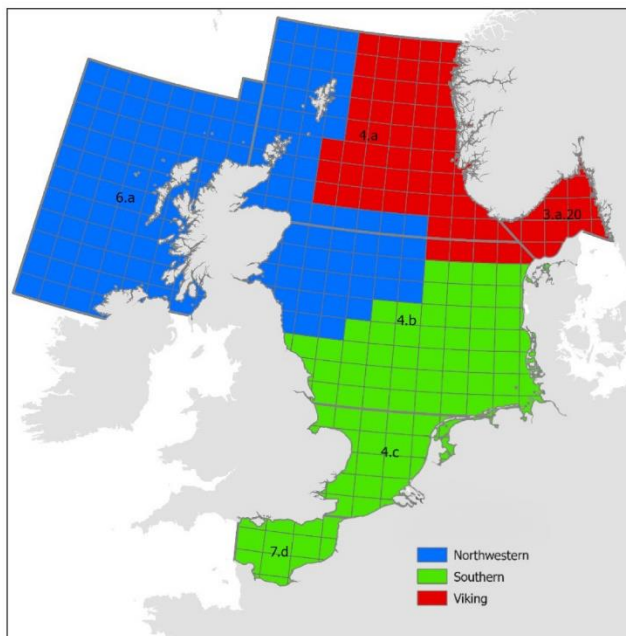


Explanations on the ICES advice for 2024



Northern Shelf Cod

Cod on the northern shelf has been divided into three substocks (Southern substock, North Western substock and Viking substock) since this year. Workshops to clarify the stock structure of cod in the North Sea and west of Scotland have shown that the three substocks differ genetically and/or in their biological characteristics (e.g. growth, maturity at age). The population sizes of the substocks have also developed differently. In particular, the southern substock shows a worse development than the north-western and Viking substock. For these reasons, ICES considers an assessment based on substocks to be appropriate.



According to the available stock calculations, all three substocks were fished above F_{MSY} in 2022. While the north-western substock is within safe biological limits at the beginning of 2023, the Viking substock is slightly below this limit. The southern substock is currently well outside safe biological limits and below the B_{lim} biomass limit. Since the southern substock in particular marks the southern limit of the cod distribution area, climatic changes play a role in addition to fishing.

The calculations based on the three substocks are based on the assumption that the substocks do not mix in the first quarter because they stay in their respective

substock areas (Figure 1) during the spawning season. In quarters two to four, however, substocks mix to a large degree.

By default, ICES gives advice based on the MSY approach. However, advice based on the MSY approach alone for each of the three substocks is not possible in this particular case, as no (genetic) data are available to quantify the mixing of the substocks in quarters two to four. An advice based purely on the MSY approach at the substock level is therefore not implementable for management, as without knowledge of the spatial distribution and mixing of substocks in quarters two to four, compliance with the advised catch levels for all substocks cannot be ensured.

Therefore, to address the problem of unknown spatial distribution and mixing of substocks in quarters two to four, the weakest substock (the southern substock) is protected according to ICES advice. To achieve this, the fishing mortality for the north-western and Viking substock was reduced in the forecasts to the same extent (by 60.4%) in a precautionary approach as is required for the southern substock under the MSY approach. The resulting advice is a maximum allowable catch (TAC) for the stock complex (22 691 tonnes). As in the past, this advice can be implemented by allocating it among the existing TAC areas. Assuming constant fishing patterns, mixing and stock parameters, the maximum allowable catch will result in none of the substocks being overfished.

The other numbers in the advice per substock ("...which corresponds to 13 529 tonnes from the northwestern substock, 5 240 tonnes from the Viking substock, and 3 922 tonnes from the southern substock) serve mainly to explain how the 22 691 tonnes were derived. Also, due to the mixing of substocks ICES advises that these substock TACs should not be interpreted as area-specific advice (e.g. 13 529 tonnes should not be set as a TAC for the blue area in Figure 1).

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