

# Risk Assessment for Sourcing Seafood (RASS) profiles; cod (*Gadus morhua*) in Northern European and Scandinavian waters

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## Introduction

This document is a summary of information for a selection of Northeast Atlantic cod stocks derived from scientific assessments and risk assessed using Seafish's [RASS scoring guidance](#).

Fish populations are divided into fish stocks. A fish stock is a sub population of a fish species which inhabits a defined area of sea. Fish stocks are the units by which scientists and governments assess and manage stock sustainability, so each RASS profile relates to a specific stock within a defined sea area shown on the maps.

RASS applies a framework which scores risk levels for stocks on a five-point scale; from 1 very low risk to 5 very high risk, as indicated by the number of solid blue circles shown on the profiles below. Two aspects are assessed for each stock;

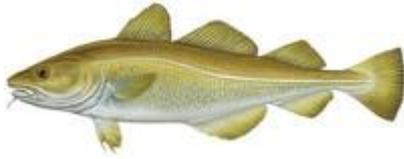
1. Stock status as advised by [ICES<sup>1</sup> annually](#)
2. Stock management, using information from ICES and other sources.

Scores should not be used in isolation to decide on a purchase of seafood from a stock. Profiles are designed to:

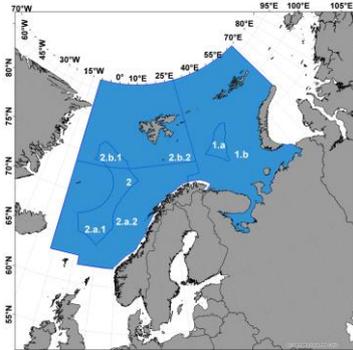
- enable the main features of a stock to be examined within a structured format,
- inform buyers of questions they might ask about a stock and where improvements could be made to improve sustainability

Inevitably there are several technical terms used. Please see the Glossary at the end of the document, where there are also links to further reading.

<sup>1</sup> ICES; International Council for Exploration of the Sea, the scientific body charged with carrying out stock assessment and advising Governments concerning management of Northeast Atlantic stocks



## Cod (*Gadus morhua*) in subareas 1 and 2 (Northeast Arctic)



Stock area for Northeast Arctic (Barents Sea) cod

### Stock status 2021



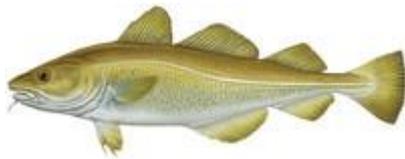
**ICES advised in 2021 that this stock was at full reproductive capacity and harvested sustainably at fishing mortality corresponding to maximum sustainable yield (MSY).** This corresponds a low risk under the [RASS scoring guidelines](#). The assessment showed that spawning stock biomass, an indication of the reproductive capacity of the stock, is forecast to decrease by 17% during 2022 if catches are in line with advice under the management plan. Although the spawning stock biomass is decreasing there are safeguards in the management plan (see below) intended to prevent the spawning stock biomass falling outside safe biological limits.

### Management 2022



**This stock is managed under a management plan assessed as precautionary by ICES and agreed by Norway and Russia under the Joint Norwegian–Russian Fisheries Commission.** The plan, implemented in 2017, is designed to maintain the stock within a range of rates of harvest corresponding to maximum sustainable yield. However, the catches of Northeast Arctic cod are mixed with Norwegian coastal cod from which it cannot be distinguished visually, the relative quantities of the two stocks landed are estimated from the structure of the otoliths sampled from the catches.

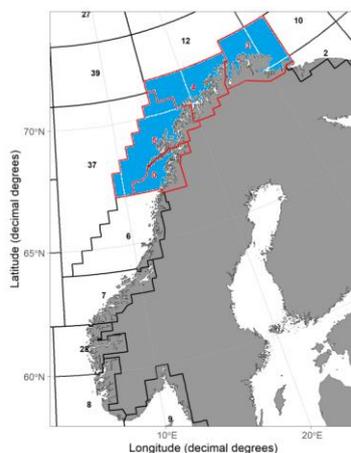
The TAC of 708,408 tonnes in 2022 is in line with the current ICES advice for 2022, incorporates catches of Norwegian coastal cod (see below). Hence, management is assessed as a moderate risk under the [RASS scoring guidelines](#). Compliance with regulations is good.



