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Recommendation to encourage a trial fishery in the Baltic for stickleback

Background

The BSAC held discussions on stickleback in the framework of the BSAC Joint Working Group (9th–10th June 2020), BSAC Ecosystem Based Management Working Group (21st–22nd September 2020), the Executive Committee on 27th October 2020, and the BSAC Pelagic Working Group on 7th December 2020. A lot of supporting documentation on stickleback was provided¹. Scientists invited to the Ecosystem Based Management Working Group informed that stickleback is widely distributed in the Baltic, and that numbers are on the increase.²

The Pelagic Working Group discussed how to approach a stickleback fishery in a controlled and responsible manner and how to develop **guidelines for a trial fishery**, describing the background of the problem (including ecosystem considerations), and including the implications of this fishery in terms of by-catch, relevant changes needed in the technical measures, and criteria for data collection and handling of the catch.

The Working Group decided to recommend to the Executive Committee to encourage the trial fishery for stickleback and to look forward to the results.

The BSAC Executive Committee adopted this recommendation at its meeting on Friday 29th January 2021.

Background to the problem

Ulvi Päädam, Ministry of Environment, Estonia, presented the study on stickleback carried out in Estonia in 2017.³ She informed that stickleback is widely distributed in the Baltic. It hatches in coastal waters, and migrates to the open sea.

Jens Olsson, PhD, Institute for Aquatic Resources, Swedish University of Agricultural Sciences⁴ presented the latest information available on stickleback, including recent trends in population development and its role in the foodweb of the ecosystem.

¹ Link to two meetings for documentation: [BSAC - BSAC Pelagic Working Group](#); [BSAC - BSAC Ecosystem Based Management Working Group](#)

² See presentations made by Ulvi Päädam and Jens Olsson at Ecosystem Based Management WG.

³ http://www.bsac.dk/getattachment/Meetings/BSAC-meetings/Ecosystem-based-working-group/stickleback_UlviP.pdf.aspx?lang=en-GB

⁴ <http://www.bsac.dk/getattachment/Meetings/BSAC-meetings/Ecosystem-based-working-group/Olsson-presentation-BSAC-20200921.pdf.aspx?lang=en-GB>

Research on stickleback carried out in Finland⁵, under the national fisheries development programme, documents the spread of stickleback and its distribution in the water column. A fishery should take place away from the shore and during the daytime.

The report: A spatial regime shift from predator to prey dominance in a large coastal ecosystem, (Eklöf et al 2020)⁶ describes the development in Baltic fish stocks from the large predator fish such as cod, pike and perch to now being dominated by prey fish, in particular sprat, herring and stickleback.

Finland

Latest research carried out in Finland⁷, mentioned above, gives the latest information on pelagic fish species in the northern part of the Baltic. Sprat, herring and stickleback are the dominant species and comprise over 99% of total catches in the Gulf of Finland, the northern part of the Baltic and the Bothnian Sea. Sprat and herring are competing for food, sprat being a tough competitor. The dominant species during the daytime is stickleback, and for that reason there is no overlap in size class between herring and stickleback.

Fisheries representatives confirm the reports by scientists of increasing amounts of stickleback in the Baltic.

Sweden has recorded the following: stickleback bycatches in the Swedish pelagic trawl fishery (in the regular pelagic trawl fishery with 16 mm or 32 mm mesh) of to 564 tonnes in 2019 and 806 tonnes (early December) in 2020.

Lithuania has provided data from November 2020, mostly fishing in subdivision 28 or the central Baltic with pelagic trawls using sprat and herring codends:

Date	Total amount of fish	of which stickleback
14 November 2020	500 tonnes	50 kg
10 November 2020	300 tonnes	90 kg
3 November 2020	360 tonnes	294 kg

Denmark has recorded the following⁸:

Stickleback bycatches of 272 tonnes in 2019 and 507 tonnes (late December) in 2020.

⁵ <https://www.luke.fi/sv/nyheter/bestand-tillstand-och-tathet-nya-forskningsron-om-stromming-och-vassbuk-i-ostersjon/>

⁶ <https://www.nature.com/articles/s42003-020-01180-0>

⁷ <https://www.luke.fi/sv/nyheter/bestand-tillstand-och-tathet-nya-forskningsron-om-stromming-och-vassbuk-i-ostersjon/>

⁸ From the Danish Directorate of Fisheries

https://dwp.fiskeristyrelsen.dk/landingsrapport/landingsrapport_front_matter

Guidelines for a trial fishery

The BSAC recognises and encourages the development of a precautionary, monitored trial fishery for stickleback in order to collect and evaluate data and elaborate the optimal gear and mesh size. The trials should be planned to the widest possible extent in co-operation between fishermen and scientists.

