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Policy Brief

Baltic Sea Centre
Stockholm University

For cod's sake – cut back fishing on herring and sprat

In the negotiations for next year's fishing in the Baltic Sea, the EU Member States could take a number of important decisions to address the cod crisis, such as major reductions in quotas for catches of flatfish, herring and sprat in the southern Baltic.

The largest cod stock in the Baltic Sea is on the verge of collapsing. The situation is so serious that in July 2019, the European Commission stopped fishing on that stock in ICES subdivisions (SD) 24-26, under Article 12.1 in the Common Fisheries Policy. The emergency measures will be in place for the rest of the year. According to the International Council for Exploration of the Seas (ICES), this could lead to an increase in the stock biomass of four percent, and thereby prevent a continued decline in the stock.

The assessment of Stockholm University's Baltic Sea Centre is that there is an acute need for further measures in SD 24-26 to achieve the objectives of the Marine Strategy Framework Directive for viable fish stocks, and a long-term and economically sustainable cod fishery in the Baltic Sea. There is as yet no scientific consensus as to the causes of the crisis of the eastern Baltic cod. But the sum of the current knowledge, combined with the critical situation for the cod, justify action on two of the most probable causes: lack of food and the impact of trawling.

In the negotiations on next year's fishing quotas for the Baltic Sea on the 14-15 October, the EU's fisheries ministers in the AgriFish Council should, therefore, prioritize the following:

Tailor everything to the cod

The acute crisis for the cod in the southern Baltic Sea requires management to focus particularly on areas SD 24-26, prioritize the recovery of the cod stock. That will also improve long-term socio-economic effects.

In addition to the cod fishery, which has been stopped this year and is recommended to be closed next year as well, there are primarily three commercial fisheries that impact on the cod: herring, sprat and flatfish. Management of these in SD 24-26 should be adapted to the circumstances and needs of the eastern cod stock.

Less herring fishing in SD 24-26

There are strong indications that the poor growth and worsened condition of the cod in the southern Baltic Sea are connected with a lack of food. Herring and sprat are the most important prey for cod. For the last ten years or so, the herring and sprat stocks are substantially stronger in the northern part of the Baltic than in the southern part where most of the cod is.

It is reasonable to assume that the reduced availability of forage fish in SD 24-26 contributes to the poor growth and lower weight of the eastern cod. Considerable reductions of the quotas for catches of herring in SD 24-26 during 2020 would improve the cod's access to forage fish and probably enhance the cod condition and growth.

RECOMMENDATIONS

In the negotiations on fishing opportunities for 2020 in the Baltic Sea the EU should take the following decisions:

- A continued ban on cod fishing in the southern Baltic, SD 24-26, for the whole year.
- Major reductions in the quotas for catches of the western cod stock.
- Major reductions in the quotas for catches of herring and sprat in SD 24-26.
- Co-management for the quotas for catches of herring and sprat, so that the two quotas are reduced in line with each other.
- Significant reductions in flatfish trawling in SD 24-26.

Photo: Ingemar Pettersson/Azote

Less sprat fishing in SD 24-26

Sprat is assessed and managed as a single stock in the Baltic, with distribution in SD 22-32. Due to the importance of sprat as forage fish for cod, the quota for 2020 should be defined and managed separately for SD 24-26. As with herring, most of the sprat stock is currently concentrated in the northern Baltic (SD 27-29 and 32), according to acoustic surveys. At the same time, there is a substantial sprat fishery farther south, in SD 24-26, where the cod concentrated. Last year more than 300 000 tonnes of Baltic sprat were landed. More than half (56%) was caught in SD 24-26.

ICES has long recommended reduced sprat fisheries in the area where the eastern cod stock is most dense. Several studies show that fishing for herring and sprat in the cod concentration area can give an increased food shortage for cod. Major cuts in sprat quotas in SD 24-26 next year can contribute to improved availability of forage fish and enhance cod condition and growth.

Co-management of herring and sprat

The pelagic fishing in SD 25-29 and 32 is almost exclusively trawling, and catches both herring and sprat at the same time. Trawling for herring without catching sprat is hardly possible or vice versa.

