



Marine
Management
Organisation

Main stocks and their level of exploitation

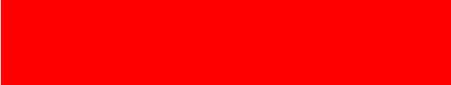


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Headline Statistics: stock assessments in 2019

- Red indicates stocks which are suffering reduced reproductive capacity.
- Orange indicates stocks which are at risk of suffering reduced reproductive capacity.
- Light green indicates stocks which are at full reproductive capacity and are being harvested sustainably.

Stock	Assessment indicator
North Sea Cod	
West of Scotland Cod	
North Sea, Skagerrak and West of Scotland Haddock	
North Sea Plaice	
Irish Sea Plaice	
North Sea Sole	
Irish Sea Sole	
Eastern Channel Sole	
Western Channel Sole	
North Sea Herring	
North East Atlantic Mackerel	

About this publication

This is an official statistics publication. The data and commentary here provides information on the status of key stocks in the North East Atlantic that are of commercial interest to the UK fleet.

The data is sourced from the ICES Stock Assessment Database:

<https://www.ices.dk/data/assessment-tools/Pages/stock-assessment-graphs.aspx>.

These stock assessments are reliant on data from individual countries. In the UK, activity data and biological data is mostly provided by the UK Marine Labs¹. Data supply is governed by the EU Data Collection Framework²:

https://ec.europa.eu/fisheries/cfp/fishing_rules/data_collection_en.

This report is a supplementary publication to the UK annual sea fisheries statistics released annually. It provides additional context on the sustainability of fisheries, not just the activity of the UK fleet.

The data that feeds into this publication is downloaded from ICES and compiled by CEFAS. The charts have been produced by the MMO and commentary by CEFAS.

The publication is split into two sections:

- [Section 1: Management and assessment of stocks](#)
- [Section 2: Status of key stocks](#)

¹ Mainly CEFAS (Centre for Environment, Fisheries and Aquaculture Science), Marine Scotland Science and AFBI (Agri-Food and BioSciences Institute),

² This is correct up until the end of 2020

Section 1: Management and assessment of stocks

The management of stocks

Fisheries are managed using the following methods, based on scientific advice:

- Total Allowable Catch - corresponding to a harvesting rate,
- Technical measures - mainly mesh sizes and minimum landing sizes, but sometimes closed areas, which determine the smallest fish that can be caught and landed.

As of the 1 February 2020, the UK is no longer an EU member state. As this publication relates to stock assessments in 2019 when the UK was in the European Union, the following text refers to the UK as an EU member state.

In the EU, the TAC is set each year by the Council of Ministers following negotiations on catch options that are provided by the Advisory Committee (ACOM) of the International Council for the Exploration of the Sea (ICES), an independent scientific body. For the main North Sea stocks these options consider the terms of a management agreement between the EU and Norway. Once a TAC is agreed for each stock and fishing area, it is allocated as quotas to Member States in accordance with fixed percentages based on historic fishing rights.

In past years, some seriously depleted stocks have become the subject of emergency measures and recovery plan proposals. Since 2003, the TAC and fishing mortality for some of these stocks have been linked to effort control measures that restrict the number of fishing days at sea per annum permitted for fleets capturing recovery species.

Scientific assessment and advice

ICES advice is based on stock assessments carried out at international working groups, where fishery scientists from the UK and the other nations compile fisheries data, biological data and survey data for use in fisheries science models. The age structure of a stock (the relative proportion of the different age groups) is largely determined by the fishing rate and by the numbers of young fish that enter the stock each year. When information on age structure is combined with data on landings, fishing effort, and the results of standardised stock surveys carried out by research vessels, the models are able to estimate the historical trend in fishing rate and stock abundance, up to the last full year of data. The assessment is then used to forecast the expected catch in an upcoming TAC year for a range of fishing rate options, taking into account the number of young fish that are expected to enter the stock, based either on survey data, or a recent historic average.

This chapter mainly summarises the present state of the main stocks based on advice from ACOM released during 2019, which evaluated stock assessments using fisheries data for years up to and including 2018, and survey data up to and including 2019. The 2019 ACOM

advice formed the basis for the EU proposals that led to the TACs and other measures agreed for 2020 by the EU Council of Ministers³.

The fisheries zones used to base ICES' stock assessments on are sometimes different from those used to allocate TACs. [Annex A](#) shows the generic title of each fishing zone and the specific areas included for ICES' stock assessments and EU TAC allocations.

Summary stock presentation

For the main fish stocks, a summary of ICES' data and assessments, where available, has been provided. These comprise four charts (a to d) showing total removals or landings, fishing mortality rates (F), recruitment and spawning stock biomass (SSB) since 1998 and exceptionally, since either 1996 or 1997. ICES' stock assessments since 2008 for each of these fisheries are also shown, except for the recently combined stock North Sea, Skagerrak and West of Scotland haddock whose assessments begin in 2014. A map of the fishing areas around the UK and EU is available to download here:

https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/fishing_areas_en.pdf.

It is important to note that the figures shown are, for each stock, the time series of estimates of abundance and fishing mortality mainly provided by ICES in 2019; with a few exceptions. These are based on fishery and survey data collected up to the most recent year, unless otherwise commented upon in the narrative provided.

Total removals or landings - Chart a

Total removals equals total reported fish landings plus an estimate for discards and may include estimates of non-attributive losses. Landings are used where total removal figures are not available and charts are headed accordingly.

Fishing mortality – Chart b

Fishing mortality rate (F) is a measure of the proportion of fish taken from a stock each year by fishing activity. Fishing mortality rates are calculated from mathematical models used to assess fish stocks. An F value of 1 indicates that approximately 60 per cent of a stock is removed by fishing activity.

ICES provides fisheries advice that is consistent with the broad international policy norms of the precautionary approach, maximum sustainable yield (MSY), and an ecosystem approach while at the same time responding to the specific needs of the management bodies requesting advice as clients of ICES.

