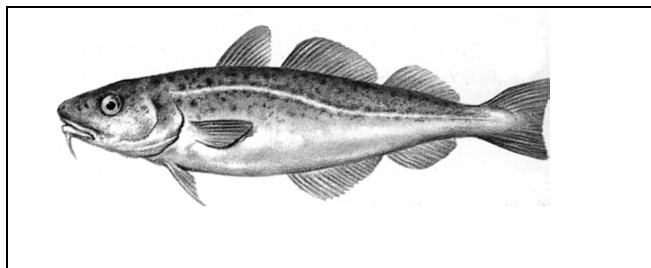


Nomination

Gadus morhua, Cod



Geographical extent

OSPAR Regions; All

Biogeographic zones: 1-20,

Region & Biogeographic zones specified for decline and/or threat: I, II, III/1-20

Gadus morhua has a distribution in the OSPAR Maritime Area that extends through the Barents Sea, to the North Sea, the Irish Sea, the waters around Iceland and the North East Atlantic (Wheeler, 1978). It is found close to shore and well down the continental shelf with adults making considerable migrations to reach spawning grounds. In the NE Atlantic, the Norwegian-Arctic stock in the Barents Sea, the Icelandic stock and the much smaller North Sea stock range widely. There are also local, stationary races which always remain close inshore.

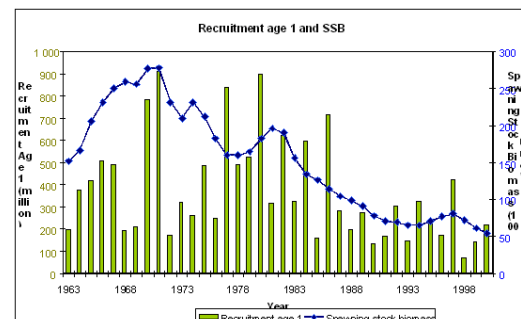
Application of the Texel-Faial criteria

There were two nominations for cod to be placed on the OSPAR list. The criteria common to both were decline with information also provided on threat.

Decline

Cod stocks have declined substantially in the OSPAR Area and the status of many individual stocks is poor. From the beginning of this century until the 1960s, landings of cod fluctuated between 50 000 tonnes and 100 000 tonnes in the North Sea. In the 1960s landings increased and reached a maximum of 350 000 tonnes in 1972. They then declined steadily from 1981 to 1991, since when they have shown a small increase to 140 000 tonnes in 1995. Apart from the 1993 year class, all year classes from 1987 onwards have been below average (Figure A). All the indications are that the current exploitation rate for cod in the North Sea is not sustainable and that a collapse of the stock is possible, unless there is a significant reduction in fishing pressure to bring the stock within Safe Biological Limits (IMM, 1997).

FIGURE A Historical data on recruitment and spawning stock biomass of North Sea Cod (Eurostat, 2002).



ICES (2002a) has reported the current status of the different stocks of cod that occur in the OSPAR Maritime Area as follows:

Icelandic Cod (Va) – Safe biological limits have not been defined for this stock; spawning biomass has been relatively stable for nearly twenty years, but is lower than biomasses observed prior to the 1980s.

Faroe Plateau (Vb1) – The spawning stock biomass (SSB) is above safe biological limits, but fishing mortality is so high that it is being harvested outside of safe biological limits.

Faroe Bank cod (Vb2) – Safe biological limits have not been determined for this stock but the biomass is above the long-term average.

Northeast Arctic cod (I and II) – The stock is outside safe biological limits, and SSB declined substantially through the 1990s.

Kattegat cod – The stock is outside safe biological limits, and SSB has declined substantially from the 1970s to the 1990s, with a few brief periods of improved status.

North Sea and Skagerrak (IV, VIId, and IIIa) The stock is outside safe biological limits. SSB has declined fairly consistently since the 1970s.

Cod West of Scotland (VIa) – The stock is outside safe biological limits. SSB has declined markedly since the 1980s.

Cod in the Irish Sea (VIIa) – The stock is outside safe biological limits. SSB declined markedly between 1989 and 1990, and slightly more thereafter.