Last year, pelagic fisheries generally caught somewhat more sprat than herring: 39% herring and 48% sprat in SD 25, and 23% herring and 58% sprat in SD 26. There is, however, misreporting in the pelagic fishery, where commercial fishers take more sprat and less herring than is reported. The misreporting could lead to incorrect assessments of both stocks.

Given the alarming situation of the cod – and as the pelagic fisheries are in practice conducted as a mixed fishery – herring and sprat should be co-managed. Consequently, the quotas should be cut in parallel with each other.

No cod fishing in SD 24-26

ICES recommends no fishing for the eastern cod stock in 2020. The EU Commission proposes that there is no targeted fishing for the eastern stock. The scientists' recommendations should be followed. The eastern stock is currently in too poor shape for fishing.

Less fishing for the western cod stock

The mixing of the eastern and western stocks in the area west of Bornholm is one reason to reduce fishing on the western cod stock in 2020.

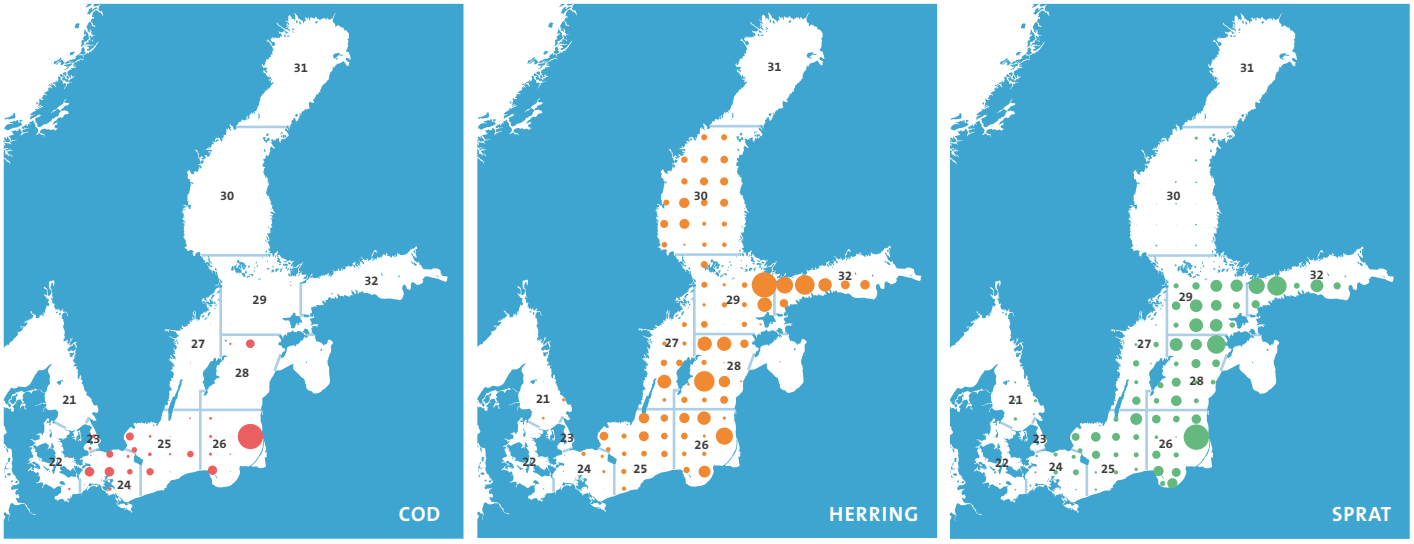
Further, the incoming class of the western cod (born 2016) was overestimated in the stock assessment in advance of the decision on fishing quotas for 2019, leading to a big increase in the quotas. As the stock is dominated by this year class, the quota for 2020 should be reduced significantly. To avoid quotas based on uncertain prognoses of stock increase, future advice and quotas should be based on actual observations.