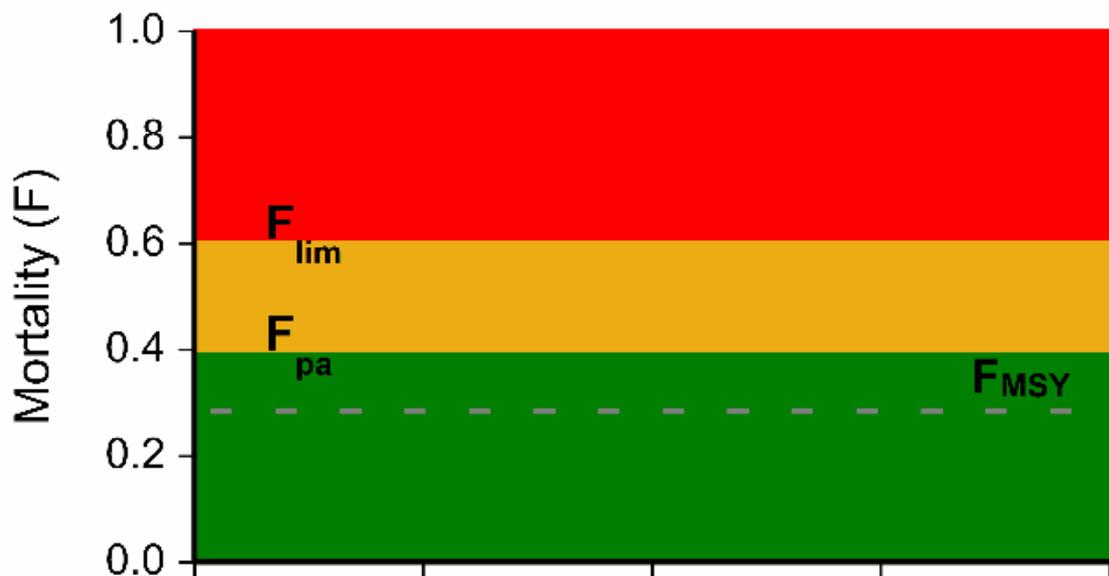
Since 1999 the ICES' advice has identified which catch options meet precautionary criteria. These criteria aim to ensure sustainability by keeping the fishing rate below a maximum precautionary level, F_{pa} (set low enough to allow a margin of error sufficient to keep F below an upper limit level, F_{lim}). The nature of ICES' fisheries advice has evolved over time and that evolution included advisory options for a transition process to attain full implementation of the MSY approach by 2015 where possible and, on a progressive, incremental basis at the latest by 2020. Whilst progress towards these goals has been continuing annually, a full

³ Details are contained within Council Regulation (EU) No 2020/123 of 27 January 2020 fixing for 2020 the fishing opportunities for certain fish stocks and groups of fish stocks, applicable in Union waters and, for Union vessels, in certain non-Union waters, and amending Regulation (EU) 2020/455 of 26 March 2020 and Regulation (EU) 2020/900 of 25 June 2020. Subsequently, changes may be made during 2020.

implementation of the MSY for all stocks has not yet been achieved. Ecosystem limitations on fisheries have typically not yet been identified in management policies in the ICES' area.

However, as the EU Marine Strategy Framework Directive (MSFD) is implemented, such limits will be recognized to achieve environmental objectives, especially regarding biodiversity, sea floor integrity, and food webs. In advance of this, ICES continues to strive towards providing advice that includes a greater range of information on fisheries and the marine ecosystem. Since 2012, ICES presented options that incorporate technical interactions for mixed demersal fisheries in the North Sea – options are given as scenarios based on single-stock assessments combined with knowledge on the species composition of catches in North Sea fisheries. In this way, for example, harvests may be further limited in consideration of potential fishery impacts on marine ecosystems beyond the impact on target fish stocks. Recently, ICES' options have incorporated MSY ranges where available. Additionally, ICES now provides similar options for mixed demersal fisheries in the Celtic Sea.

For each of the main stocks a time series of F will be plotted against a colour coded background highlighting the precautionary levels set by ICES as shown below. In addition, the value of F_{MSY} , presented as a grey hashed line, is shown when available.



Green: Harvested sustainably - where F is below F_{pa} the stock is deemed to be fished in a sustainable way and fishing pressure is below the level recommended by ICES.

Amber: At risk of being harvested unsustainably - where F is above F_{pa} and below F_{lim} then fishing pressure is higher than the maximum level recommended by ICES. If it is not reduced it could lead to depletion of the stock in the future.

Red: Harvested unsustainably - where F is above F_{lim} fishing pressure is much higher than the maximum level recommended by ICES and if continued is likely to deplete the stock, if it has not done so already.

For some stocks ICES may have given only a level for F_{pa} . In these cases, no amber region will appear on the chart. Additionally, in exceptional stock cases, ICES may review the data and modelling approaches for which the previously adopted precautionary fishing rates (F_{pa} and F_{lim}) are no longer appropriate, for example.

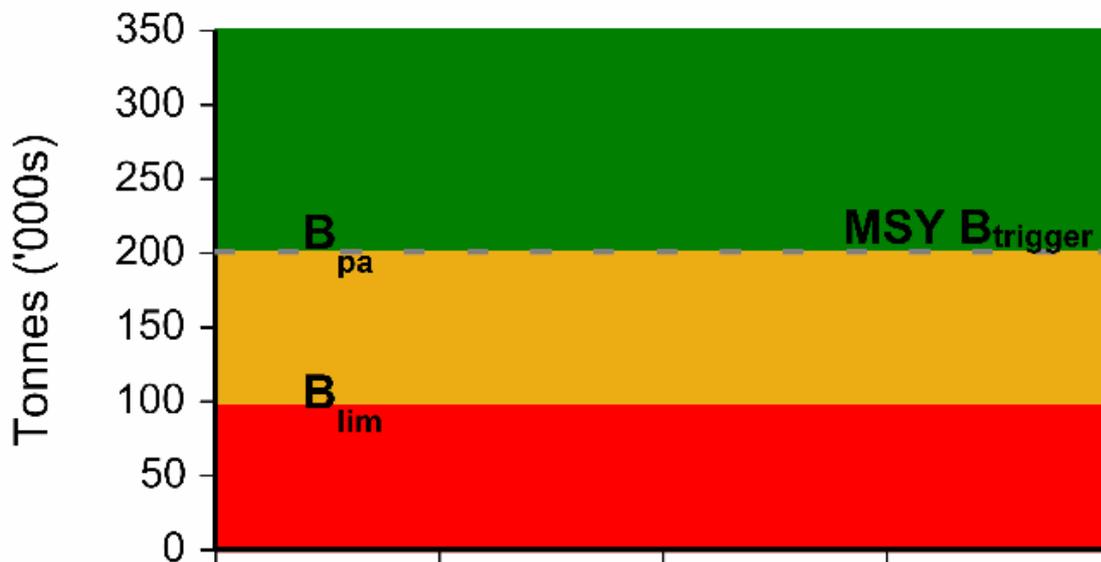
Recruitment – Chart c

Recruitment is the number of fish becoming available to a fishery stock in a year.

Spawning Stock Biomass (SSB) – Chart d

Spawning Stock Biomass (SSB) is the total estimated weight of all sexually mature fish in a stock. Since 1999 the ICES' advice has identified which catch options meet precautionary criteria. These criteria aim to ensure sustainability by keeping SSB above a minimum precautionary level, B_{pa} (set high enough to allow a margin of error sufficient to keep SSB above a lower limit level, B_{lim}).

For each of the main stocks a time series of SSB will be plotted against a colour coded background highlighting the precautionary levels set by ICES as shown below. In addition, the value of $MSY B_{trigger}$, presented as a grey hashed line, is shown when available. $MSY B_{trigger}$ is a biomass reference point that triggers a cautious response to reduce fishing mortality and is intended to safeguard against a low SSB when fishing at F_{MSY} .