## Norwegian coastal cod

Recent investigations by ICES on the stock structure of Norwegian coastal stocks of cod have resulted in designation of two stocks. The northern stock in Norwegian coastal waters north of 67° N and the other stock, the southern stock, south of this latitude but North of 62°. Both these stocks overlap the Northeast Arctic stock described above. These two stocks are discussed separately.

### Cod (*Gadus morhua*) in subareas 1 and 2 north of 67°N (Norwegian Sea and Barents Sea), northern Norwegian coastal cod



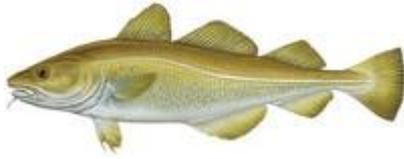
Stock Area for northern Norwegian coastal cod

## Stock status 2022

● ● ● ○ ○ Moderate risk

The most recent [ICES advice](#) places the spawning stock biomass above the agreed lower boundary under the management plan. Fishing mortality (that is the rate of removal by fishing) is above the level aimed at under the management plan. This status corresponds to a moderate risk score in the [RASS scoring guidelines](#).

There has been a generally improving trend in spawning stock biomass implying an improvement in reproductive capacity and fishing mortality over the period since 1997. The lower boundary for the spawning stock biomass, is set at the lowest observed spawning stock biomass during the period 2003-2020. If the stock falls below this level more stringent management measures should be implemented to conserve spawning stock biomass and hence reproductive capacity of the stock.



## Management

● ● ● ○ ○ Moderate risk

**This stock is caught in mixed catches with the Northeast arctic cod stock, and it is not possible to distinguish the fish from the two stocks visually.** Catches from the two stocks are distinguished using criteria relating to the structure of the otoliths (ear bones), taken from samples of the catch used to age the fish for assessment purposes, and they can also be distinguished genetically. Hence it is not possible to directly limit catches from this stock, so technical measures, that is measures which control the spatial and temporal distribution of fishing effort, and the design of gear, are used to manage the fisheries on this stock (see below).

The catch advice under the management plan for this stock for 2023 is 33% lower than the catch resulting from fishing at current levels, this implies a need for stronger regulatory measures. There is also a need to consider the substantial recreational catch from this stock.

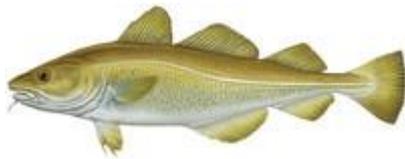
Whilst there have been signs of a recovery since the lowest levels in the late 1990s catches remain above the levels advised under the recently introduced management plan. The recent improvements in the assessment method and the introduction of a management plan for this stock should aid efforts to improve management of this stock.

Therefore, these measures are rational in relation to the known features of the stock, but may not, in their current form lead to a sustainable pattern of exploitation, which corresponds to a moderate score in the [RASS scoring guidelines](#).

### Management measures for Norwegian coastal cod

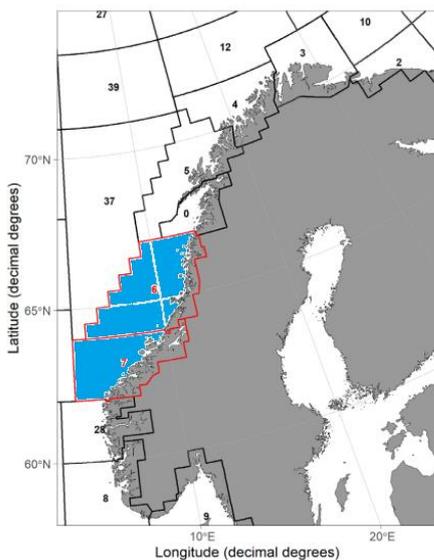
The measures include (listed by the ICES Arctic fisheries Working Group):

