

Mr Joao AGUIAR MACHADO

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Date: 25 July 2019
Our reference: 1819/PAC82
Subject: Update Pelagic AC work on additional blue whiting evaluations as input to ICES for WGWIDE

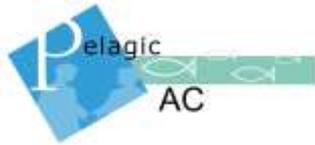
Dear Mr. Aguiar Machado,

With this letter, the Pelagic Advisory Council would like to update you on ongoing work with regard to the development of a management strategy for the blue whiting stock. We expect to make significant progress over the coming weeks and to formulate a recommendation on this in the second half of August. The Pelagic AC would highly appreciate it if the Commission could submit a Pelagic AC contribution on blue whiting to ICES ahead of the WGWIDE meeting. Given the tight timelines and summer holidays, we wish to inform you of this ongoing work in advance in the hope you are in a position to speed up the submission to ICES as soon as it is ready. This request has unanimously been endorsed by the Executive Committee.

The Pelagic AC blue whiting Focus Group met on 26 April 2019 to discuss the current status of the stock. Blue whiting is a stock subject to strong fluctuations in recruitment. Preliminary analysis indicates that the ICES standard MSY rule is not precautionary at low recruitment, creating problems for management. In addition, the latest (2018) ICES advice indicates a low recruitment phase is expected, and predicts a stock decline from 2020 when 2016 and 2017 year classes are fully selected in the fishery.

There was consensus among the Focus Group to move forward with the development of a two-tier management strategy for blue whiting. To support this work, a TOR for an external scientific consultant has been produced, to try and evaluate a two-tier assessment in hindcasting fashion. The work is expected to give insights on what a two-tier management approach would have looked like in the past, and form a basis from which the future behavior of a two-tier based management strategy could be simulated. Please find more details of the TOR in the Annex.





The work is currently ongoing and is expected to be delivered by the end of August, in any case before WGWIDE. A technical meeting will be held early August to discuss the preliminary outcomes and finalise the report before submission to the European Commission. The Pelagic AC would be very grateful if, upon receipt, the Commission could submit this contribution to ICES for inclusion on the agenda of the ICES WGWIDE meeting held on 28 August - 3 September 2019.

Thanking you in advance for your consideration of the above.

Kind regards,

A handwritten signature in blue ink that reads 'Jesper Raakjær'.

Jesper Raakjær
Chairman Pelagic AC



Annex

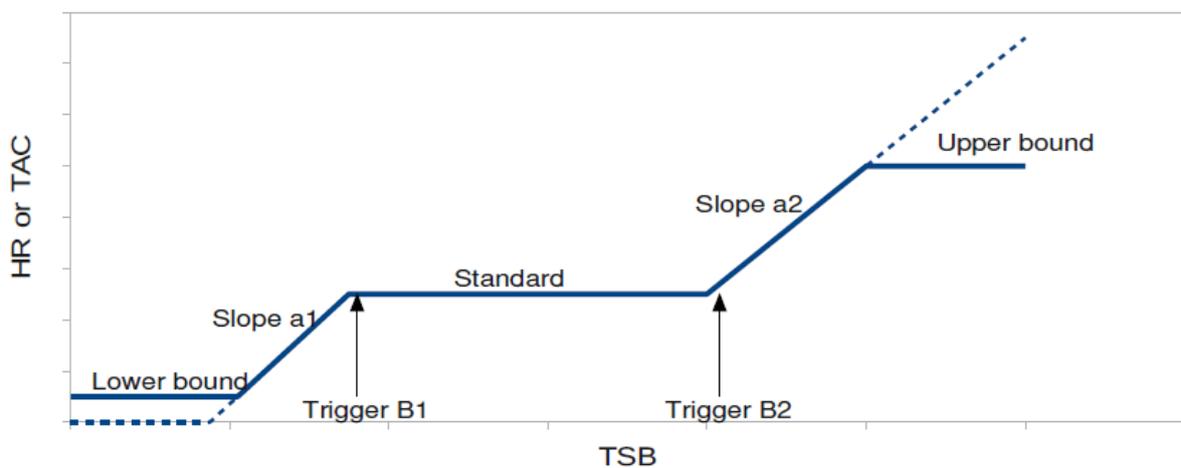
PELAC Terms of Reference for additional evaluations of blue whiting management

July 2019

Martin Pastoors, 3/6/2019

Background

The Pelagic Advisory Council (PELAC) has had a long involvement in the development of harvest control rules for the blue whiting stocks. Managing the blue whiting stock has two major challenges: 1) shifts between quite different recruitment regimes, and 2) unstable assessments because of strong year-to-year variations in survey results. Dankert Skagen developed and evaluated, at the request of the PELAC, different ways of handling the blue whiting stock (Skagen, 2012a; Skagen, 2012b). A noticeable outcome of the work Dankert Skagen was the presentation of a two-stage HCR which would exploit the stock at different levels depending on the productivity.