Green: Full reproductive capacity - where SSB is above B_{pa} the fish stock is deemed to be in a healthy state and above the minimum level recommended by ICES.

Amber: At risk of suffering reduced reproductive capacity - where SSB is below B_{pa} but above B_{lim} the stock has been classified as not being so low that it could be classed as being depleted. However, the amount of adult fish has fallen to a level where there is a risk that production is likely to be reduced.

Red: Reduced reproductive capacity - where SSB is below B_{lim} the stock has been classified as depleted and the stock is unlikely to be as productive as it could be. This indicates that fishing pressure needs to be reduced in order to give the stock a chance to rebuild.

For some stocks ICES has only supplied a level for B_{pa} . In these cases, no amber region will appear on the chart.

Section 2: Status of key stocks

The fish stock assessments presented here are derived from annual ACOM reports, and are categorized according to the ICES' definition of the state of the stock. The ICES' advice on the state of stocks is based on assessments carried out using the most up to date data available in that year. It is important to note that assessments for previous years have not been updated using more recent data. The comparison of SSB with B_{pa} is done using the value of SSB at the beginning of the year in which the assessment was carried out. Where no B_{pa} value exists, the stock is treated as unknown.

North Sea Cod

ICES Sub-area IV (North Sea), ICES Division VII d (Eastern Channel) and ICES Division III a (Skagerrak)

An EU multiannual plan (MAP) has been agreed by the EU for this stock but this plan is not adopted by Norway. EU-Norway have requested ICES to undertake an evaluation of multiple management strategies. The international fishing rate has been high since the 1980s and has shown a decline since 2000. The number of young cod (recruitment) has been low since 1987, and even lower since 1998, causing serious concern. Since 2000, ICES advised that the TAC should be very low, or zero, and the EU reduced the TAC from 81,000 tonnes in 2000 to 48,600 tonnes in 2001, 49,300 tonnes in 2002, and 27,300 tonnes in 2003, 2004 and 2005. The minimum mesh size in the directed fisheries for cod was also increased to 120 mm in 2003. Agreement was reached in 2004 within the EU on a formal recovery plan that was operational during the TAC and management decision processes of 2004, effectively rendering the plan operational in 2005. Subsequently, this was repealed and replaced by Council Regulation (EC) No 1342/2008 to establish a long-term plan for cod stocks. The 2019 ICES' assessment indicates that fishing mortality has increased since 2016 and is above F_{lim} and that SSB has decreased since 2015 and is now below B_{lim} . The TAC for 2020 is 14,718 tonnes, compared with 29, 437 tonnes in 2019 and 43,156 tonnes in 2018.

Chart 5.1a: Total removals

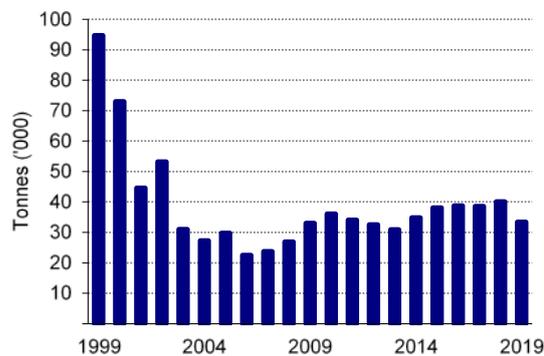


Chart 5.1b: Fishing mortality (F) – ages 2 - 4

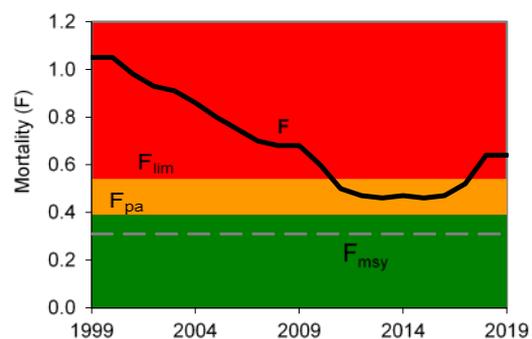


Chart 5.1c: Recruitment - age 1

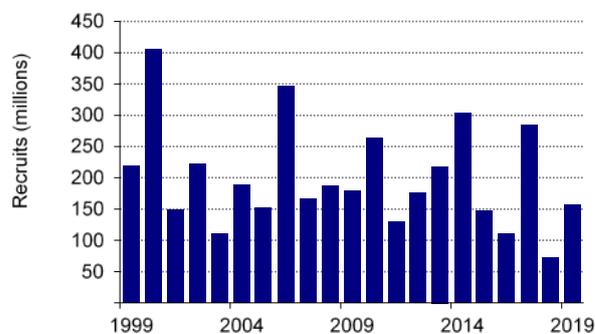
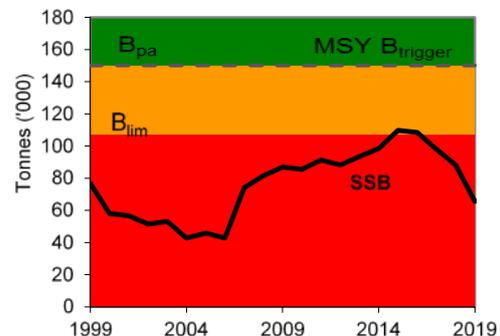


Chart 5.1d: Spawning stock biomass (SSB)



The cod stock in the North Sea has been assessed as suffering reduced reproductive capacity by ICES from 2009 to 2014. The spawning stock biomass has decreased since 2015 and is now below $MSY B_{trigger}$. In 2015 and 2016, it was assessed as at risk of suffering reduced reproductive capacity; whilst in 2017 the stock was assessed as being at full reproductive capacity and being harvested sustainably and in 2018 it was assessed as at risk of suffering reduced reproductive capacity. In 2019, it was assessed as suffering reduced reproductive capacity.



West of Scotland Cod

ICES Division VIa

Previously, the cod stocks west of Scotland have been assessed as heavily over-exploited with respect to the rate that would lead to high long-term yields (F_{MSY}). SSB has increased slowly from an all-time low in 2006 but remains well below B_{lim} . ICES called for a recovery plan in 2000, with low or zero catches, and the EU has since cut the cod TACs significantly, implemented two small closed areas, and in 2003 increased the main whitefish mesh size to 120 mm in line with the North Sea. Subsequently, the European Commission enacted Council Regulation (EC) No 423/2004 that established measures for the recovery of cod stocks; this was repealed and replaced by Council Regulation (EC) No 1342/2008 to establish a long-term plan for cod stocks which includes a west of Scotland management line that follows the 200m depth contour – the plan was further modified in 2016. In 2019, ICES assessed that fishing pressure on the stock is above F_{MSY} and that spawning stock size is below $MSY B_{trigger}$. The TAC for 2020 is a by-catch provision only, the same as in the eight previous years since 2012.

