6.4.2 Cod in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak)

State of the stock

Spawning biomass in relation to precautionary limits	Fishing mortality in relation to precautionary limits	Fishing mortality in relation to highest yield	Fishing mortality in relation to agreed target	Comment
Reduced reproductive capacity	Harvested sustainably	Overfished	Above target	

Based on the most recent estimate of SSB (in 2008) and fishing mortality (in 2007), ICES classifies the stock as suffering reduced reproductive capacity and as being harvested sustainably. The general perception of cod abundance remains unchanged, with a historical low in 2006. SSB has shown an increase since then but remains below B_{lim}. Fishing mortality has shown a decline since 2000, and is currently estimated to be just below F_{pa}. The 1997–2006 year classes are all estimated to have been well below average. The 2005 year class is estimated to be one of the most abundant amongst the recent below-average year classes.

Management objectives

Two management agreements are applicable (for details see Annex 6.4.2): The EU–Norway agreement management plan has the main objective of keeping SSB above 70 000 tonnes (B_{lim}), and reducing fishing mortality to 0.4. In addition the EU has adopted a recovery plan for this stock (Council Regulation (EC) 423/2004) with the aim to increase the SSB by 30% per year to B_{pa}. The European Commission has adopted a proposal in April 2008 to amend the EU cod recovery plan (COM(2008) 162 final).

ICES has previously concluded that a recovery plan, in order to be precautionary, must include an adaptive element, implying that fisheries for cod remain closed until an initial recovery of the cod SSB has been proven. Such an element is not included in the existing plan. ICES therefore considers the EU recovery plan as not consistent with the precautionary approach.

Reference points

	Type	**Value**	**Technical basis**
Precautionary approach	B_{lim}	70 000 t	B_{loss} (~1995)
	B_{pa}	150 000 t	B_{pa} = Previous MBAL and signs of impaired recruitment below 150 000 t.
	F_{lim}	0.86	$F_{lim} = F_{loss}$ (~1995)
	F_{pa}	0.65	F_{pa} = Approx. 5th percentile of F_{loss}, implying an equilibrium biomass > B_{pa}.
Targets	F_{HCR}	0.4	EU–Norway agreement

(unchanged since 1998)

Yield and spawning biomass per Recruit F-reference points:

	Fish Mort Ages 2–4	Yield/R	SSB/R
Average last 3 years	0.75		
F_{max}	0.20	0.6	2.8
$F_{0.1}$	0.13	0.6	4.1
F_{med}	0.79	0.4	0.3

Reference points estimated by ICES in 2004

In 2005, ICES has advised that, on the basis of evaluations of harvest control rules for North Sea cod, target fishing mortalities (covering all catches) below 0.4 (ages 2–4) would result in a low risk of SSB falling below the conservation limit B_{lim} and would achieve high long-term yields.

Single-stock exploitation boundaries

Exploitation boundaries in relation to existing management plans

SSB_{2008} is below B_{lim}. However, SSB_{2009} can reach B_{lim} with a 50% probability under the assumption that F_{2008} is 90% of F_{2007}. Under these circumstances, the EU recovery plan stipulates that the following criteria be met, in order of increasing priority:

(a) TAC_{2009} should not exceed a level that results in SSB_{2010} being 30% above SSB_{2009};
(b) There should be no more than a 15% change from TAC_{2008} to TAC_{2009};
(c) F_{2009} should not exceed F_{pa}.

These criteria imply invoking the TAC constraint $TAC_{2009} = 1.15 \times TAC_{2008}$, which corresponds to a TAC in 2009 of 29 100 t for Area IV and Subdivisions VIId and IIIa (Skagerrak).

The EU–Norway agreement stipulates that:

(a) Every effort shall be made to maintain SSB above B_{lim};
(b) If SSB > B_{pa} the TAC shall be set at the level achieved at F = 0.4, with a ±15% constraint on annual change;
(c) If SSB < B_{pa} the TAC shall be set lower than that achieved through a) and b).

These criteria imply a TAC in 2009 of less than 29 100 t ($TAC_{2009} = 1.15 \times TAC_{2008}$) for Area IV and Subdivisions VIId and IIIa (Skagerrak).

