Meeting of Advisory Councils and ICES: January 2024

Written Responses from ICES are shown in blue below.

Stock assessment:

A1 NWWAC and SWWAC - Application of the precautionary approach

ICES is requested to provide advice on these stocks in the MoUs and Grant agreements. In the absence of sufficient data ICES applies its precautionary framework. ICES would encourage the collection of data to support the assessment and management of DLS stocks. Collaboration with National Scientific institutes and coordination through the RCGs of the DCF is needed. ICES has also worked on methodologies to allow for non-traditional data (WKENSURE, WKDSG, WKSHOES and the Data Profiling Tool). Guidance has been developed to support the integration of an increasing number of data and information contributions by third parties into ICES processed. WKLIFE is also currently working to try to come up with different methods for these types of stocks.

- A2 NWWAC and SWWAC - Avoidance of unwanted catches in stock assessments

Many of the ICES assessment include scientific estimates of unwanted catches, such as information on catch at age and length frequencies of catches. The assessment models usually allow for changing selectivity patterns in the fishery and this is informed by data (survey and catch data). So most assessment models can estimate improved fisheries selection and this is taken into account in the assessment and subsequent forecast.

- A3 PelAC - Boarfish

The boarfish benchmark is ongoing and without pre-empting the results of the benchmark process if the assessment move to category 1 then the advice cycle may be updated to annual subject to agreement of requesters. If it fails to reach Category 1 WKLIFE methods would be considered. Note that most (except SPiCT) are for 2 year advice and have been tested for bi-annual application and should not be used for annual advice without bespoke testing according to the developers.

- A4 PelAC - Herring in areas 6a North and 6a South 7bc

A benchmark would be needed but discussing at HAWG would be important for BenchMark Prioritisation

A5 BSAC - Herring and cod stocks in the Baltic

ICES is relying on sampling and monitoring data from member states to assess the levels of unavoidable bycatch.

Ecosystem based approach and mixed fisheries considerations
A6 BSAC - Progress of the work on mixed fisheries advice in the Baltic Sea for Pelagic and Demersal fisheries

Progress was made this year in WGMIXFISH. If this work continues mixed fisheries scenarios can be implemented in 1-2 years.

- <u>A7 PelAC</u> - ICES training opportunities on Ecosystem approach fisheries management

This is a matter for DG MARE but some previous ICES training courses funded by DGMARE were open to stakeholders.

<u>BSAC</u> - Questions on ecosystem considerations in stocks advice of the Baltic
1. Last year, the BSAC had asked this question (how to account for seal and parasite mortality in the advice) and ICES answered that work was ongoing[1]. Is there any update to this?
   DTU Aqua has applied for a EMFAF project on natural mortality conducted by seals, cormorants, and parasites and how this can be incorporated in the stock assessment. Funding decision will be made in about 1 month.

2. What efforts are made to better estimate the natural mortality levels due to impact of predators such as seals and cormorants (on the cod stocks) or prey availability (such as *Mysis relicta* for Bothnian herring)?
   A pilot study was carried out by DTU in 2022 in the Western Baltic, where a large group of cod has been tagged with PIT-tags to investigate the magnitude of predation from cormorants. The preliminary results have shown a high predation rate (> 25 %). Estimations on the total number of juvenile cod eaten by cormorants in the Western Baltic also show very high predation rates. However, these numbers should be further evaluated by including data from many colonies, as recent German studies have shown very large difference between cormorant colonies in their dependence on cod in the diet (0 to 80%). DTU Aqua is likely going to continue the investigations in coming years.

   In the Bothnian Sea, northern SD 29 and northern half of SD 32, monitoring of Mysis abundance was started in each BIAS survey haul at index (0–4) level, 2022 as the first year. Mysids have regularly been seen among the fish in the catches, and earlier observations from surveys in the Bothnian Sea (BIAS) suggest that there is a relationship between the abundance of mysids in the catches and the condition and possibly growth rate of larger herring. In addition, the first try to observe mysids with acoustic equipment was tried in 2023.

3. The TABACOD project results[2] have shown new information on the actual growth rate of cod. The eastern cod has a very low growth rate, and in some cases, there was no growth at all. Why did ICES not take into account these important growth rate/age results in the cod stock assessment?
   From the latest benchmark report it appears that the reduced growth is incorporated into the assessment:

   Growth information
   Annual age- length-keys (ALK) are used in the assessment model from 1991 onwards to inform the estimated yearly deviations in Von Bertalanffy growth parameters. The ALKs are based on age readings from BITS surveys, available in DATRAS. Both the ALKs from Q1 and Q4 are included.

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[1] For seals: *Work is ongoing on updating data on seal stomach content assessing the effect on cod biomass, ICES experts are working on models and collecting new evidence to further quantify the importance of cod in seal diet.*
Parasites in cod: *Parasite infestation of cod is also a driver of natural mortality. It is however unclear if it is a cause or an effect of poor condition of cod. Science is investigating these complex issues (eutrophication, climate change, O2 and seal abundance) and it is impossible to quantify the ecological effects.*
[2] https://orbit.dtu.dk/en/publications/tagging-baltic-cod-tabacod-eastern-baltic-cod-solving-the-ageing-

Age information from otolith age readings is considered uncertain, especially for later years. Nevertheless, WKBALTCOD2 (2019) concluded the ALKs used to provide a reasonable proxy for estimating changes in growth for the following reasons:

i)   The estimated change in growth is in line with expected changes in growth due to observed changes in biology of the stock and environmental conditions, as well as with preliminary growth information from a recent tagging program.

ii)   It is recognized that the exact values for Von Bertalanffy growth parameters estimated in the stock assessment are uncertain due to imprecise age information. This is affecting also natural mortality estimates, as growth and M are confounded. However, the results of the stock assessment in terms of stock status were found to be robust to the uncertainties associated with separating between M and growth (see ICES WKBALTCOD2 2019 for further details).

For these reasons, the ALKs presently used in the stock assessment are considered to provide a reasonable proxy for informing growth changes for stock assessment purposes. This is considered a temporary solution, until an alternative method for estimating growth becomes available (e.g. otolith microchemistry).

4. How is ICES explaining why cod is getting shorter and thinner? Is it related to a problem of an increase of selective fishing? Do you think that from a genetic point of view such fish should be kept in the stock or should be harvested?
The reason for fish in becoming thinner is not due to selective fishing but due to lack of food, oxygen depletion and parasites. A recent unpublished study by DTU Aqua shows that cod with high infection load cannot gain weight (or increase condition factor), even with unlimited access to food.

The directed fishing on cod has been prohibited for many years in the eastern Baltic area and it would be expected that this trend (with thin cod) would reverse if it was caused by selective fishing when no directed fishing is ongoing.

5. In the small pelagic fisheries, selective fishing with minimum mesh sizes leads to the structure of the catches not reflecting the structure of the harvested stock. In addition, for these fisheries, changing size selectivity by increasing mesh size may be detrimental, due to potentially higher hidden underwater mortality. In light of this, does ICES think that minimum mesh size for the species should be applied?
ICES would like to reiterate the conclusions of WKHERBAL that the basis for gear related technical measures for size selection in fisheries for small pelagic species are weak due to apparent high rates of post escape mortality, and that it was probably not a high priority to explore this further unless a more detailed review of the role of technical measures in fisheries for small pelagic species is available. This review is particularly important as the potential effects of this source of unaccounted mortality is largely unknown but may be substantial.

Regarding the current question from BSAC about whether minimum sizes for herring should at all be applied, ICES considers that before any firm conclusion about the pros and cons of size selectivity though mesh size