- A minimum catch size of 44 cm for both the commercial and recreational fisheries; discarding is banned, but there are limits on the level of bycatch of undersized fish
- Minimum mesh size
- Closure of areas with high concentration of juveniles
- Seasonal area closures aimed at avoiding capture of spawning fish
- Monitoring of the genetic make up of the catches to find out the proportion of Coastal and Northeast Arctic cod which are present in the areas closed to fishing, with management responding accordingly
- Regulations which close fjords to vessels larger than 15 m
- Closure of areas inside six nautical miles to trawling and effort restrictions on gill nets
- Regulation of the recreational fishery which is an important component of the catch



The overall aim of the regulations is to move parts of the traditional coastal fishery from the catching of coastal cod in the fjords to a cod fishery outside the fjords, where the proportion of northeast Arctic cod is higher. The regulations are also intended to protect juvenile and spawning cod.

### Cod (*Gadus morhua*) in Subarea 2 between 62°N and 67°N (Norwegian Sea), southern Norwegian coastal cod



Stock Area for southern Norwegian coastal cod

### Stock status 2021

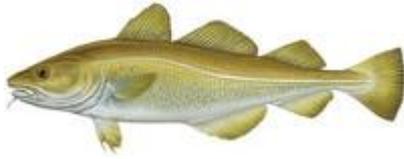
● ● ○ ○ ○ Low risk

The most recent [ICES advice](#) is based on a data limited assessment which indicates that the stock is at full reproductive capacity and exploited at a rate close to optimum for maximum sustainable yield. This corresponds to a low risk under the [RASS scoring guidance](#). However, because it is data limited (that is it does not use a full population model in the assessment) there is more uncertainty than for the Northern stock of coastal Norwegian cod.

### Management

● ● ● ○ ○ Moderate risk

This stock is caught in mixed catches with the Northeast arctic cod stock, and it is not possible to distinguish the fish from the two stocks visually. Catches from the

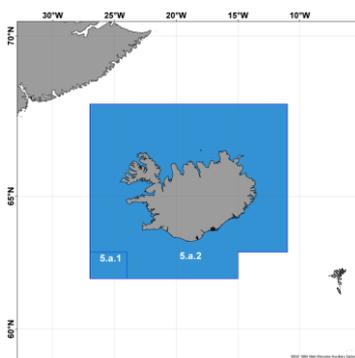


two stocks are distinguished using criteria relating to the structure of the otoliths, taken from samples of the catch in order to age the fish for assessment purposes and they can also be distinguished genetically. Hence it is not possible to directly limit catches from this stock, so technical measures are used to manage the fisheries on this stock.

The technical measures are as listed for the Northern Norwegian coastal stock of cod (see above). These are rational in relation to the known features of the stock, but may not, in their current form lead to a sustainable pattern of exploitation, which corresponds to a moderate risk score in the [RASS scoring guidelines](#)

The overall aim of the regulations is to move parts of the traditional coastal fishery from the catching of coastal cod in the fjords to a cod fishery outside the fjords, where the proportion of northeast Arctic cod is higher.

### Cod (*Gadus morhua*) in Division 5.a (Iceland grounds)



Stock area for Icelandic cod

### Stock status 2022

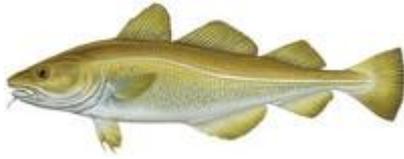


**This stock is subject to regular assessments by ICES. In 2022 ICES advised that the stock at full reproductive capacity and harvested sustainably but at a fishing mortality rate just at the optimum level.** This corresponds to a low risk under the [RASS scoring guidelines](#).

The ICES advice shows that the spawning stock biomass, an indication of the reproductive capacity of the stock, is expected to increase by 6% by 2024, if catches in 2023-24\* are in line with the management plan.