Chart 5.2a: Total removals

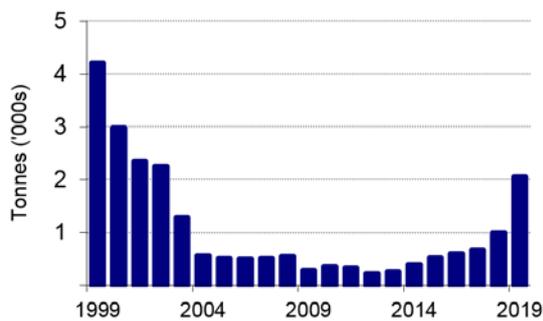


Chart 5.2b: Total mortality – ages 2 – 5

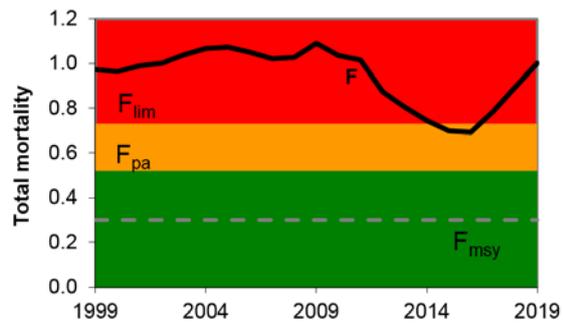


Chart 5.2c: Recruitment - age 1

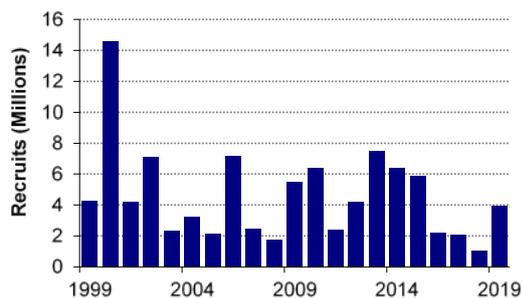
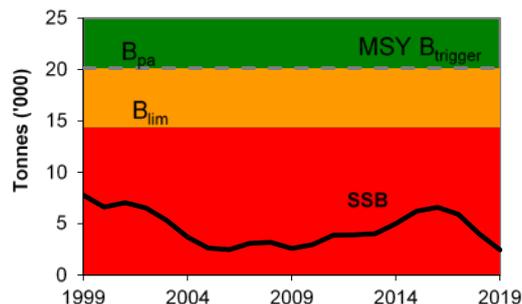


Chart 5.2d: Spawning stock biomass (SSB)



Cod stocks in the West of Scotland have been assessed as suffering reduced reproductive capacity from 2009 to 2019.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Stock Assessments	(a,b)	(a,b)	(a,b)								

(a) Total mortality cannot be accurately partitioned into F and M .

(b) Status uncertain in terms of F relative to F_{pa} , but suffering reduced reproductive capacity.

Irish Sea Cod

ICES Division VIIa (Irish Sea)

The European Parliament and the Council have published a multiannual plan (MAP) for the Western Waters which applies to demersal stocks including cod in the Irish Sea. The cod stocks in the Irish Sea were depleted, and landings fell rapidly during the 1980s and 1990s. Historically, the fishing rate has been very high, spawning stocks have fallen below both the precautionary and the lower limit level, and the abundance of young cod has been in decline since 1990. After 2000, the EU significantly reduced the cod TAC, closed the area in the western Irish Sea during the spawning season, and increased the main whitefish mesh size to 100 mm. The European Commission enacted a Council Regulation (EC) No 423/2004 that established measures for the recovery of cod stocks which was repealed and replaced by Council Regulation (EC) No 1342/2008 to establish a long-term plan for cod stocks. The assessment was benchmarked by ICES in 2017 and provides a significant change in perception showing that the fishing mortality rate has been below F_{MSY} since 2013 and very low in 2016 and 2017. Since 2019, the ICES analytical assessment has been replaced by a data-limited stock assessment. The cod TAC agreed for 2020 is 257 tonnes, compared with 807 tonnes in 2019 and 695 tonnes in 2018.

Irish Sea cod has been assessed to be suffering reduced reproductive capacity between 2009 and 2015. In 2016 and 2017, the stock was assessed as at risk and in 2018 the stock was assessed as being at full reproductive capacity and being harvested sustainably. In 2019, the available information was inadequate to determine stock status relative to precautionary boundaries.



Celtic Sea Cod

ICES Divisions VIIe-k

The EU multiannual plan (MAP) for stocks in the Western Waters and adjacent waters applies to this stock. The plan specifies conditions for setting fishing opportunities depending on stock status and making use of the F_{MSY} range for the stock. Internationally, cod in ICES Divisions VIIe-k is caught in a range of fisheries including gadoid trawlers, *Nephrops* trawlers, otter trawlers, beam trawlers and gill-netters. This species is managed within a wider area; namely, ICES Divisions VIIb-k (excluding ICES Division VIId from 2009), ICES Sub-areas VIII, IX, X and CECAF 34.1.1, but ICES' advice applies only to ICES Divisions VIIe-k. The Celtic Sea cod stock was excluded from the EU's 2004 cod recovery plan. In 2012 the ICES' cod assessment revised the time series estimates of fishing rate, spawning stock and recruitment, following a review of data and modelling approaches for which the previously adopted precautionary fishing rates (F_{pa} and F_{lim}) were no longer appropriate. The assessment of the stock was delayed by ICES in 2020 to incorporate the review of national data from some EU Member States.

In 2009 and 2010 an assessment was unable to be made of cod in the Celtic Sea. Subsequently in 2011, cod in the Celtic Sea was assessed as being at full reproductive capacity and being harvested sustainably, and in 2012, 2013 and 2014 it was assessed as remaining at full reproductive capacity but with fishing rate unknown with respect to precautionary values F_{pa} and F_{lim} . In 2015 and 2016, it was assessed as at risk of suffering reduced reproductive capacity; whilst in 2017 and 2018 the stock was assessed as suffering reduced reproductive capacity.



North Sea, Skagerrak and West of Scotland Haddock

ICES Sub-area IV (North Sea) and ICES Divisions IIIa (Skagerrak – Kattegat) and VIa (West of Scotland)

The haddock stock in the North Sea and Skagerrak had been managed under an EU-Norway long-term management plan which intended to constrain harvesting within safe biological limits and to provide for sustainable fisheries. An EU multiannual plan (MAP) has been agreed by the EU for this stock but this plan is not adopted by Norway. EU-Norway have requested ICES to undertake an evaluation of multiple management strategies. Recruitment has been characterized by occasional large year-classes, the last of which was the strong 1999 year-class. Since the 2014 assessment, this haddock stock has been combined with haddock in the Northern Shelf and assessed as a single stock by ICES.

The 2019 assessment shows that the fishing mortality rate has been fluctuating above F_{MSY} for the entire time series and that SSB has been mostly above $MSY B_{trigger}$ since 2002; and that apart from the relatively strong 2005 and 2009 year-classes recent recruitment has been poor. In the North Sea, the haddock TAC was set at 41,767 tonnes in 2018, 28,950 tonnes in 2019 and 35,653 tonnes in 2020. In the West of Scotland, the TAC for 2020 is 3,973 tonnes, compared with 3,226 tonnes in 2019 and 4,654 tonnes in 2018.