Exploitation boundaries in relation to high long-term yield, low risk of depletion of production potential and considering ecosystem effects

F_{2007} is above the levels that would lead to high long-term yield and low risk of depletion of production potential, taking ecosystem effects into account.

Exploitation boundaries in relation to precautionary limits

Given the low stock size and recent poor recruitment, the stock cannot be rebuilt to B_{pa} at the start of 2010 even with a zero catch. However, simulations indicate that with the recent poor recruitment, a zero catch in 2009 and 2010 is likely to achieve the rebuilding of the stock to B_{pa} by 2011.

Conclusion on exploitation boundaries

Because the existing recovery plan is not considered to be in accordance with the precautionary approach, ICES continues to advise on exploitation boundaries in relation to precautionary limits, and recommends that the fisheries for cod be closed until an initial recovery of the cod SSB has been proven.

Short-term implications

Basis: F_{08} = 0.9 F_{07} = 0.58; $R_{07\text{-}09}$ = median of 1997–2006 YC ~130 million; SSB(2009) = 70.7; Landings (2008) = 38.8; Discards (2008) = 25.2.

Rationale	Landings (2009) [3]	Basis	F total (2009)	F land (2009)	F disc (2009)	Discards (2009)	SSB (2010)	%SSB change[1]	%TAC change[2]
Zero Catch	0	F=0	0	0	0	0	141.9	+101%	-100%
EU Recovery Plan / EU–Norway agreement	29.1	1.15 TAC_{08} (0.57 F_{08})	0.33	0.20	0.13	16.6	102.1	+44%	+15%
Status quo options	34.3	0.69 F_{08}	0.40	0.25	0.15	19.7	95.0	+34%	+35%
	36.4	0.75 F_{08}	0.43	0.27	0.17	21.0	92.1	+30%	+44%
	38.3	0.80 F_{08}	0.46	0.29	0.18	22.2	89.5	+27%	+51%
	40.2	0.85 F_{08}	0.49	0.30	0.19	23.3	86.9	+23%	+59%
	42.0	0.90 F_{08}	0.52	0.32	0.20	24.4	84.6	+20%	+66%
	45.5	F_{08}	0.58	0.36	0.22	26.5	79.6	+13%	+80%

Weights in '000 t. Shaded areas are not considered consistent with the precautionary approach.

[1] %SSB change: 2010 relative to 2009.

[2] %TAC change: 2009 relative to 2008 (TAC for Skagerrak + TAC for IV; EC waters of IIa; that part of IIIa not covered by the Skagerrak and Kattegat (Total = 25 317 t)).

[3] Landings apply to Subarea IV and Divisions IIIa and VIId and are calculated as 83%, 13%, and 5% of the combined area total (average proportion of the official landings over the last three years).

Management considerations

In the past years, emergency measures have been taken and an EU recovery plan implemented with the aim of reversing the declining trend in SSB and increasing the spawning stock above B_{lim}. These measures have contributed to a reduction in fishing mortality and a moderate increase in SSB.

This year's advice is consistent with that of May 2007 in noting that B_{pa} cannot be achieved in two years even with a zero catch. The October 2007 advice showed a more optimistic view, stating that despite the low stock size and recent poor recruitment, the stock could be rebuilt to B_{pa} in two years with a very low fishing mortality. The difference between the two evaluations results from the interpretation of achieving B_{pa} at the end of the forecast year. In each case SSB is forecast to increase to close to B_{pa} following two years of low mortality rates. The forecast of October 2007 estimated SSB just above B_{pa} even with a small catch, and the most recent forecast indicates that SSB will be just below B_{pa}. The advice is therefore for zero catch.

The 2007 advice also noted that if the total mortality resulting from fishing were reduced to low levels, the SSB would rebuild rapidly. Whilst human consumption fishing mortality declined in 2007, discarding has increased and is at a level equivalent to the landings. Continued fishing and discard mortality in 2008 and 2009 at the level seen in 2007 is expected to stabilize the SSB at around B_{lim}, but will not lead to a substantial increase.

