



Gadus morhua

The world catch of cod was 1.487 million tonnes (t) in 2011 (1). Cod is the most popular whitefish in the UK, where 14,100 t was landed in 2011 with a first sale value of £29.6 million (2). Retail consumption of cod was approximately 39,441 t product weight in 2011 (3) which approximates to 136,000 t whole fish weight or approximately 9% of the world catch.

The two main species which can be described legally as cod in UK markets are; Atlantic cod (*Gadus morhua*) and Pacific cod (*Gadus macrocephalus*)¹ (3a). Wild captured fish of these two species form the vast majority of the cod available in UK markets. Cod is farmed in Nordic Countries and Canada, but farmed cod is currently a minor component of the British market (4). Total world production in 2011 was 16,126 t (1).

Cod stocks in the North Sea, off the West of Scotland and in the Irish Sea are at low levels compared with their potential, and fisheries on these stocks have been subjected to strict management regimes to promote stock recovery. However, Atlantic cod stocks in the Baltic Sea and North east Arctic are healthy, and twelve fisheries landing cod from these stocks are

currently MSC certified, as are two fisheries off Alaska (5).

Almost all stocks of cod are assessed regularly by scientists. Efforts are being made to manage cod fisheries sustainably, and the fishing industry is actively involved in these initiatives. These include improved gear selectivity, 'real time closures' to protect young cod, and 'catch quota' measures to reduce discarding, all aimed at conserving cod stocks.

There is a long-term moratorium on directed cod fishing in many areas off the east coast of Canada and the United States, though TACs are set for some stocks, and management measures are rigorously implemented

The purpose of this guide is to give buyers background information on the status of these stocks and on some of the measures taken to protect them.

BUYERS' TOP TIPS

Know your source of supply and stock status

Biological stocks are self-contained populations, each of which has a different spawning area, though there may be some mixing between them at other times. Cod 'management stocks' mostly coincide with biological stocks. These areas contain the main fisheries.

Ensure your supplies are from legal fisheries

Illegal landing of cod has decreased in recent years. However, it does occur in some areas, so knowing your source of supply is an important element in guarding against illegally landed cod

An informed buying policy

Buyers need an informed view of stock status and management. Although some cod stocks are considered depleted, there are some legal fisheries in situations where fisheries managers have judged that the fishery should remain open. Under the precautionary approach, they should have formulated plans to improve the stocks' chances of recovery.

Seafish Responsible Sourcing Service

This is one of a series of Responsible Sourcing Guides produced by Seafish
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<http://tinyurl.com/seafishrsg>

¹ There is also Greenland cod *Gadus ogac*

Status of cod stocks March 2013

Assessment

The International Council for Exploration of the Seas (ICES) conducts annual assessments on the ten most important North-east Atlantic cod stocks, whilst its American counterparts assess cod stocks in the North-west Atlantic and the Barents Sea. The assessment models use information on the number of cod at each age in the catch of the commercial fishery, together with data collected by fishery-independent trawl surveys. Where an analytical assessment is not possible, advice on stock abundance changes is based on surveys or landings trends.

Maximum Sustainable Yield (MSY) and the Precautionary Approach (PA)

Current ICES advice on cod stocks is given on the basis of MSY and the precautionary approach (6). MSY means fishing at a level that takes the maximum catch (yield) that can safely be removed from a fish stock, on a continuous basis, whilst maintaining its long-term productive capacity, and is achieved by keeping the Spawning Stock Biomass (SSB) above the biomass action point **MSY_{BTrigger}**. The precautionary approach aims to limit fishing mortality (F) and catches to levels that avoid depleting the stock's reproductive capacity, keeping its SSB above its biomass reference level (defined as **B_{pa}**; see Fig. 3).

These concepts are illustrated in the schematic (Fig. 1). This shows how catches from an unfished stock would increase in line with exploitation (or fishing mortality, F), up to a point where the total mortality on the stock causes so many fish to be caught at a relatively small size (and discarded or landed) that the potential production of the stock, based on growth of individual fish, is not realised ('growth overfishing'). The peak of this curve represents MSY and indicates where **F_{MSY}** lies.

However, providing sufficient fish survive to become adults and spawn, they may still have the

reproductive capacity to replace themselves. Stock collapse can occur when fishing mortality reaches a level (**F_{lim}**) where removals from a stock are so high, and its spawning capacity is so diminished, that fewer and fewer juveniles are produced. So, not only is the size of the stock being reduced by too high a level of exploitation, but there are fewer juvenile fish to replace those that are caught, and stock levels are likely to fall even lower ('recruit overfishing'). The yellow area between the green (inside safe limits) and red (outside safe limits) zones in the schematic and stock trajectories (North Sea example at Fig 2 & 3) represents levels of F or SSB that management should seek to avoid to ensure that the stock has a high probability of remaining sustainable.