Less trawling for flatfish

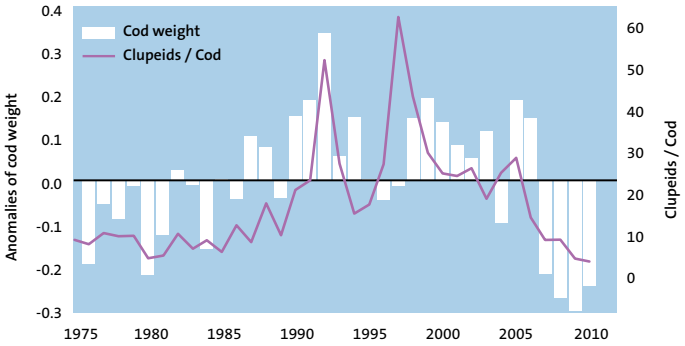
Under the current ban on cod fishing, no by-catch of cod is allowed in trawling for flatfish in SD 24-26. Certain by-catches of cod are to be discarded. As flatfish is caught by bottom-trawling, it is nearly impossible in practice to fish for flatfish without catching cod at the same time.

There is a fairly substantial fishery targeting flounder and plaice in the southern Baltic, often with significant by-catches of cod. Last year nearly 23 000 tonnes of flounder were caught in SD 24-26, with an estimated discard of about 6 900 tonnes. Given the crisis for the eastern cod stock, fishing for flatfish during 2020 should be cut significantly in SD 24-26.

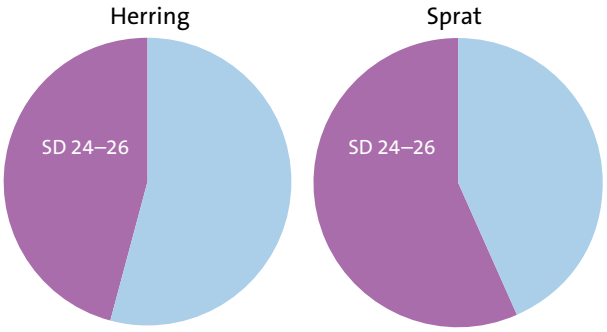
Photo: Tobias Dahlin/Azote



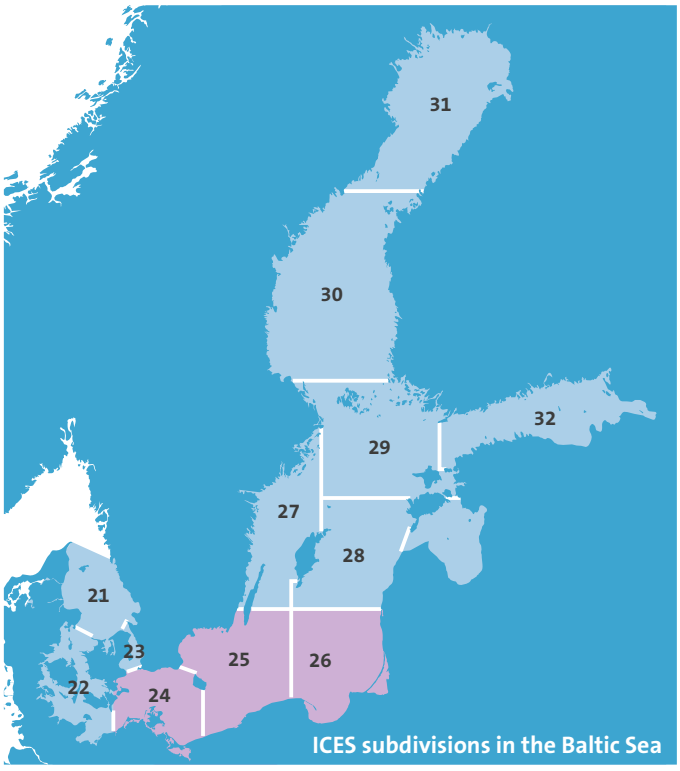
During the 1990's and 2000's, the range of the eastern cod stock has narrowed to the southwest, to the central Baltic Sea and the Bornholm Basin. At the same time, the range of herring and sprat has moved in the opposite direction, towards the northeastern Baltic. This lack of spatial overlap between the cod and its forage fish can have significant consequences for cod growth and condition. The density of herring and sprat in different areas varies somewhat from one year to another and between different occasions, but the general difference between the north and south remains. The above picture shows the measurements conducted during 2018. *From: ICES, WGBIFS 2019, Volume 1 Issue 37*