Surveys have indicated that the year classes were depleting faster than one would expect from the level of recorded catches and pointed to unaccounted removals, e.g. additional discards, mis- and underreporting of catches. A model which estimates catch was therefore applied to estimate the stock and fishery dynamics. Unaccounted removals are estimated to have declined in recent years and are considered to be a negligible factor in determining the short-term dynamics of the stock compared to landings and discard mortality; this is consistent with anecdotal information. Therefore the fishery-induced mortality used for the forecast only includes landings and discards.

It is necessary to reduce mortality especially on younger ages of cod, to allow more fish to reach maturity and increase the probability of good recruitment. In the last five years, an average of 82% (84% in 2007) of the international landings in numbers consisted of juvenile cod aged 1–3. Because the fishery is at present so dependent on incoming year classes, fishing mortalities on these year classes is high, and only 12% of the 2-year-olds currently survive to maturity (compared to 22% in the early 1960s).

The recruitment of the relatively more abundant 2005 year class to the fishery may have no beneficial effect on the stock if it is caught and heavily discarded. In 2006, the 2005 year class comprised 62% of the total catch by number, and in 2007 it comprised 55%. Discarding of this year class has increased to 40% in 2007 and is expected to remain high in 2008. The last substantial year class to enter the fishery was the 1996 year class. This year class was a

prominent feature in all surveys, was heavily exploited and discarded by the fishery at ages 1–5, and disappeared relatively quickly from the fishery with no benefit to the SSB. Recent measures to improve the survival of young cod such as the Scottish Credit Conservation Scheme, and the increased uptake of more selective gear in the North Sea and Skagerrak such as the Eliminator Trawl (Holst and Revill, 2008), should be encouraged.

French fishers have been reporting substantial discards of undersize cod in the eastern Channel (VIId) in 2007 and early 2008. Relatively large numbers of the 2006 year class were first observed as 0-group fish in several surveys in the eastern Channel and southern North Sea. This year class has been observed again in large numbers as age 1 fish in the French groundfish survey in the eastern Channel, and by French fishers targeting cuttlefish in this area. This appears to be a localized phenomenon as the 2006 year class is estimated to be poor in the North Sea, based on the IBTS Q1 and Q3 surveys.

Several nations who make substantial landings of cod do not supply the WG with estimates of discards, despite the requirement to do so according to EU data collection regulations. In order to improve the quality of the assessment, and hence management advice, these nations should be encouraged to do so.

Cod are taken by towed gears in mixed demersal fisheries, which include haddock, whiting, *Nephrops*, plaice, and sole. They are also taken in directed fisheries using fixed gears. Mixed fishery advice is further elaborated in Section 6.3.

Cod catch in Division VIId is managed by a TAC for Divisions VIIb–k and Subareas VIII, IX, X, and CECAF 34.1.1 (i.e. the TAC covers a small proportion of the North Sea cod stock together with cod in Divisions VIIe–k). Cod taken in Division VIId should be included in the North Sea cod TAC. Recent information from surveys and fishers on the 2006 year class, which was abundant in the southern North Sea and subsequently in Division VIId, highlights the linkage.

ICES is currently developing a generic approach to evaluate whether new information that becomes available after the advice is released would form a basis to update the advice. The approach will be based on a statistical evaluation of the information content of that information (e.g. new survey information). The generic approach is expected to be finalized in September 2008.

Management plan evaluations

The European Commission has proposed to amend the EU cod recovery plan (COM(2008) 162 final). ICES has been asked to consider if this proposal can be evaluated during 2008.

Impacts of fisheries on the ecosystems

Cod is targeted by a gillnet fishery, primarily conducted by Denmark and the UK, with a substantive bycatch of harbour porpoise. In 2001 the total bycatch in the cod fishery was around 2000 porpoises. Since 2001, effort reductions in this fishery have likely led to decreased bycatches of porpoises.

The effect on the benthic invertebrate community in the northern North Sea from all otter trawling is estimated to represent an annual mortality of approximately 25% of the standing-crop biomass. The MAFCONS and STECF data set suggest that otter trawl effort directed at fish has declined since 1999 (Greenstreet *et al.*, 2007).