Scientific advice given under the twin MSY / precautionary approach strategy will aim to either achieve catches consistent with fishing levels that would result in **F_{MSY}**, or reduce fishing mortality to return the SSB to within safe biological limits (> **B_{pa}** or **MSY_{BTrigger}**). For the majority of cod fisheries, there are management plans, and scientific advice is provided on catches that are compatible with such plans.

Figure 1: Schematic of ICES' MSY and PA reference points in relation to fishing mortality and Yield

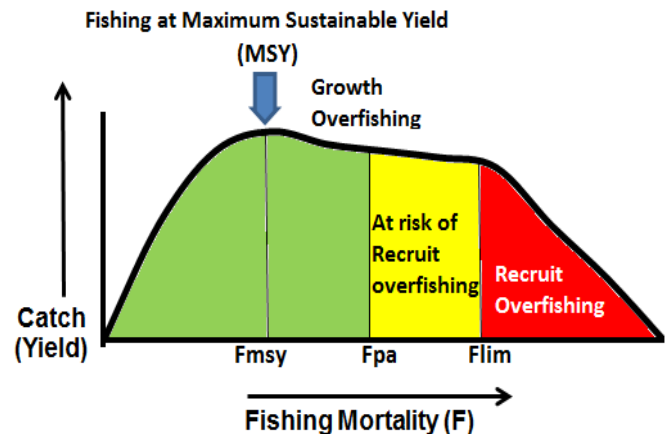


Table 1: Management Stock (colour keyed to Fig. 4 on page 8)	Agreed TAC 2013 (t) (8)	Advisory TAC 2013 (t)	Scientific advice and management (June 2012 ICES advice) (7)
NORTH EAST ATLANTIC COD STOCKS (<i>Gadus morhua</i>) (7)– SEE FIGURE 4			
Inside safe biological limits			
Northeast Arctic (Barents Sea) Areas I and II	1,000,000	940,000 Coastal cod by catch should be kept as low as possible	Recent recruitment has been above average, and SSB has been above MSY $B_{trigger}$ since 2002 and is now to near its highest observed level. Fishing mortality reduced from well above F_{lim} in 1997 to below F_{MSY} in 2007, and is now close to its lowest value. A Joint Russian–Norwegian Fisheries Commission management plan has been implemented since 2004 (11) aimed at maintaining high long-term yield and year-to-year stability. ICES considers the plan to be in accordance with the precautionary approach and not in contradiction to the MSY framework (though MSY reference points not defined). This plan is used as the basis for ICES advice.
Iceland ICES Va	195,000 <i>September 2012 – August 2013</i>	196,000	Recruitment over the last 20 years has been around the long-term average, and SSB has increased from an historic low in 1993 and is now higher than has been observed over the last four decades. Fishing mortality has declined significantly in the last decade and is presently at an historical low and below likely candidates for F_{pa} . A management plan for Icelandic cod was adopted in 2009, which ICES considers is in accordance with the precautionary approach and the ICES MSY framework and advises accordingly (MSY reference points not defined).
Central Baltic ICES 25-32	61,565 Russian quota, not available	65,900	Recruitment since 1999 has been lower than previously, though the abundance of the 2006 - 2009 year classes is above the average of the last 20 years. The SSB has increased rapidly from an historic low in 2005 and is presently considered by ICES to be above the precautionary level. Fishing mortality in 2008–2011 was estimated to be the lowest in the series and just below F_{MSY} . A multi-annual plan for cod in the Baltic Sea was agreed by the EU in 2007 (9), which ICES considers to be in accordance with the precautionary approach and uses as a basis for advice. However, there is a large difference between the current estimate of F_{MSY} and the target F in the management plan, which is currently under revision.
South west Baltic ICES 22 – 24	20,043	20,800	Recruitment has been lower than the long-term average since 2003, and SSB has been fluctuating just above the precautionary level B_{pa} since 2000. Fishing mortality has decreased since the late 1990s and fell below the target specified in the management plan in 2010 and 2011, but remains above F_{MSY} . A management plan agreed in 2007 by the EU (9) is considered by ICES to be in accordance with the precautionary approach, and is used as a basis for advice (see above).