The BSAC is aware of the potential risks of a fishery targeting a species which has so far not been exploited in a commercial fishery, and for which there is no stock assessment and no full bycatch data.

If possible, scientific observers should participate in the trials. The targeted stickleback fishery could be further developed together with scientific advice.

ICES should be asked to deliver scientific advice on this fishery.

Ecosystem considerations

All impacts of the stickleback fishery on the ecosystem should be taken into consideration, and recorded and documented. Risks to the ecosystem include:

- Bycatch of other species in the stickleback fishery (including the risk of bycatch of post-smolt salmon)
- Effect of a targeted fishery on the stickleback population
- Stickleback could also have a negative impact on the ecosystem and other species such as pike and pikeperch, by feeding on their larvae.
- Stickleback could be a threat to the cod and herring stocks in the Baltic by eating herring eggs and larvae in the herring spawning grounds. Interspecies relations should be investigated.

Technical measures regulation

Relevant articles and recommended changes to technical measures

Article 25 of the Technical Measures Regulation 2019/1241⁹ [Chapter IV] states the conditions for conducting scientific research.

Provided the conditions in the Article are met, derogations from the provisions of the technical measures regulation are possible in order to carry out scientific research with a limited number of vessels.

One important derogation relates to Article 27 [Chapter V] Conditions in relation to mesh size specifications.

⁹ http://www.bsac.dk/getattachment/Meetings/BSAC-meetings/BSAC-Pelagic-Working-Group/Techmeasures2019_1241ENG.pdf.aspx?lang=en-GB

Gear /mesh size

Stickleback escape through the regular meshes of 16 mm or 32 mm used in the pelagic fishery. A smaller mesh size should thus be used in a fishery targeting stickleback.

Pelagic trawls with a mesh size of 9-10 mm as used for sandeel could first be used in the trials (Finnish research¹⁰).

Other gears could also be used in a pilot fishery, such as the gear used in Norway pout fishery, or the Danish tunnel-shaped gear used in fisheries, in which the target species is smaller than the bycaught species, and using pelagic trawl nets with 16 mm or 32 mm mesh.

A feasibility study of the gears should be the first step in a pilot fishery/trial fishery.

Fishermen should be responsible for selecting the right gear for stickleback.

Trawling speed

Experience from the directed pelagic fishery shows that the same or lower speed could be used when targeting stickleback. This needs to be tried out during the pilot/trial fishery.

Fishing grounds / time

Stickleback is most widespread in the central Baltic area and less abundant along the southern shores (Germany, Poland).

The central Baltic (SDs 25-29) would be the best area for a targeted stickleback fishery. The fishery should be conducted away from the coastal areas in order to avoid habitat disturbance and bycatch. SDs 30-31 are also possible fishing areas.

Trawling during the daytime is reported to give a higher bycatch, depending on bycatch species. Trawling during the day in the higher/mid water would result in less bycatch of herring, since they tend to move towards the bottom during the day. On the other hand, salmon and other predatory fish might be more active during the day.

Areas to avoid in pilot fishery for stickleback

The areas of particular risk of bycatch of other species, including salmon migration routes, should be specified and avoided in the trial fishery.

¹⁰ <https://www.luke.fi/sv/nyheter/bestand-tillstand-och-tathet-nya-forskningsron-om-stromming-och-vassbuk-i-ostersjon/>

Data collection

The following data needs to be collected during the trials:

- catch composition, including bycatch
- gear/mesh size
- trawling speed
- position of vessel

Catch handling

Due to the spines, the catch of sticklebacks will probably require more vacuum to pump it. However experience shows that if there is a sufficient mix with sprat, stickleback do not cause such big problems.

Trial fisheries carried out so far

Denmark - there have been consultations with DTU Aqua and the Danish administration, and a pilot project has been confirmed, but no date decided.

Sweden - a pilot project on herring/sprat species combination combined with stickleback planned for 2020 has been delayed due to COVID 19 and is planned to start in the first quarter of 2021 with observers from the Swedish University of Agricultural Sciences.