Chart 5.5a: Total removals

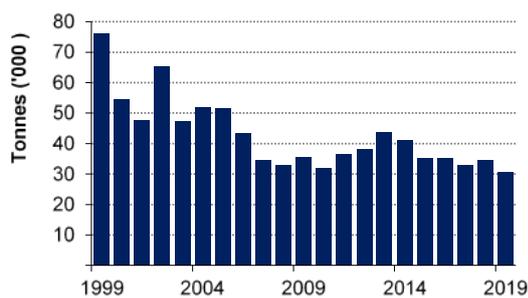


Chart 5.5b: Fishing mortality (F) – ages 2 – 4

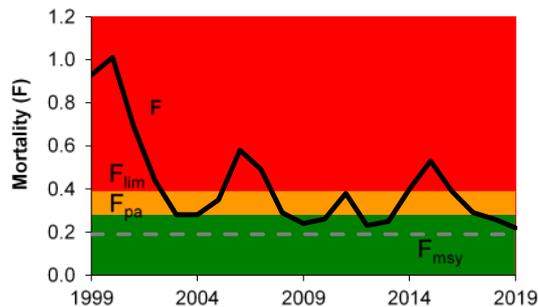


Chart 5.5c: Recruitment - age 0

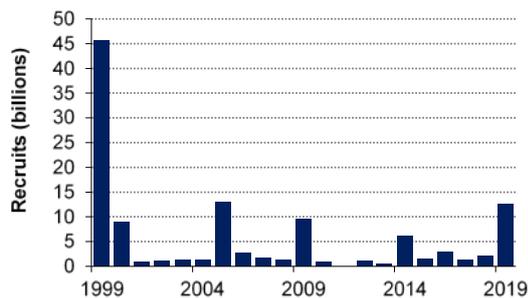
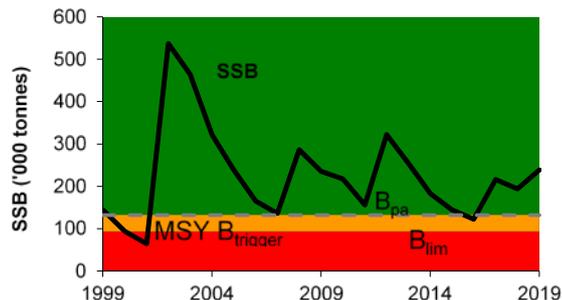


Chart 5.5d: Spawning stock biomass (SSB)



In 2014 and 2015, ICES has assessed the new combined area haddock stock as being at full reproductive capacity and being harvested sustainably. In 2016, however, it was assessed as at risk of suffering reduced reproductive capacity; whilst in 2017, 2018 and 2019 the stock was again assessed as being at full reproductive capacity and being harvested sustainably.



North Sea Plaice

ICES Sub-area IV (North Sea)

The plaice assessments have included estimates of discards since 2004. This has changed the perception of the plaice stock relative to precautionary values. It shows landings and SSB falling steeply after 1990 as the fishing rate increased to a peak in 1998, with SSB currently well above $MSY B_{trigger}$, and with the fishing rate estimated to have decreased to below F_{pa} and consistent with high long-term yields (F_{MSY}). The TAC for 2020 is 146,852 tonnes, compared with 125,435 tonnes in 2019 and 112,643 tonnes in 2018.

Chart 5.6a: Total removals

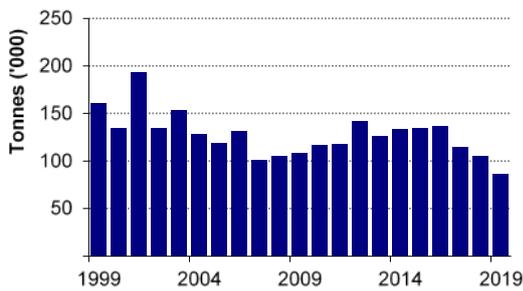


Chart 5.6b: Fishing mortality (F) – ages 2 - 6

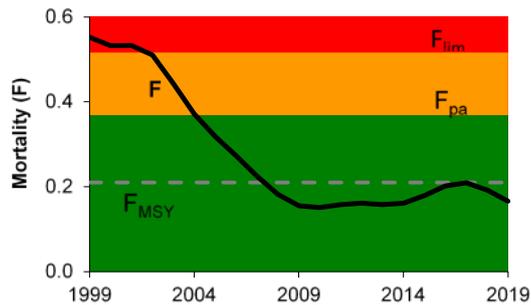


Chart 5.6c: Recruitment - age 1

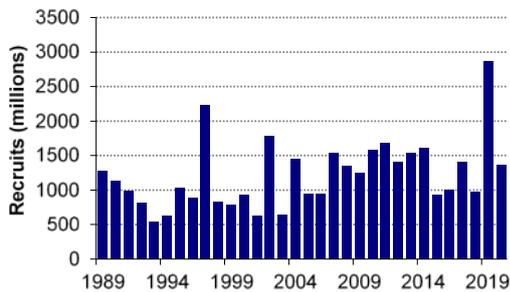
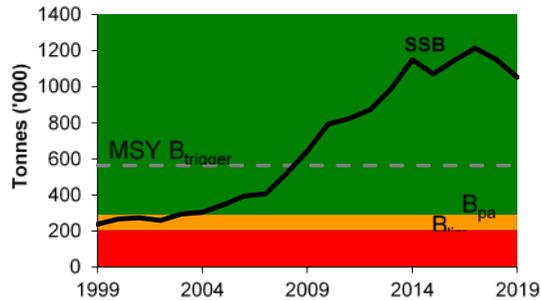


Chart 5.6d: Spawning stock biomass (SSB)



The North Sea plaice assessment in 2007 was that the stock was at risk of suffering reduced reproductive capacity. Subsequent assessments have improved and since 2009 the stock is assessed to be at full reproductive capacity and being harvested sustainably.



Irish Sea Plaice

ICES Division VIIa (Irish Sea)

The fishing rate on Irish Sea plaice has shown a declining trend since the early 1990s and the SSB trend show an increase in stock size since the mid-1990s. Discards are included in the ICES' assessment; together with discard survivability estimates. The assessment was benchmarked by ICES in 2017 and precautionary boundaries provided; together with values for F_{MSY} and $MSY B_{trigger}$. The plaice TAC agreed for 2020 is 2,790 tonnes, compared with 3,075 tonnes in 2019 and 1,793 tonnes in 2018.