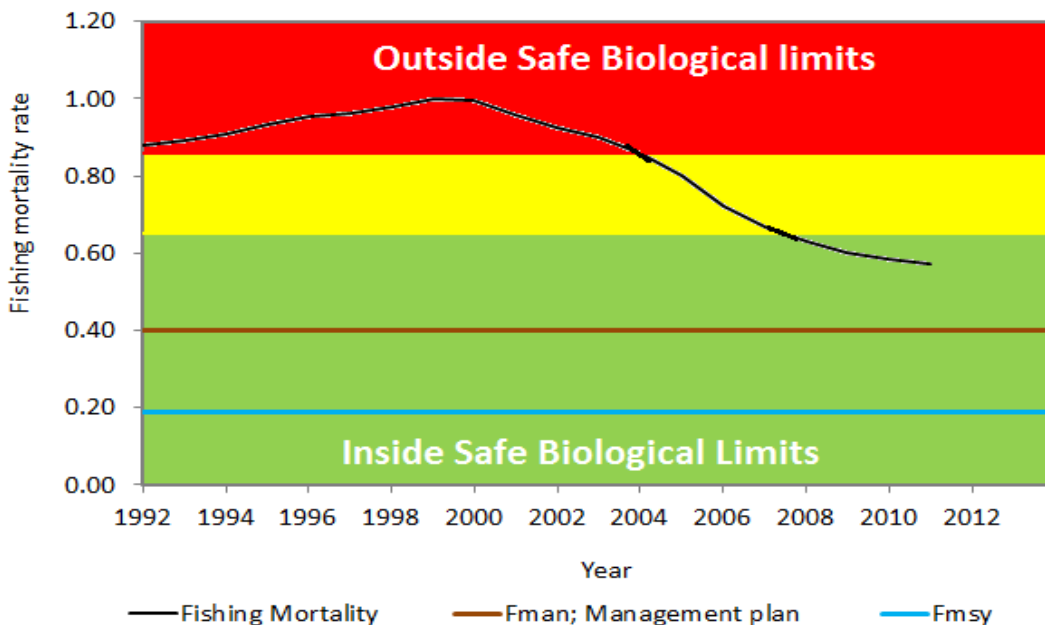
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Celtic Sea and west of Ireland VIIb-c, VIIe-k, VIII, IX & X	10,200	10,200	The stock is highly dependent on incoming recruitment, and the 2009 year class is estimated to be the strongest since 1987. As a consequence, SSB has increased from below B_{lim} to well above $MSY_{Btrigger}$ since 2010. Fishing mortality was high and varied without trend from 1987 until 2005, since when it has declined to around F_{MSY} in 2011. ICES advice is given on the basis of the MSY approach. Since 2005, areas off Cornwall and Ireland have been closed to fishing to protect spawning cod.
Stocks at risk of being outside safe biological limits and below biomass action point $B_{MSY-trigger}$			
Faroe Plateau ICES Vb1	Fishing effort limits (days-at-sea)	4,800	Only one (2008) of the last 9 year classes is estimated to be above average and SSB has remained around B_{lim} since 2005, well below $MSY_{Btrigger}$. Fishing mortality has decreased since 2002, but is still above precautionary levels and F_{MSY} . Previous management of this fishery (days-at-sea) translated into an average fishing mortality which ICES considers to be inconsistent with the PA and the MSY approaches. ICES' advice, on the basis of the MSY approach, is to reduce F by 63% in 2013. The Faroese administration has developed a management plan based on MSY principles developed by ICES, which has yet to be agreed politically.
Outside safe biological limits			
North Sea and Skagerrak IV, VIId, IIIa	30,116 (plus 3,177 to facilitate the catch quota trials)	<25,441 in line with management plan	Though SSB has increased from the historical low in 2006 and fishing mortality has declined since 2000, recruitment since 2000 has been poor and the stock remains outside safe biological limits. Fishing mortality declined from 2000 and is now below F_{pa} , but is estimated to be well above F_{MSY} . The EU–Norway agreement management plan was updated in 2008 and the EU has adopted a long-term plan for this stock with the same aims (10,11). ICES concluded that both plans are in accordance with the precautionary approach if implemented and enforced. ICES advice is given on the basis of the EU–Norway management plan. See Figures 2 and 3 for trajectories and projections.
Irish Sea ICES VIIa	285 (in line with management plan)	Lowest possible catch	Recruitment has shown a declining trend over the last 40 years and has been very low since 2005. SSB has declined ten-fold since the late 1980s, and the stock has had reduced reproductive capacity since the mid-1990s. Fishing mortality has been very high in the last 20 years, and remains well above F_{MSY} . A long-term plan was agreed by the EU in 2008 (10), which ICES considers not to be in accordance with the precautionary approach. ICES advice, on the basis of MSY approach, is that there should be no directed fishing for cod, and bycatch and discards should be minimised.