Factors affecting the fisheries and the stock

Regulations and their effects

Spatial management has been attempted for cod, both in the form of a closure of a large area of the North Sea in 2001 (Council Regulation (EC) 259/2001) and through implementation of a cod protection area in 2004 (EC 2287/2003). Neither of these measures appeared to have had the desired effect and both were abandoned shortly after implementation.

In 2001, cod in the whole of NEAFC region 2 was a legitimate target species for towed gears with a minimum codend mesh size of 100 mm. As part of the cod recovery measures, the EU and Norway introduced additional technical measures from 1 January 2002 (EC 2056/2001). The basic minimum mesh size for towed gears for cod, apart from some transitional arrangements, has been 120 mm from 2002.

Effort restrictions in the EC were introduced in 2003 (EC 2341/2002, Annex XVII, amended in EC 671/2003). Effort restriction measures were revised for 2004 (EC 2287/2003, Annex V). Preliminary analysis of fishing effort trends in the major fleets exploiting North Sea cod indicates that fishing effort in those fleets has been decreasing since the mid-1990s due to a combination of decommissioning and days-at-sea regulations. The decrease in effort is most pronounced

in the years 2002 and beyond. Fishing mortality in recent years has been declining simultaneously with a reduction in effort.
Changes in effort regulations for 2008 in days-at-sea per vessel and gear category (EC 40/2008) are intended to generate a cut in effort of 10% for the main gears catching cod. Additional provisions have been introduced for 2008 (points 8.5–7, Annex IIa, EC 40/2008) to provide Member States greater flexibility in managing their fleets. These provisions allow Member States to draw up fishing plans in collaboration with the fishing industry, which could, for example, specify a target to reduce cod discards to below 10% of the cod catch, allow real-time closures for juveniles and spawners, implement cod avoidance measures, trial new selective devices, etc.

Incentives of up to 12 additional days-at-sea per vessel are in place for 2008 to encourage vessels to sign up to a Discard Reduction Plan (points 12.9–10, Annex IIa, EC 40/2008). For vessels participating in a Cod Avoidance Reference Fleet Programme in 2008 (points 12.11–14, Annex IIa, EC 40/2008), a further 10–12 additional days-at-sea is possible (over and above that for the Discard Reduction Plan).

Scotland has implemented a national scheme known as the 'Conservation Credits Scheme'. The principle of this two-part scheme involves additional time at sea in return for the adoption of measures which reduce mortality on cod and lead to a reduction in discard numbers. The initial, basic scheme was implemented from the beginning of February 2008 and essentially grants vessels their 2007 allocation of time at sea in return for: observance of Real Time Closures (RTC), observance of a one-net rule, adoption of more selective gears, agreeing to participate in additional gear trials, and participation in an enhanced observer scheme.

A new rights-based regulation (FKA – Vessel Quota Share) was put in force in Denmark from the 1st January 2007. With the new system, individual vessels are allocated a yearly share of the Danish quota, which can be taken at any time of the year. There is also a possibility to trade it, exchange it, or pool it with other fishers. The old regulation had a system with 14-day quotas, which continuously adjusted to the amount of national quota left. The new system gives the industry a possibility to plan better and is expected to lead to a more efficient fishery with less discards.

Changes in fishing technology and fishing patterns

The expected benefits from the increase in mesh size to 120 mm are not apparent from the available data. The effect of this increase is confounded by the transfer of effort from the fleets fishing with mesh sizes >120 mm to fleets fishing with mesh sizes between 70 and 99 mm, i.e. fishing for *Nephrops*. The regulation differentiates between the number of fishing days allowed when fishing for *Nephrops* or when fishing for other demersal species (>120 mm). Fishing for *Nephrops* with the smaller mesh allowed more days at sea than fishing with larger meshes.

Information presented to ICES indicated that the UK large mesh demersal trawl fleet category (>100 mm, Division IVa) has, in 2005, been reduced by decommissioning and days-at-sea regulations to 40% of the levels recorded in the EU reference year of 2001. There was a movement into the 70–90 mm sector to increase days at sea in 2002 and 2003, but the level of effort stabilized in 2004.