### Management 2022



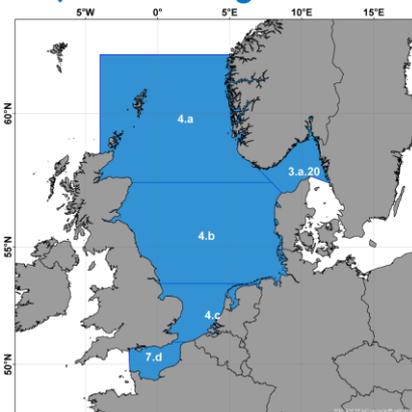


**This stock is managed under a management plan implemented by the Icelandic Government and assessed as precautionary and in accordance with the maximum sustainable yield approach by ICES.** The current version of the plan was implemented in 2016/17\*, although a similar approach has been adopted since 2010/11\*. The agreed Total Allowable Catches (TACs) and landings have corresponded to the advice in most years since 2012/13. Compliance with regulations is generally considered to be good. This year (2021/22\*) the TAC has been set at 220,417 tonnes which corresponds to the level of catch advised by ICES in 2021 under the management plan.

\*Icelandic fishing year = 1<sup>st</sup> September- 31<sup>st</sup> August.

## North Sea cod

### Cod (*Gadus morhua*) in Subarea 4, Division 7.d, and Subdivision 20 (North Sea, eastern English Channel, Skagerrak)



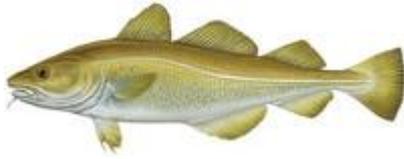
Stock area for North Sea cod

## Stock status 2022

● ● ● ● ○ High risk

The [ICES advice for 2022](#) shows that the spawning stock biomass (which is related to the stock's reproductive potential) is outside safe biological limits. However, the fishing mortality (that is the rate of removal by fishing) has decreased and is now below levels which would correspond to maximum sustainable yield (MSY). This corresponds to a high risk under the [RASS scoring guidelines](#).

Although the stock has been decreasing since around 2017, there are signs that this is levelling off in 2021, and the rate of fishing mortality has been decreasing since 2018 and is now inside precautionary levels. This implies that conditions may be set for stock recovery. The Total Allowable Catch ([TAC agreed for 2021](#)), is forecast to allow the spawning stock biomass to grow by 50% in 2022, with a 60% probability of being inside safe biological limits in 2023.



The TAC advised but not yet agreed for 2023 is forecast to allow further growth (by 20%) of the spawning stock biomass during 2023, with an 83.1% probability of being inside safe biological limits in 2024.

## Management

● ● ● ○ ○ Moderate risk

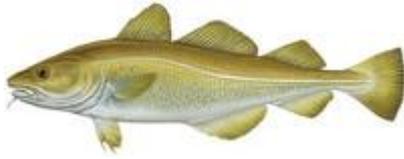
This stock is caught in a mixed demersal fishery, mostly by trawl and seine. The overall Total Allowable Catch (TAC) is agreed between the UK, EU and Norway. However, technical management measures are implemented within the respective EEZs. Within the UK EEZ all vessels fishing are required under their licence conditions to follow the [UK cod avoidance plan](#) designed to help the recovery of the cod stock, and helps fishers manage their catches in line with the agreed reduction in TAC.

This plan includes;

- Spawning/Seasonal Closures
- Real Time Closures: where areas are closed in response to high levels of cod in the catch observed by enforcement authorities when vessels are boarded
- Real Time Reporting; where Skippers can report high levels of cod in an area which can then be transmitted to the whole fleet as soon as possible. Skippers will be expected to make a judgment on whether they can continue fishing in the area without catching cod, or move away, to at least a 15 mile radius
- Selectivity – A default cod end mesh size of 120 mm is to be used for catching fish, but smaller mesh is permitted on the Nephrops grounds where other selective measures are required (further details in the cod avoidance plan)

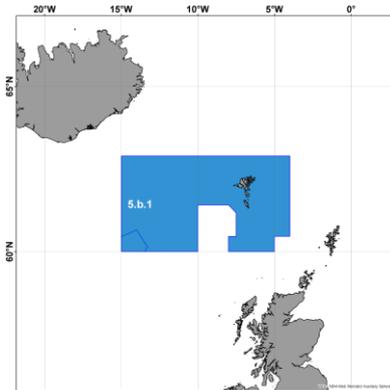
Whilst it is difficult to quantify the effects of these measures previous experience gained using these measures demonstrates that such measures can have an observable effect on cod mortality and biomass.