Table 1: Management Stock (colour keyed to Fig. 4 on page 8)	Agreed TAC 2013 (t) (8)	Advisory TAC 2013 (t)	Scientific advice and management (June 2012 ICES advice) (7)
West of Scotland ICES VIa	0	Lowest possible level	Recruitment has shown a declining trend over the last 30 years, and has been below the long-term average for the last 10 years. SSB has increased from an all-time low in 2006, but remains at a very low level (well below B_{lim}). Fishing mortality has been above F_{lim} for at least 30 years. ICES has not been able to evaluate if the long-term management plan (10) is in accordance with the precautionary approach. ICES advice, on the basis of the MSY approach, is that there should be no directed cod fisheries and that bycatch and discards should be minimized.
Reference points not fully defined			
Greenland ICES XIV and NAFO 1	Offshore fishery: 5,000 t in line with manag't plan (exploratory fishery)	No fishing	The available information indicates that the cod biomass is low compared to before the 1990s, though the offshore component started to recover in 2005 and the inshore recruitment has shown signs of improvement since 2000. The stock size and exploitation rates are unknown, however, and ICES is not able to estimate biological reference points for the two stock complexes due to lack of information. ICES has been investigating the genetic relationship between the inshore and offshore stocks.
	Inshore fishery: 15,000 t in West. There is no inshore fishery in East.	8,000	In 2011 the Greenlandic Government adopted a management plan for the offshore cod stocks. This plan has not been evaluated by ICES, which advises, based on precautionary considerations, that no fishery should take place in 2013 to improve the likelihood of establishing offshore spawning stocks in West and East Greenland. ICES' advice for the inshore cod is based on the precautionary approach (there is no management plan for the Greenland inshore cod).
Faroe Bank ICES Vb2	Fishery closed	Zero catch	Landings and survey indices are used to indicate stock trends, which remains severely depleted. ICES has advised since 2008 that the fishery should be closed to all fisheries until the stock recovers. The Bank has been closed to fishing since 1 January 2009, though small line fishers (<15 BRT) were allowed a total of 100 fishing days in 2011.

Table 1: Management Stock (colour keyed to Fig. 4 on page 8)	Agreed TAC 2013 (t) (8)	Advisory TAC 2013 (t)	Scientific advice and management (June 2012 ICES advice) (7)
Norwegian Coastal ICES I and II	Included in Arctic stock	Fishing effort control	The assessment indicates trends only, and no reference points are defined. Recruitment has remained low since 2002, and SSB appears to be close to its lowest historic level. Fishing mortality has been relatively stable since 2000. A rebuilding plan agreed by the Norwegian authorities is considered by ICES to be provisionally consistent with the precautionary approach, and is the basis for ICES advice. If the spawning-stock index in the 2012 autumn survey is lower than the index in 2011, the fisheries regulations should aim at a reduction of F in 2013 of at least 30% relative to 2009. If the survey index is higher than in 2011, the measures taken in 2012 should continue in 2013.

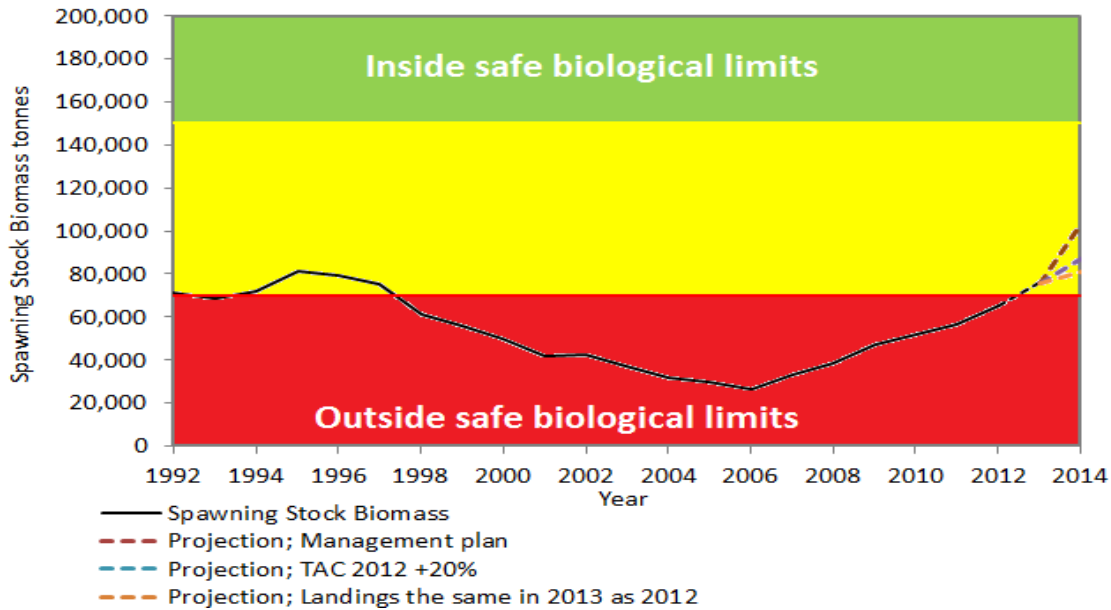
Stock Trajectories - North Sea Cod

Figure 2. Fishing mortality trajectory for North Sea cod (North Sea and Skagerrak IV, VIId, IIIa), ICES 2012 assessment.