Chart 5.7a: Total landings

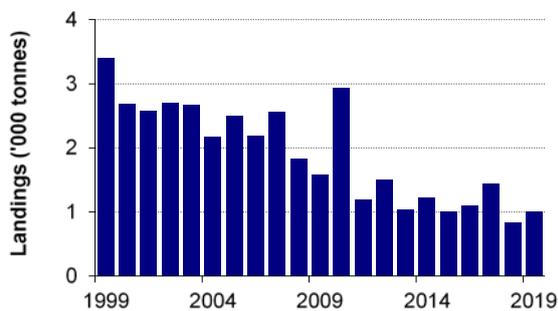


Chart 5.7b: Fishing mortality (F) – ages 3 – 6

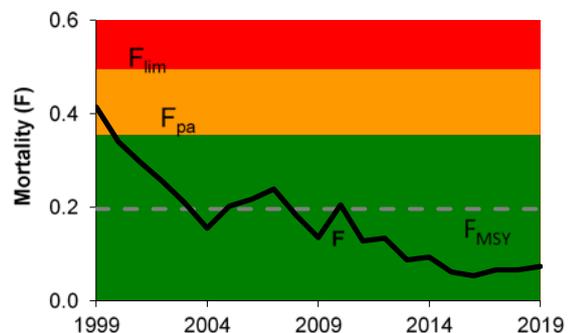


Chart 5.7c: Recruitment - age 2

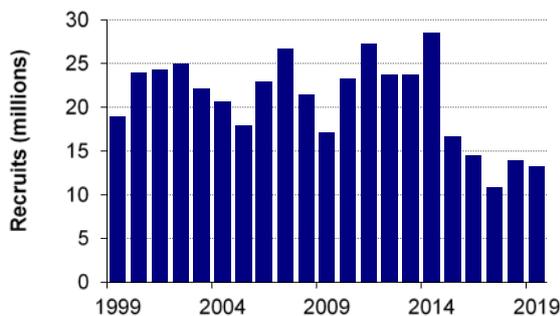
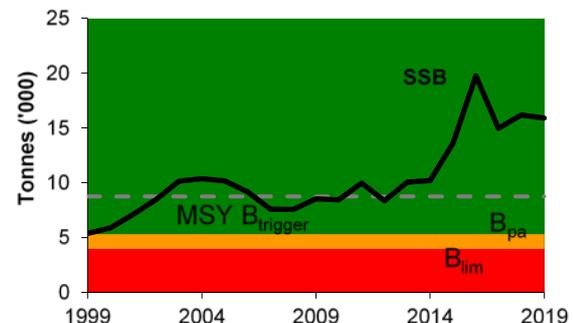


Chart 5.7d: Spawning stock biomass (SSB)



In 2009 Irish Sea plaice has been assessed as being at full reproductive capacity and being harvested sustainably. Since 2010 the available information has been inadequate to determine stock status relative to precautionary boundaries until 2017 when the stock was again assessed as being at full reproductive capacity and being harvested sustainably.



North Sea Sole

ICES Sub-area IV (North Sea)

The fishing rate for North Sea sole has fluctuated above the precautionary level in the past, declining since 1999 and close to the rate that would lead to high long-term yields (F_{MSY}) in 2017. Periodic good year-classes have raised SSB above the precautionary level from time to time. The stock was benchmarked by ICES in 2020 utilizing additional survey data, covering an important area of the stock distribution, which revised the SSB downward and is reflected in these graphs. As a consequence, in 2020, the stock will be assessed as suffering reduced reproductive capacity. The TAC agreed for 2020 is 17,545 tonnes, compared with 12,555 tonnes in 2019 and 15,694 tonnes in 2018.

Chart 5.8a: Total landings

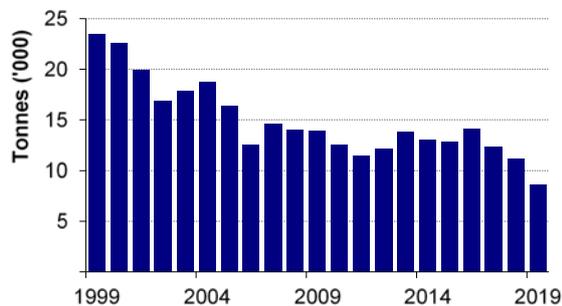


Chart 5.8b: Fishing mortality (F) – ages 2 - 6

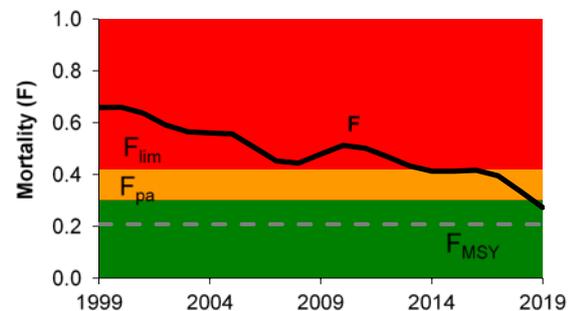


Chart 5.8c: Recruitment - age 1

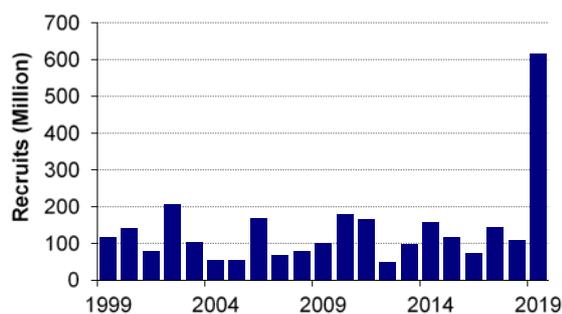
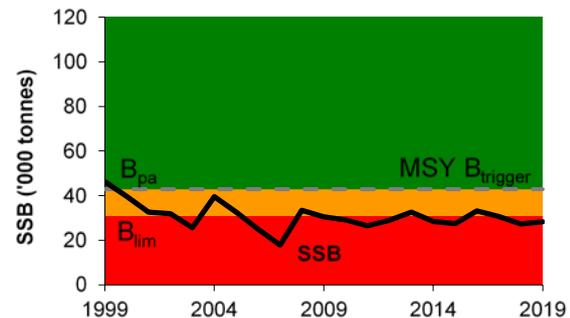


Chart 5.8d: Spawning stock biomass (SSB)



North Sea sole assessments have varied widely since 2008. However, since 2011 North Sea sole has been assessed as being at full reproductive capacity and being harvested sustainably.



Irish Sea Sole

ICES Division VIIa (Irish Sea)

The Irish Sea sole fishing rate is presently well below the rate that would lead to high long-term yields (F_{MSY}). SSB has declined since the mid-1980s to low levels and has been below B_{lim} since 2004. The sole TAC agreed for 2020 is 457 tonnes, compared with 414 tonnes in 2019 and 40 tonnes in the four previous years (2019, 2018, 2017 and 2016).

