/or other variable costs) have been evaluated, while no correlation has been identified.

The last outputs obtained by the simulation, assuming status quo catches in 2017 and 2018, in the short term **crash the anchovies stock**. Recruitment constantly decreased in the last years and catches in 2016 confirm this reduction. This result is based on the catches estimate agreed during the first day of the meeting at 33.000 tons for 2017. **Although the EWG shouldn't concern the short-term effects, the chair suggests arranging a meeting between MARE, STECF and MEDAC in order to understand the assessment modifications related to the values estimates needed for the intermediate period** (2017-2018-2019-2020). The crash of the anchovies' stock seems to be mainly due to the low recruitment levels in 2016. Therefore, the estimated catches at 33.000 tons and possible quantities modifications shouldn't modify the results.

The chair reminds that the short-term simulations obtained during this EWG should be based on the re-assessment of stock values of previous stock assessment meetings (SSB, etc) in order to have more robust results. In view of the MARE and MEDAC involvement in sharing the information on the crash of anchovies' stock, assumptions and the parameters selection need to be verified. Moreover, information on 2017 catches, more detailed and reliable data are required to understand the severity of the issue.

Sardine seems to be not affected by the same crash because the recruitment biomass never felt under same critical reduction till now.

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