The fishing mortality rate has been outside safe biological limits (above F_{lim} , see Fig. 1) for most of the period since the 1970s, but has recently shown a decline and is now just inside precautionary levels. Though this indicates a low probability (less 5-10%) of fishing mortality being above F_{lim} (outside safe biological limits), the management plan aims for a fishing mortality of 0.4 (brown line), and fishing this stock at Maximum Sustainable Yield (F_{MSY}) would imply a fishing mortality of 0.19 (blue line).

Figure 3: Spawning Stock Biomass trajectory North Sea cod (North Sea and Skagerrak IV, VIId, IIIa), ICES 2012 assessment.



MSY_{Btrigger} and B_{pa} are at 150,000 t and safe biological limit (B_{lim}) is at 70,000 t. Three projections (dotted) beyond 2012 are shown. One is based on the management plan, which called for a decrease in TAC of 20% in 2013 compared with 2012 (brown line). The purple line shows the effect of a TAC in 2013 that is 20% above that in 2012 (the agreed TAC in 2013 was approximately 5% higher than in 2012); whilst the orange line assumes the same landings in 2013 as in 2012. The trajectory of the stock is likely to be somewhere between the management plan and the latter projection, which corresponds to a landed catch of 43,000 t, substantially above the agreed TACs for both years. All these projections suggest that the stock will be inside safe biological limits (above B_{lim}) in 2014.

Table 2: Management Stock	Scientific advice and management
NORTHWEST ATLANTIC WATERS www.nafo.int for international waters, ref. 12 for Canadian waters, ref. 13 for American waters	
See Figure 4 on page 8	
Reference points not fully defined	
Flemish Cap (3M), Grand Banks (3N,O), N&S Newfoundland (2J, 3KL,3Ps), S Scotia Shelf and Bay of Fundy (4X, 5Yb), N Scotia Shelf (4Vs,W), N&S Gulf of St Lawrence (4T,Vn, 3Pn, 4Rs), Gulf of Maine, (5Y) Georges Bank (5Z)	These stocks used to yield more than 100,000t per annum until the early 1990s, when stock collapse resulted in a moratorium on fishing imposed from 1993-97. Recovery plans are in force or are being developed for most stocks, but many stocks have shown no signs of recovery or remain outside safe biological limits. Only the South Newfoundland and Flemish Cap stocks have recently improved. Despite scientific advice of no direct fishery and zero catches for most stocks, managers have set TACs for some, with a total of around 20,000 t available in 2012 (14).

Figure 4: Management stocks of Atlantic cod (colour keyed to Tables 1 and 2)