Chart 5.9a: Total landings

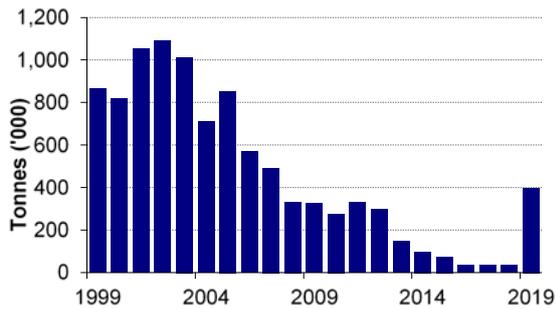


Chart 5.9b: Fishing mortality (F) – ages 4 - 7

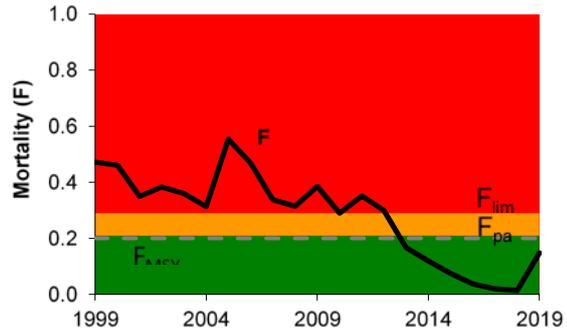


Chart 5.9c: Recruitment - age 2

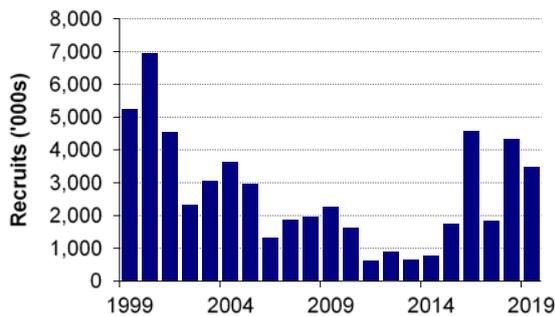
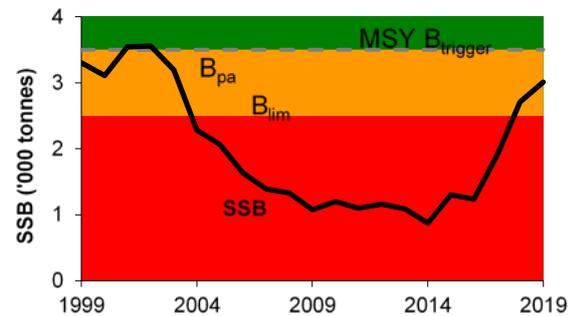


Chart 5.9d: Spawning stock biomass (SSB)



Between 2009 and 2018, inclusive the stock has been assessed as suffering reduced reproductive capacity. In 2019, however, it was assessed as at risk of suffering reduced reproductive capacity.



Eastern Channel Sole

ICES Division VIIId (Eastern Channel)

Sole stocks in the Eastern and Western Channel are biologically discrete stocks that are assessed and managed separately. In the larger, Eastern Channel stock, the assessed fishing rate has generally been above F_{MSY} throughout the time series but has recently been decreasing, and SSB has fluctuated without trend since the 1980s. The TAC for 2020 is 2,797 tonnes, compared with 2,515 tonnes in 2019 and 3,405 tonnes in 2018.

The Eastern Channel sole stock had consistently been assessed at full reproductive capacity since 2009. However, from 2009 to 2015 the stock was judged to be at risk of being harvested unsustainably. In 2016, 2017 and 2018 the stock was assessed at risk of suffering reduced reproductive capacity but in 2019 the stock was assessed as being at full reproductive capacity and being harvested sustainably.



Western Channel Sole

ICES Division VIIe (Western Channel)

Sole stocks in the Eastern and Western Channel are biologically discrete stocks that are assessed and managed separately. In the smaller, Western Channel stock, the accepted assessment in 2008 indicated that the assessed fishing rate has been above F_{pa} since 1979, and that SSB has declined since 1980 to an historic low. The assessment in 2009 was merely indicative of trends, while in 2010 an analytical assessment was provided but one for which it was not possible to determine current stock status relative to precautionary boundaries. Since 2012 an analytical assessment has been provided but one for which it was not possible to determine stock status relative to precautionary boundaries as these were withdrawn by ICES for this stock until 2015. Fishing mortality is estimated to have been below F_{MSY} since 2009 and SSB has been above $MSY B_{trigger}$ since 2008. The TAC for 2020 is 1,478 tonnes, compared with 1,242 tonnes in 2019 and 1,202 tonnes in 2018.

Chart 5.11a: Total landings

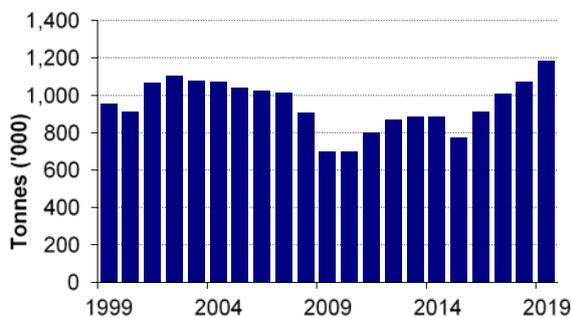


Chart 5.11b: Fishing mortality (F) – ages 3 - 7

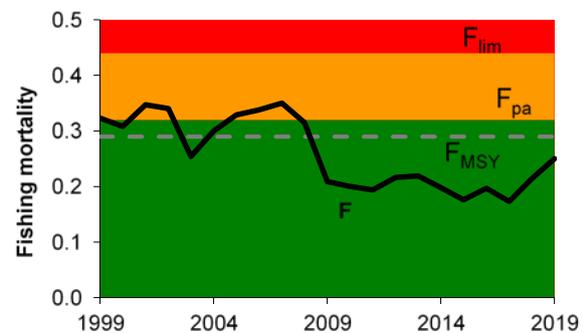


Chart 5.11c: Recruitment - age 1

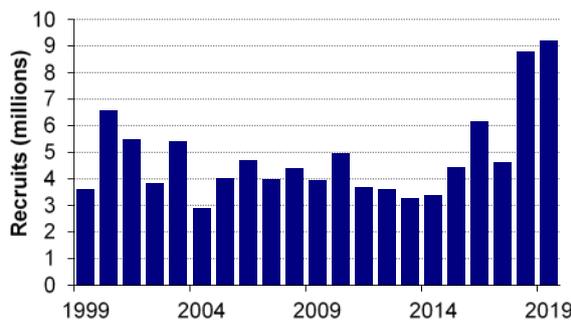
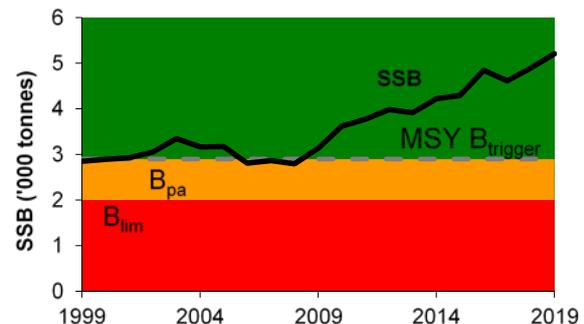


Chart 5.11d: Spawning stock biomass (SSB)



Assessments were unable to be made in 2009 and 2010 while in 2011 an assessment was undertaken but the precautionary reference points were withdrawn by ICES. The same situation is the case in 2012, 2013 and 2014. Subsequently, however, in the years 2015-2019, it was assessed as being at full reproductive capacity and being harvested sustainably.