The introduction of the one-net rule as part of the Scottish Conservation Credit Scheme is likely to improve the accuracy of reporting of metier-based landings. Scottish legislation implemented in January 2008, banning the use of multi-rigs (>2 rigs per trawl), could limit the potential of uncontrolled increase in effort.

There has been a move in Scottish vessels from using 100–110 mm for whitefish on west coast ground (Subarea VI) to the North Sea using 80 mm prawn codends, which could imply increased discarding.

A move from the Farn Deeps *Nephrops* fishery into other fisheries for whitefish because of poor *Nephrops* catch rates, implies increased effort in whitefish fisheries.

For 2008 in the Scottish fleet, all twin-rig *Nephrops* gear in the 80–99 mm category must use a square mesh panel. This will also apply to single-rig gears from July 2008 onwards, which should improve whitefish selection.

The Dutch beam trawl fleet has been reduced, through decommissioning, by 23 vessels from the beginning of 2008, while 5 Belgian beam trawlers (approximately 5% of the Belgian fleet) left the fishery in 2007 (implying reduced effort by beam trawls).

A number of Dutch beam trawlers have gradually shifted to other techniques such as twin trawling, outrigging, and fly-shooting, as well as opting for smaller, multi-purpose vessels (which implies a shift in effort away from flatfish to other sectors).

The increased effort costs in the Kattegat (2.5 days at sea per effort day deployed in first quarter 2008) has led to a shift in effort by Swedish vessels to the Skagerrak and Baltic Sea.

A squid fishery in the Moray Firth continues to develop, using very unselective 40 mm mesh when squid species are available on the grounds. Although the uptake was poor in 2007 due to the lack of squid, the potential for high bycatches of young gadoids in future fisheries, including those of cod and haddock, remains. This fishery may provide an alternative outlet for the Scottish *Nephrops* fleet seasonally, and hence reduce effort in the *Nephrops* sector.

Impacts of the environment on the fish stock

The North Sea has seen a northerly shift in the mean latitudinal distribution of the stock. However, the evidence for this in the form of a migratory response is slight or non-existent. More likely, cod in the North Sea are composed of a complex of more or less isolated sub-stocks and the southern units have been subjected to disproportionately high rates of fishing mortality. The contracted range of the North Sea cod stock can be linked to reduced abundance as well as climate factors.

The consumption of cod in the North Sea in 2002 by grey seals has recently been estimated (Hammond and Grellier, 2006). For the North Sea it was estimated that in 1985 grey seals consumed 4150 tonnes of cod (95% confidence intervals; 2484–5760 tonnes), and in 2002 the population tripled in size (21 000–68 000 individuals) and consumed 8344 tonnes (95% confidence intervals; 5028–14 941 tonnes). Inclusion of the new grey seal diet data and seal population abundance are expected to reduce slightly the historic estimates of cod consumption in the North Sea by seals, generated from a multispecies model previously used. This suggests that the new estimates of seal predation will not alter the current perception of North Sea cod stock dynamics.

Scientific basis

Data and methods

The age-based assessment model (B-ADAPT) used landings and discards, calibrated with two survey indices (from IBTS quarter 1 and quarter 3 surveys). For ICES Subarea IV and Division VIId, discards were estimated from the Scottish discards sampling programme up until 2005 and raised to the total international fleet. For 2006 Denmark provided its own discard estimates. For 2007 Scottish, Danish, German, and England & Wales discard estimates were combined and used to raise landings-at-age for remaining nations in Subarea IV. Discards in Division IIIa were based on observer estimates. For 2006 and 2007, Danish and Swedish discard estimates were combined to raise landings-at-age from the remaining nations in Division IIIa.

The assessment and forecast made use of the 2008 Quarter 1 IBTS survey. Because of unreliable information on landings and effort, commercial indices were not used in the assessment. Instead, the assessment uses only survey data for calibration. Quantities of additional unallocated removals were estimated by the model on the basis of the total mortality indicated by the survey. In addition to the B-ADAPT model a new model (state space model) was used to validate the estimates of unallocated removals. Both models gave similar estimates of catch multiplier. The unallocated removals estimates could potentially include components associated to increased natural mortality and discarding as well as unreported landings. It is, however, assumed that all of these removals originate from fishing activities.