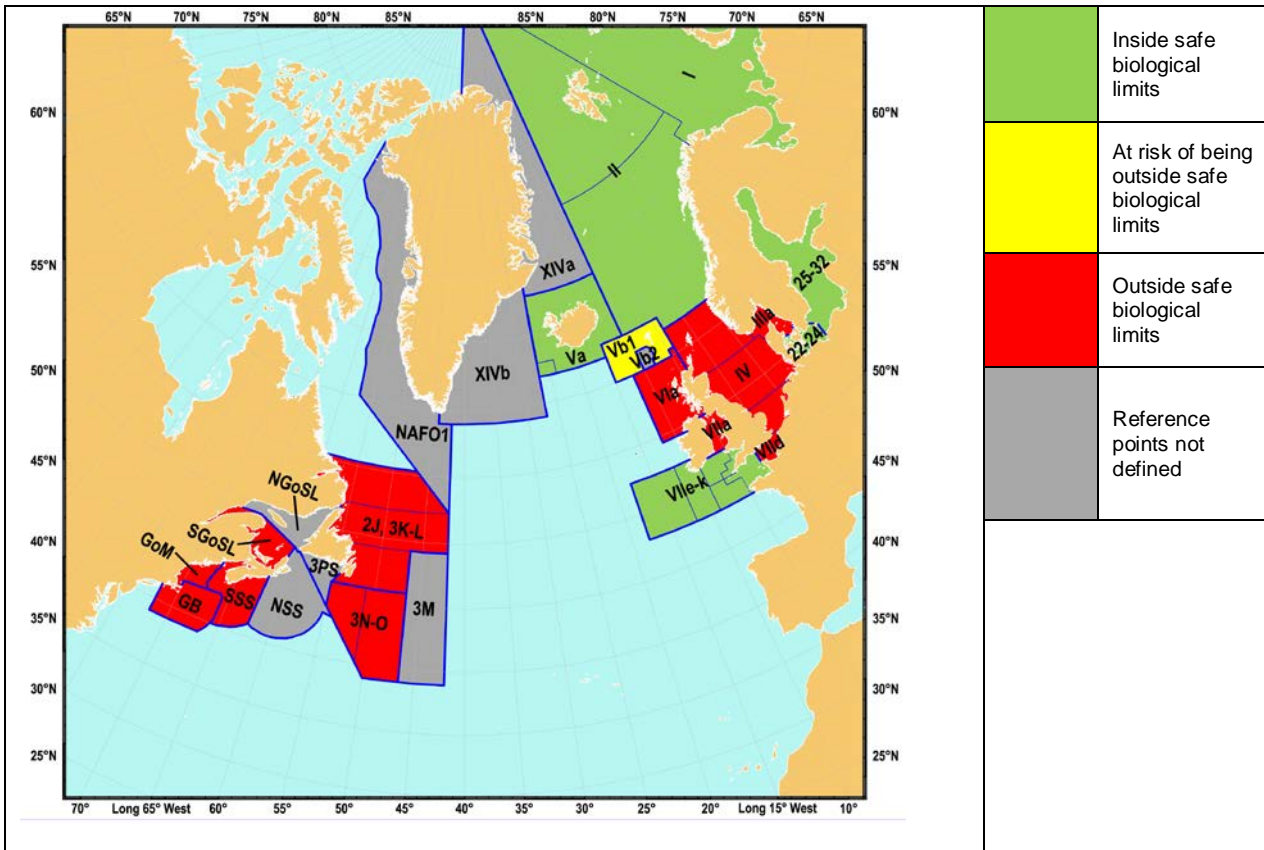
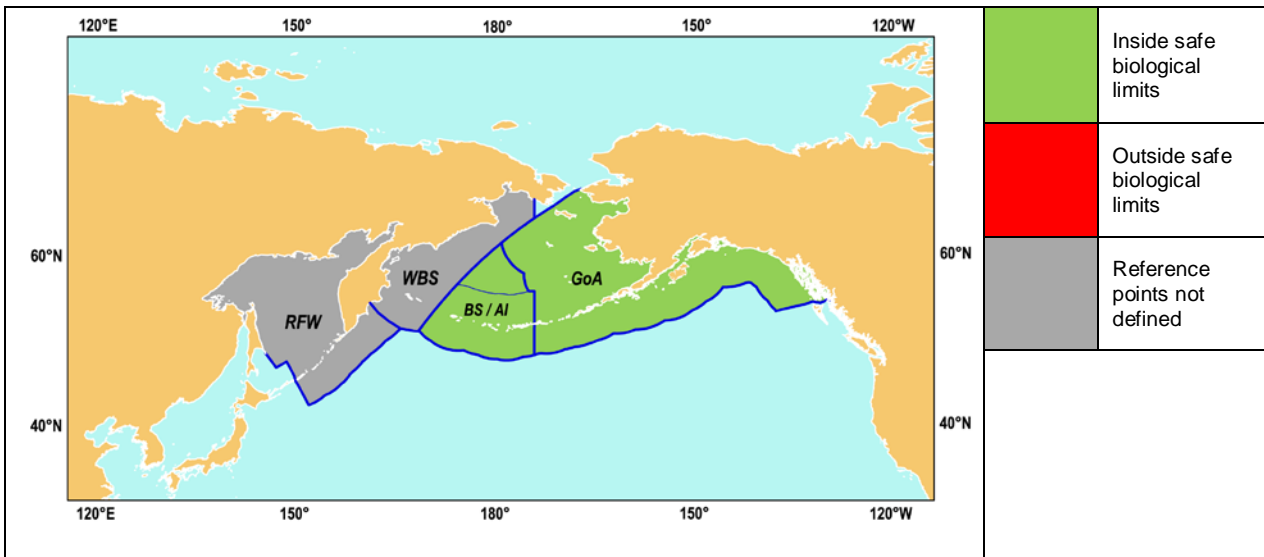


Table 3: Management Stock	Agreed TAC 2013(t)	Scientific advice and management
PACIFIC COD STOCKS (<i>Gadus macrocephalus</i>) (15) See Figure 5 below		
Inside safe biological limits		
Bering Sea & Aleutian Islands BS/AI	260,000	The BS cod contribute the major part of SSB in this stock complex, and has continued to increase whilst the AI component has declined. In 2012 the combined SSB had declined to around the biomass target. MSY is not defined (16).
Gulf of Alaska	<80,800	Recent recruitment has been good and, following a continuous decline between 1982 and 2008, SSB has increased to be above the level that would sustain maximum yields. Though the stock is assessed as not being subject to overfishing, recent TACs have been set below the advised Allowable Biological Catch. The projections for 2013 indicate an ABC of 80,800 t (17).