Anomalies in mean weight of cod (average of age-groups 4-7) in SD 25 (bars) compared with changes in the biomass of sprat and herring, relative to the number of adult cod (at age 4 and older) in the same area (line). *From: Eero et al. 2012*



In 2018, a total of 262 242 tonnes of herring were caught in the Baltic. Nearly half, 120 143 tonnes, were caught in SD 24-26, where the eastern cod is concentrated (17 887 tonnes in SD 24 and 102 266 tonnes in SD 25-26). In the same year, a total of 308 807 tonnes of sprat were caught in the Baltic. Slightly more than half, 174 400 tonnes, were caught in SD 24-26 where the cod is.



THE CRISIS OF THE EASTERN BALTIC COD

Photo: Tobias Dahlin/Azote

The eastern Baltic cod stock was severely decimated after having culminated at uniquely and unusually high levels in the middle of the 1980's. At the end of the 2000's, there were signs of increased recruitment. But in recent years new and serious problems have arisen: lower growth and condition, and a decline in health levels. The growth and condition of the cod have declined more or less continuously since the middle of the 1990's. The stock now has a severely constricted size structure.

The average size at maturation has also declined drastically, from about 40 cm to 20 cm. There is, at present, no scientific consensus about the reasons. Some of the most prominent theories are:

- **Lack of food**
  The diminished growth and condition seems to correlate with access to food and/or food consumption. For the past ten years, the herring and sprat stocks have been considerably denser in the northern Baltic than in the southern areas where the cod is normally found. Research shows the connection between the mean weight of the cod and the presence of herring and sprat. Further, preliminary results from a Swedish pilot study of the feeding of wild cod indicate that undersized cod in poor condition both eat and grow quickly when fed with herring. It is still unknown, however, if it is the quality or the quantity of the food that is the most critical factor.
- **Lack of oxygen**
  Lack of oxygen has been correlated with lower growth in the Baltic cod, as low oxygen levels in the deeper parts of the Baltic have increased since the beginning of the 1990's. Water with lower oxygen saturation may affect the metabolism directly, or the increase in hypoxic sea-bottom areas can lead to a lack of food as the production of bottom-dwelling organisms declines. However, the area of sea-bottoms with oxygen deficits is about the same today as it was at the end of the 1970's when the cod stock peaked in productivity. Further, the increase in areas with oxygen deficits has occurred in the northern parts of the Baltic, not in the south where the cod is concentrated today.
- **Increased selectivity and disrupted population dynamics**
  Cod trawling has become significantly more selective since the 1990's. The share of small and young fish caught is much lower than previously as the mesh size of the nets has been increased. If the presence of small cod gets too high, there is a risk of "sibling competition", where the high number of slowly growing cod impede each other's growth.
  For the cod, cannibalism may function as a mechanism for self-regulation of the size structure of the stock. This mechanism can be interrupted if the large individuals, who can weed out the stock, are gone.
  Enhanced selectivity coincides in time with the lower growth of the cod and with a strong increase in numbers of a few size classes just below the catchable size. A counter-argument is that the availability and/or quality of food can impair growth and condition regardless of changes in the size structure of the stock.
- **Seal parasites**
  There is a connection between the availability of so-called seal parasites in cod and the expansion of the grey seal populations in the southern Baltic. Studies in the current main area of cod concentrations in the southern Baltic, that is, east of Bornholm, show that the presence of these has increased from a very low level in 2012 to significantly higher levels a couple of years later. The seal-cod parasite problem in the stock took off long after growth levels had declined.

The possibility that the poor health condition and lower growth of the Baltic cod can have other causes, as yet not identified, cannot be eliminated. It is, therefore, vital to continue to study the question.

TO BRIDGE THE GAP BETWEEN SCIENCE AND POLICY

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Scientists, policy and communication experts work together to bridge the gap between science and policy.

We compile, analyse and synthesise scientific research on Baltic Sea related issues and communicate it at the right moment to the right actor in society.

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