After some additional work in 2013 (Skagen and Miller, 2013), ICES issued two pieces of advice on the blue whiting HCR (ICES, 2013a; ICES, 2013b), concluding that “The proposed multistage HCRs are shown to meet the ICES precautionary requirement of less than 5% probability of $SSB < B_{lim}$ for the recruitment regimes simulated over a 40-year period”. Despite this advice, a two-stage HCR was not implemented in the management of the stock.

A further evaluation and advice in 2016 (ICES, 2016) focussed exclusively on a single-stage HCR and recommended updated parameters for F_{msy} and $MSY_{Btrigger}$.

However, despite these efforts, it has not been possible to implement a management plan with all coastal states involved and the recommended catch levels by ICES have been exceeded in most years.

In recent years the catches have been high as a result of strong incoming recruitment while in the most recent years, recruitment seems to be low again, probably leading to a period of substantially lower catches. The

PELAC is concerned about the strong upwards and downwards revisions of TACs or catches for this stock. To evaluate what would have been the consequences of the potential implementation of a sustainable management approach, the PELAC would like to see a hindcasting exercise, by 'replaying' the observed recruitments and evaluating the yields following different types of HCR.

Terms of Reference

1. Carry out a hindcasting analysis of different potential harvest control rules that could have been applied to the blue whiting stock:
 - a. Standard ICES MSY rule using an $F_{msy} = 0.32$ and MSY Btrigger of 2250000 tonnes
 - b. Two-tier approach as evaluated by Dankert Skagen (2012) and advised upon by ICES (ACOM 2013, section 9.3.3.7) using the following parameters:
 - i. A lower bound of $F = 0.05$ below $B_{lim} = 1\,500\,000$ tonnes;
 - ii. A linear sliding scale with slope $a_1 = 2.0$ starting at B_{lim} and ending at Trigger B1 = 2 250 000 tonnes;
 - iii. A standard level between Trigger B1 and Trigger B2 at $F_{0.1} = 0.22$;
 - iv. A linear sliding scale with slope $a_2 = 2.0$ above Trigger B2, where Trigger B2 is 4 000 000 tonnes; and
 - v. An upper bound at higher stock sizes at $F_{msy} = 0.32$.
 - c. Both scenarios are to be executed with and without a stability mechanism of 20% down and 25% up when the stock is above B_{lim} . If the stock would be below B_{lim} , no stability mechanism would be used.

Conditions:

- The analysis would need to be based on the starting population in a certain year (e.g. 2000) and the observed recruitments, both taken from the most recent assessment (ICES, 2018).
- Uncertainty in starting positions and recruitments needs to be generated from the SAM variance-covariance matrix using an appropriate number of replicates. If required, historical assessment errors may be used to scale the observed uncertainty from the assessment.
- The generated median recruitment pattern needs to be close the assessment results.
- Present diagnostics of model outcomes as:
 - Median total catch over whole time period
 - Median interannual variability over whole time period
 - Median stock size by year (and variability)
 - Median recruitment by year (and variability)
 - Median catch by year (and variability)
 - The number of years when the stability mechanism was applied
 - The median Inter-Annual Variability per iteration
- Work to be reported and presented in draft report by mid August 2019, final report prior to 26 August 2019.
- Code to be well documented and publicly available (github)

References:

ICES. 2013a. NEAFC request to ICES to evaluate the extra harvest control rule options for the long-term management plan for blue whiting. ICES Advice 2013, section 9.3.3.7, special request.

- ICES. 2013b. NEAFC request to ICES to evaluate the harvest control rule element of the long-term management plan for blue whiting. ICES Advice 2013, section 9.3.3.1, special request.
- ICES. 2016. NEAFC request to ICES to evaluate a long-term management strategy for the fisheries on the blue whiting (*Micromesistius poutassou*) stock. ICES Advice 2016, section 9.4.2, special request.
- ICES. 2018. Report of the Working Group on Widely Distributed Stocks (WGWIDE), 28 August - 3 September 2018, Torshavn, Faroe Islands. ICES C.M. 2018 / ACOM:23.
- Skagen, D. W. 2012a. Harvest control rules for Blue whiting. Report for Pelagic RAC
- Skagen, D. W. 2012b. Supplement to the Report for Pelagic RAC on Harvest control rules for Blue whiting.
- Skagen, D. W., and Miller, D. C. M. 2013. Blue Whiting HCR Evaluations, summer/autumn 2013. ICES C.M. 2013/ACOM:76.