Table 3: Management Stock	Agreed TAC 2013(t)	Scientific advice and management
Reference points not defined		
West Bering Sea; Russian Fed waters (RFW)	97,960 (2012)	Following catches at a stable level around 40-60,000 t in the early 1990s, stock production appears to have fallen and catches have remained mostly stable at a lower level between 18-29,000 t, even though the stock has increased in size in some areas (14). Management and assessment are under the Russian Federal State Commission of Fisheries (18).

Figure 5: Management stocks of Pacific cod (colour keyed to Table 3 above)



Organisation key

FAO: Food and Agriculture Organisation of the United Nations. Acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy.

EU: The European Union manages fisheries within European Economic Zones and in cooperation with Norway for certain stocks.

NPFMC: North Pacific Fisheries Management Commission. Responsible for assessment and management of North Pacific fish stocks within American Exclusive Economic Zone.

ICES: International Council for the Exploration of the Sea. Responsible for providing scientific advice for North East Atlantic fishery management.

JRNC: Joint Russian Norwegian Commission for fisheries. Responsible for management of fisheries resources off North Norway and Atlantic Russia.

NAFO: Northwest Atlantic Fisheries Organisation. Provides science and management in northwest Atlantic international waters.

Management and conservation measures

Cod can live for up to 25-30 years and a healthy stock is one that has an adequate number of mature year classes, which form a 'buffer' against adverse conditions and lead to more consistent yields. The main determinants of cod stock status are fishing mortality and environmental conditions. Fisheries managers' efforts are focussed on control of fishing mortality and gear selectivity, aiming towards a rate of exploitation which yields MSY from a stable stock, taking account of the fishes' response to changes in environmental conditions.

Environmental factors

Much research effort has been invested into the links between cod biology and environmental factors (19), though the processes that cause good and bad recruitment of young cod are still not clearly understood. The age and abundance of the spawners; the production of plankton for the larvae to feed on and the level of predation are all likely factors (20,21). Whilst the age and abundance of spawners is likely to be heavily influenced by fishing pressure, production of plankton and the presence of predators are likely to vary with climatic conditions. Recruitment, growth, condition and migrations of cod are likely to be heavily influenced by factors such as temperature and food supply, which are affected by environmental conditions.

Because marine productivity is heavily reliant on plankton production, which is controlled by hydrographic conditions, these can have profound effects on marine ecosystems and hence productivity of cod stocks. Changes in the climate affect temperature, wind fields, hydrological systems etc, and operate at annual to decadal scales.

Overlaid on this climate variability are changes in temperature and current systems due to ocean warming and cooling due to longer term climatic factors, which may lead to 'regime shifts'. There are also changes due to fishing, with consequent effects on spawning stock biomass and ecosystems.

Mixed fisheries

Cod are often caught together with haddock in mixed demersal fisheries using predominantly trawls. The status of these species within a given fishery may vary; current examples are the North Sea fishery, where the haddock stock is inside safe biological limits, whilst the cod stock is outside safe biological limits; and the Icelandic fishery where the cod stock is inside safe biological limits but the haddock stock is at risk. The challenge for mixed fisheries management is to enable the sustainable exploitation of these various stocks.

European cod fisheries

The North Sea and Skagerrak, Kattegat, Eastern Channel, West of Scotland and Irish Sea cod stocks are subject to a long-term management plan (10) with target levels of fishing mortality. Member States are empowered to provide incentives through additional fishing effort allowances to

vessels which participate in good fishing practices aimed at reducing fishing's impact on the environment and conservation of cod.

Examples of these practices:

1. Real time closures

One example of these practices is the 'real time' closure scheme in the North Sea (22,23,24). Data from catches and tracking information are used to identify areas that can be closed to fishing in order to reduce mortality on concentrations of cod, and juvenile cod, haddock, whiting and saithe, through. Although more efforts to reduce cod mortality to the agreed level are required in the longer term, this scheme represents a substantial advance and has resulted in good co-operation between government and industry.

2. Catch Quota Scheme

In order to reduce the high level of discarding that occurs as a result of the exhaustion of quota for cod, and to control total mortality, the English (24) and Scottish (25) governments have introduced catch quota trial schemes accounting for 24% of the landings in 2011. Participating vessels use independent electronic monitoring devices (video recordings which monitor fishing activities using sensors) to ensure that all caught fish are recorded, and all caught cod are retained onboard, landed and count against quota (including undersized fish). In return, these vessels are allowed additional quota and days at sea, though they have to stop fishing when they use up their quota. By this means the total mortality on the cod stock is capped, wasteful discarding is reduced, and improved information on catches is available. Moreover, there is more flexibility for fishermen to use the additional days at sea up to the point when they run out of quota, and there is an incentive to use more selective gear in order to target more marketable fish. If successful, the scheme may be expanded to other species.