The catch options in the forecast table represent median values from a stochastic forecast. All scenarios assume a 10% reduction in fishing mortality in 2008 to account for a 10% reduction in effort for the main cod gears, as stipulated in EC 40/2008. Landings and discards in the forecast are estimated by applying the landing- and discard-at-age ratios for 2007 to total fishing mortality-at-age for the projection period.

A series of medium-term projections were used to evaluate management scenarios: a reduction in fishing mortality by 10% in 2008 (as a consequence of assuming a 10% decrease in effort in 2008), followed by constant fishing at the 2008 level or a closure from 2009 onwards (Figures 6.4.2.2a and b). The closure option is expected to bring SSB above B_{lim} in 2010 with 95% probability.

Information from the fishing industry

The NSFCP fishers' survey was not available to ICES for the provision of information from fishers on the status of the stock.

In May 2008, French fishers targeting cuttlefish in the eastern Channel reported discards of several tonnes per haul of undersized cod in ICES rectangle 28F0, forcing them to leave their usual cuttlefish fishing area. They reported that this also occurred in 2007. At the time of the WG meeting, the local fishers were gathering additional information to verify these observations. Based upon the preliminary observations of fishers in 2008 and observations during the summer of 2007, it seems undersized cod move westwards into Division VIIe in the spring. Inshore trawlers based in Granville

have reported experiencing, for the first time, recurring bycatches of cod in some areas west of 28F0 during summer 2007. Bycatches of cod have already been reported this year in 28E9.

Uncertainties in assessment and forecast

A large part (approximately 50% in 2007) of the total catch used in the assessment is discards estimated from relatively low sample numbers compared to landings, and through estimation of unallocated mortality rates. Discard information was not available for a major component of the catch in the southern part of the North Sea and in the eastern Channel from French fleets. These are sources of added uncertainty in the assessment.

Comparison with previous assessment and advice:

The fishing mortality for 2006 has been revised upwards by 25% compared to the last assessment (October 2007) while SSB remains at the same level. The assessment and advice are consistent with previous years.

Sources of information

Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, 7–13 May 2008 (ICES CM 2008/ACOM:09).

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Holst, R., and Revill, A. S. 2008. Some new developments in fisheries technology: A trawl designed to protect North Sea cod and a simple statistical method for catch comparison studies. Fisheries Research (submitted).

Table 6.4.2.1 Cod (*gadus morhua*) in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak). Single-stock exploitation boundaries (advice), management, and catch/landings. Landings for each of the three parts of this combined-area assessment, and for all areas combined are given in Table 6.4.2.2.

North Sea (Subarea IV)

Year	ICES Advice	Single-stock exploitation boundaries	Predicted catch corresponding to advice	Predicted catch corresp. to single-stock exploitation boundaries	Agreed TAC	Official landings	ICES landings
1987	SSB recovery; TAC		100–125		175	167	182
1988	70% of F(86); TAC		148		160	142	157
1989	Halt SSB decline; protect juveniles; TAC		124		124	110	116
1990	80% of F (88); TAC		113		105	99	105
1991	70% of effort (89)				100	87	89
1992	70% of effort (89)				100	98	97
1993	70% of effort (89)				101	94	105
1994	Significant effort reduction				102	87	95
1995	Significant effort reduction				120	112	120
1996	80% of F(94) = 0.7		141		130	104	107
1997	80% of F(95) = 0.65		135		115	100	102
1998	F(98) should not exceed F(96)		153		140	114	122
1999	F = 0.60 to rebuild SSB		125		132	80	78
2000	F less than 0.55		< 79		81	62	59
2001	lowest possible catch		0		48.6	42.3	41
2002	lowest possible catch		0		49.3	44.2	44.3
2003	Closure		0		27.3	27.4	NA
2004	Zero catch	Zero catch	0	0	27.3	23.4	NA
2005	Zero catch	Zero catch	0	0	27.3	23.9	NA
2006	Zero catch	Zero catch	0	0	23.2	22.2	NA
2007	Zero catch	Zero catch	0	0	20.0	19.7	NA
2008	Exploitation boundaries in relation to precautionary limits	Total removals less than 22 000 t	< 22	< 22	22.2		
2009	Zero catch	Zero catch	0	0			

Weights in ‘000 t.