However, although there is a landing obligation in place within the fishery for UK, EU and Norwegian vessels, there is an issue with the reported catches not reflecting the total catch as estimated by observers. See the [ICES advice](#) for details. This may affect the accuracy of the assessments so the stock is scored a moderate risk under the [RASS scoring guidelines](#).



## Faroe cod

### Cod (*Gadus morhua*) in Subdivision 5.b.1 (Faroe Plateau)



#### Stock status; 2021



The most recent [ICES assessment](#) show that the spawning stock biomass is outside safe biological limits. However, the fishing mortality (that is the rate of removal by fishing) is inside precautionary levels, although not at optimal levels which would correspond to maximum sustainable yield (MSY). This corresponds a high risk under the [RASS scoring guidelines](#).

#### Management



This stock is managed under a management plan implemented by the Faroe Islands Government in 2021. The plan is designed to regulate the number of fishing days for the mixed fishery for cod and haddock (also saithe) in the Faroe Plateau fishery. Of importance is that the Faroe Plateau cod stock is in a much poorer state than the haddock stock, and the application of the MSY approach requires a reduction in fishing effort for both stocks, more so for cod, in 2022, relative to recent years.

However, the plan has not been evaluated by ICES, so it is currently uncertain whether the plan will lead to a sustainable pattern of exploitation in this mixed fishery, and this corresponds to a moderate risk in the [RASS scoring guidelines](#).

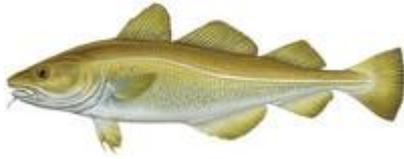


## Glossary

Term	Definition
<b>Exclusive Economic Zones; EEZ</b>	Area between coast and the 200-mile limits or the median line between jurisdictions where States have rights to exploit marine resources including fish stocks.
<b>Fishing Mortality: F</b>	The rate of mortality due to fishing. In some texts it is referred to as “Fishing pressure”. The scientists and managers seek to adjust fishing mortality through management measures such as catch limits (or TACs) on a stock to keep the stocks inside safe biological limits and optimise yields at MSY (see below)
<b>International Council for Exploration of the Sea: ICES</b>	International scientific body responsible for carrying out fish stock assessments in the ICES Area: the Northeast Atlantic and Baltic Seas. Also advises governments on other scientific issues concerning the marine environment <a href="http://www.ices.dk">www.ices.dk</a>
<b>Management plans</b>	Management plans are agreed between the parties exploiting a stock, usually governments. They can take the form of a set of decision rules guiding the management of the stock with pre agreed reference points. This is particularly important when the aim is to recover a stock from outside safe biological limits. Governments can ask ICES to carry out a scientific assessment of their plans to assess whether they are precautionary and will achieve the objectives set out for the stock
<b>Maximum Sustainable Yield: MSY</b>	Catching the maximum quantity that can safely be removed from the stock while maintaining its capacity to produce sustainable yields in the long term.
<b>Precautionary approach</b>	The ICES precautionary approach requires that the risk of a stock being outside safe biological limits is less than 5%-10% in any one year.
<b>Safe Biological Limits: SBL</b>	When a stock is inside safe biological limits there is considered to be sufficient reproductive capacity to support a fishery. If a stock is outside safe biological limits, there may not be sufficient reproductive capacity to support a fishery
<b>Spawning stock biomass; SSB</b>	This is an estimation of the quantity of breeding adults and hence the reproductive capacity of the stock, measured in tonnes.
<b>Total Allowable Catch: TAC</b>	The Total Allowable Catch (TAC) is a catch limit (expressed in tonnes for a fishery generally for a year or a fishing season.

## Further reading

Seafish has produced further information including detailed guides to fisheries management and assessment. These can be accessed from [here](#)



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