Baltic fishery

The EU has implemented a recovery programme for the Baltic cod fishery with restrictive TACs, restrictions on fishing effort, improved gear selectivity and closed areas and seasons (9). This is considered to have had a desirable effect on the Baltic stock of cod (26) in reducing fishing mortality, with a beneficial increase in spawning stock biomass.

Scandinavian fisheries management

There is a ban on cod discards in Iceland (27), Faroe and Norway (11) waters. Fisheries operate on a minimum capture size, setting the selectivity of the gear so that a very small proportion of fish smaller than this size are caught. There are also 'real time' monitoring systems in place in which areas are closed where the quantity of small fish exceeds a pre-set amount.

The Faroese management scheme relies heavily on effort limitation, but they also have gear restrictions and temporary and seasonal closures. However, the Faroese Government and fishing industry recognise that further action is necessary to reduce fishing mortality to the levels recommended by ICES, and are actively working towards that end.

Product characteristics and seasonal cycles

Cod is a demersal whitefish species that ranges in size from around 500 g to over 20 kg. It has a long, tapered body with a mixture of sandy-browns, greyish-greens and darker speckles. Yields of filet from gutted fish are approximately 34% (29).

Cod undergo a seasonal spawning cycle which causes the condition and quality of the cod to vary (see below and references 28, 30). The timing and extent of variation depends on the stock and can vary from year to year, so local knowledge is important.

	J	F	M	A	M	J	J	A	S	O	N	D
North Pacific												
Bering Sea & Aleutian Islands												
Gulf of Alaska												
West Bering Sea												
North East Atlantic												
Faroe												
Northeast Arctic cod												
Southeast Baltic												
Central Baltic												
North Sea and Skagerrak												
Irish Sea												
West of Scotland												
Area Seven												
Iceland												
Greenland												
	Spawning					Peak spawning						

Supply chain standards

Responsible practice in the chilled and frozen supply chain depends on correct catching, gutting, washing, chilling or freezing, processing and handling practices throughout the chain. There are standards which cover these aspects from capture to retailer:

- **Seafish Responsible Fishing Scheme.** Sets best practice standards for fishing vessels, based on British Standards Institution specifications (BSi: PAS 72:2006) (31);
- **British Retail Consortium (BRC) Global Standard & Safe & Local Supplier Approval (SALSA) certification.** Designed to raise standards in the seafood processing and wholesaling sectors.

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For further guides see: <http://tinyurl.com/seafishrsg>

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REFERENCES

1. www.fao.org/fishery/en
 2. www.marinemangement.org.uk/fisheries/statistics/documents/ukseafish/2011/final.pdf
 3. Seafish statistics
 - 3a. www.food.gov.uk/foodindustry/guidancenotes/labelregsguidance/fishlabellingregs2010eng
 4. www.bmfauk.com
 5. www.msc.org
 6. www.seafish.org/media/Publications/SeafishGuidanceNote_MaximumSustainableYield_201103.pdf
 7. www.ices.dk/advice/icesadvice.asp
 8. *Council Regulations (EC) No 39/2013, 40/2013 and No 1088/2012 and Agreed Record of Fisheries Consultations between the European Union and Norway for 2013.
 9. *(EC) No 1098/2007.
 10. *(EC) No 1342/2008.
 11. www.fisheries.no/marine_stocks/fish_stocks
 12. www.dfo-mpo.gc.ca/csas/csas/Publications/Pub_Index_e.htm
 13. www.nefmc.org
 14. www.fishsource.org
 15. www.fakr.noaa.gov/npfmc
 16. www.fakr.noaa.gov/npfmc/PDFdocuments/cat_ch_shares/PCod/BS-AlpcodABC-TACsplit413.pdf
 17. www.afsc.noaa.gov/REFM/Docs/2012/GOAp_cod.pdf
 18. http://www.traffic.org/fisheries-reports/traffic_pub_fisheries5.pdf
 19. www.ices.dk/globec
 20. Scott B. E et al (2006) Ecological Modelling 191; 385-415.
 21. Beaugrand, G et al (2003) Nature Vol. 426, no. 6967, pp. 661-664.
 22. www.scotland.gov.uk/Topics/marine/Sea-Fisheries/17681/closures
 23. www.marinemangement.org.uk/fisheries/monitoring/closures.htm
 24. www.marinemangement.org.uk/fisheries/monitoring/documents/cgt_interim.pdf
 25. www.scotland.gov.uk/Topics/marine/Sea-Fisheries/17681/catchquota
 26. Cardinale and Svedang (2011) Mar Ecol Prog series 425; 297-301
 27. www.fisheries.is
 28. ICES Coop Res Report No. 274: 2005.
 29. www.fao.org/docrep/003/T0219E/T0219E00.HTM
 30. www.fishbase.org
 31. www.seafish.org/sea/fishing/RFS
- *European legislation available on: <http://europa.eu/>