Cod in VIle-k – The stock is outside safe biological limits. SSB has undergone two periods of increase and subsequent decrease since the late 1970s, and is currently near its historic low.

The OSPAR nominations did not distinguish between stocks when listing cod but raised the question of whether some stocks off Norway might be excluded. The ICES evaluation (above) reports that all except the Faroe Plateau cod are outside Safe Biological Limits at the present time and that the SSB for Icelandic and Faroe Bank cod have yet to be determined. It is reasonable to consider that stocks need to be at least above Safe Biological Limits not to qualify as threatened or declining, and that they are not being harvested outside such limits, as in the case of the Faroe Plateau cod. As a minimum, this listing is therefore relevant to all but the Icelandic and Faroe Bank cod stocks at the present time.

Threat

By far the largest threat to cod stocks comes from fisheries. This is due to overfishing in directed fisheries as well as bycatch in mixed fisheries where juvenile cod in particular may be caught and then discarded. The scale of this threat is very significant. In the North Sea, for example, the combination of the very high exploitation rate and the relatively advanced age at which cod mature (3 to 6 years), means that fewer than 1% of the 1-year-old fish in the North Sea are believed to survive to maturity. Landings of cod in this area therefore mainly consist of juvenile fish of two to three years of age (IMM, 1997). Depletion of food sources and global warming have also been suggested as contributory factors in the decline but any effects are likely to be minor compared to that from fishing.

Relevant additional considerations

Sufficiency of data

There is a substantive body of information on the status of the different cod stocks in the OSPAR Maritime Area from surveys and landings data. These go back for many decades and have been used by ICES to assess the status of the different stocks.

Changes in relation to natural variability

Natural variability will have played a part in the changing status of the cod. The evidence that depletion of food supplies and global warming have played an important role in declines of cod stocks is nevertheless incomplete and sometimes speculative. Although cod stocks are clearly affected by ocean conditions and food supply, evidence that these factors would have caused major declines in cod stocks, without overfishing, is weak (ICES, 2002a).

Expert judgement

Landings and survey data have been used to model changes in cod stocks and recommend fishing quotas. The scientific advice is provided by ICES and final decisions are taken by Member States of the European Community, Norwegian and Icelandic fisheries ministries. The first part of this exercise therefore uses scientific data and expert judgement. The second stage is a political process.

ICES evaluation

ICES confirms that cod stocks have declined substantially overall in the OSPAR area although they note that even for the most depressed stocks, populations are sufficiently large that there is no risk of extirpation, and for most or all stocks, declines appear to have ceased. The rebuilding of these stocks has been slow however, and in many cases promising increases in abundance in the 1980s or 1990s have not resulted in lasting improvements in stock status. As a result ICES have advised the European Commission and national governments that all fisheries that target cod in the North Sea, Skagerrak, Irish Sea and waters west of Scotland should be closed (ICES, 2002b – ACFM report October 2002). Cod stocks in these areas are now so depleted that the chance of a collapse must be seriously considered.

Threat and link to human activities

Cross-reference to checklist of human activities in OSPAR MPA Guidelines

Relevant human activity: Fishing, hunting, harvesting; *Category of effect of human activity:* Biological – removal of target and non-target species.

The principle threat to cod stocks in the OSPAR Maritime Area is fishing. Overexploitation is a clear threat and has been identified as the cause of the decline in stocks that are currently below Safe Biological Limits by ICES. This threat is clearly linked to human activities.

Management considerations

All cod stocks are already subject to management plans and several, including North Sea cod and Irish Sea cod, have Rebuilding Plans in place that focus on reducing fishing mortality. ICES did not consider listing by OSPAR would aid the recovery of these cod stocks as the above measures fall within the remit of fisheries organisations (ICES, 2002). OSPAR can however communicate an opinion on its concern about this species to the relevant bodies

and introduce any relevant supporting measures that fall within its own remit if such measures exist or are introduced in the future.

Further information

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Useful References:

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Wheeler, A. (1978). Key to the fishes of Northern Europe. Frederick Warne & Co, London.