North Sea Herring

ICES Sub-area IV (North Sea), ICES Division VII d (Eastern Channel) and ICES Division III a (Skagerrak – Kattegat)

The North Sea herring stock, which collapsed in the 1970s and was closed to fishing for several years, subsequently recovered, and although it fell back in the mid-1990s, it has again been rehabilitated. In 2019, SSB was above the precautionary level with a moderate fishing rate on both juvenile and adult herring. Recruitment was below average between 2003 and 2013, stronger in 2014 but then returning to lower values in recent years; with the two lowest year-classes falling within the recent five of the last 30 years. The TAC in 2020 is 385,008 tonnes (the same as in 2019), compared with 600,588 tonnes in 2018.

Chart 5.12a: Total landings

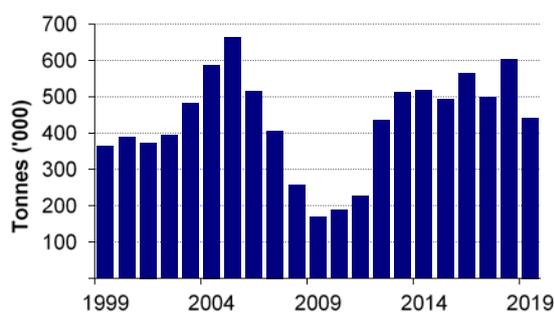


Chart 5.12b: Fishing mortality (F) – ages 2 - 6

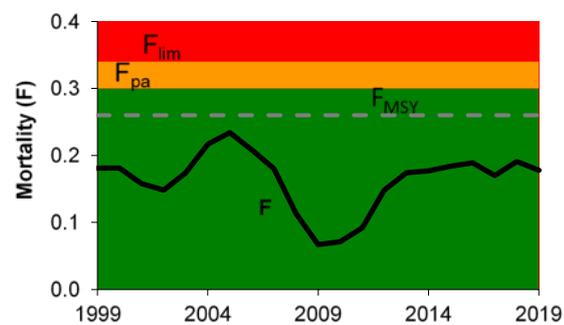


Chart 5.12c: Recruitment - age 0

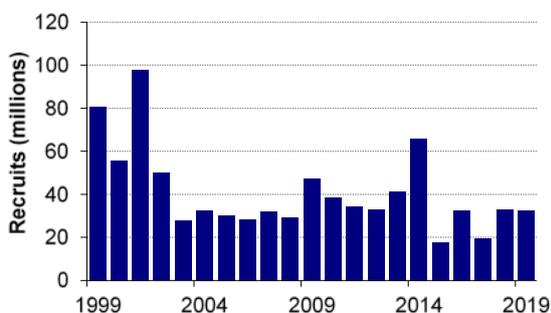
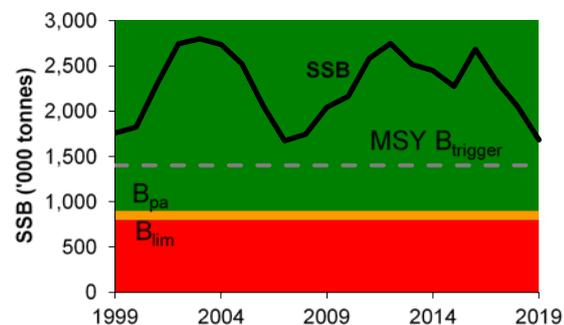


Chart 5.12d: Spawning stock biomass (SSB)



North Sea herring was assessed as a stock at risk of suffering reduced reproductive capacity for the years 2009 and 2010. Since 2011, North Sea herring has been assessed as being at full reproductive capacity and being harvested sustainably below the rate that would lead to high long-term yields.



North East Atlantic Mackerel

Combined Southern, Western and North Sea spawning components

Mackerel is assessed as the single North East Atlantic (NEA) stock which combines the Southern, Western and North Sea spawning components. SSB has increased considerably since the late 2000s and remains high above MSY $B_{trigger}$ since 2008. There has been a succession of strong year-classes since the early 2000s, with year-classes since 2011 estimated to be above average. New management measures adopted from 2009 led to an increase of almost 33 per cent in the 2009 TAC in the NEA for mackerel, while maintaining measures to protect the North Sea spawning component. A TAC of 922,064 tonnes was agreed for 2020, with shares to be allocated in line with the 2014 Mackerel Arrangement for the stock; compared with 653,438 tonnes in 2019 and 816,797 tonnes in 2018. For reference, the TAC was not agreed for the years 2011 to 2016, inclusive.

ICES stock assessment: North East Atlantic Mackerel

From 2009 to 2012 North East Atlantic mackerel has been assessed as being at full reproductive capacity but either at risk of or being harvested unsustainably. Between 2013 and 2015, the stock has been assessed as being at full reproductive capacity and being harvested sustainably. In 2016 North East Atlantic mackerel was judged to be at risk of being harvested unsustainably, although assessed as being at full reproductive capacity; whilst in 2017, 2018 and 2019 the stock was again assessed as being at full reproductive capacity and being harvested sustainably.



(a) Status uncertain in terms of SSB relative to B_{pa} ; but harvested unsustainably

Annex A: Fishing areas used for ICES stock assessments and EU TAC allocations

Species	Title	Fishing areas included in:	
		ICES Stock Assessments	EU TAC/Quota allocations
Cod	North Sea	IV, VIIId, IIIa	IIa (EC), IV ^(a)
	West of Scotland	VIa	Vb (EC), VIa
	Irish Sea	VIIa	VIIa
	Celtic Sea	VIIe-k	VII (ex VIIa, VIIId), VIII, IX, X; CEECAF 34.1.1 (EC)
Haddock	North Sea, Skagerrak and West of Scotland	IV, IIIa, VIa	IIa (EC), IV Vb (EC), VIa
Plaice	North Sea	IV	IIa (EC), IV
	Irish Sea	VIIa	VIIa
Sole	North Sea	IV	II, IV
	Irish Sea	VIIa	VIIa
	Eastern Channel	VIIId	VIIId
	Western Channel	VIIe	VIIe
Herring	North Sea	IV, VIIId, IIIa	IV (EC and Norway North of 53° 30'N) ^(a)
Mackerel	North East Atlantic	All ICES sub-areas	II (ex EC), Vb (EC), VI, VII, VIIIabde, XII, XIV ^(a)

Source: ICES and the European Commission

(a) Only largest stock shown. TACs have been set for other fishing areas covered by the stock assessment.

Further information and contact

More information on ICES' precautionary levels and the details of F_{MSY} and $MSY B_{trigger}$ can be found on the ICES web site: www.ices.dk.

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