Skagerrak (Division IIIa)

Year	ICES Advice	Single-stock exploitation boundaries	Predicted catch corresponding to advice	Predicted catch corresp. to single-stock exploitation boundaries	Agreed TAC[1]	Official landings	ICES landings[1]
1987	$F = F_{max}$		<21		22.5	19.9	20.9
1988	Reduce F				21.5	17.0	16.9
1989	F at F_{med}		<23		20.5	18.7	19.6
1990	F at F_{med}; TAC		21.0		21.0	17.8	18.6
1991	TAC		15.0		15.0	12.1	12.4
1992	70% of F(90)				15.0	14.0	14.8
1993	Precautionary TAC				15.0	14.7	15.3
1994	No long-term gain in increased F + precautionary TAC				15.5	13.3	13.9
1995	If required precautionary TAC; link to North Sea				20.0	12.1	12.1
1996	If required precautionary TAC; link to North Sea				23.0	16.2	16.4
1997	If required precautionary TAC; link to North Sea				16.1	14.9	14.9
1998	If required precautionary TAC; link to North Sea		21.9		20.0	15.3	15.3
1999	F = 0.60 to rebuild SSB		17.9		19.0	11.0	11.0
2000	F less than 0.55		<11.3		11.6	9.3	9.3
2001	lowest possible catch		0		7.0	7.1	7.1
2002	lowest possible catch		0		7.1	7.5	7.5
2003	Closure		0		3.9	3.8	NA
2004	Zero catch	Zero catch	0	0	3.9	3.8	NA
2005	Zero catch	Zero catch	0	0	3.9	3.8	NA
2006	Zero catch	Zero catch	0	0	3.3	3.4	NA
2007	Zero catch	Zero catch	0	0	2.9	2.9	NA
2008	Exploitation boundaries in relation to precautionary limits	Total removals less than 22 000 t	< 22	< 22	3.2		NA
2009	Zero catch	Zero catch	0	0			

Weights in '000 t.
[1)] Norwegian fjords not included.

Eastern Channel (Division VIId)

Year	ICES Advice	Single-stock exploitation boundaries	Predicted catch corresponding to advice	Predicted catch corresp. to single-stock exploitation boundaries	Agreed TAC[1]	Official landings	ICES landings
1987	Not assessed		-		-	9.4	14.2
1988	Precautionary TAC		-		-	10.1	10.7
1989	No increase in F; TAC		10.0[2]		-	n/a	5.5
1990	No increase in F; TAC		9.0[2]		-	n/a	2.8
1991	Precautionary TAC		3.0[2]		-	n/a	1.9
1992	If required, precautionary TAC		5.5[2]		-	2.7	2.7
1993	If TAC required, consider SSB decline		-		-	2.5	2.4
1994	Reduce F+ precautionary TAC				-	2.9	2.9
1995	Significant effort reduction; link to North Sea				-	4.0	4.0
1996	Reference made to North Sea advice				-	3.5	3.5
1997	No advice				-	7.2	7.0
1998	Link to North Sea		4.9		-	8.7	8.6
1999	F = 0.60 to rebuild SSB		4.0		-	n/a	6.9
2000	F less than 0.55		< 2.5		-	3.6	2.3
2001	lowest possible catch		0		-	2.0	1.6
2002	lowest possible catch		0		-	1.6	3.1
2003	Closure		0		-	1.3	NA
2004	Zero catch	Zero catch	0	0	-	0.2	NA
2005	Zero catch	Zero catch	0	0	-	0.7	NA
2006	Zero catch	Zero catch	0	0	-	1.1	NA
2007	Zero catch	Zero catch	0	0	-	1.7	NA
2008	Exploitation boundaries in relation to precautionary limits	Total removals less than 22 000 t	< 22	< 22	-		
2009	Zero catch	Zero catch	0	0	-		

Weights in '000 t.
[1)] Included in TAC for Subarea VII (except Division VIIa).
[2)] Including Division VIIe.

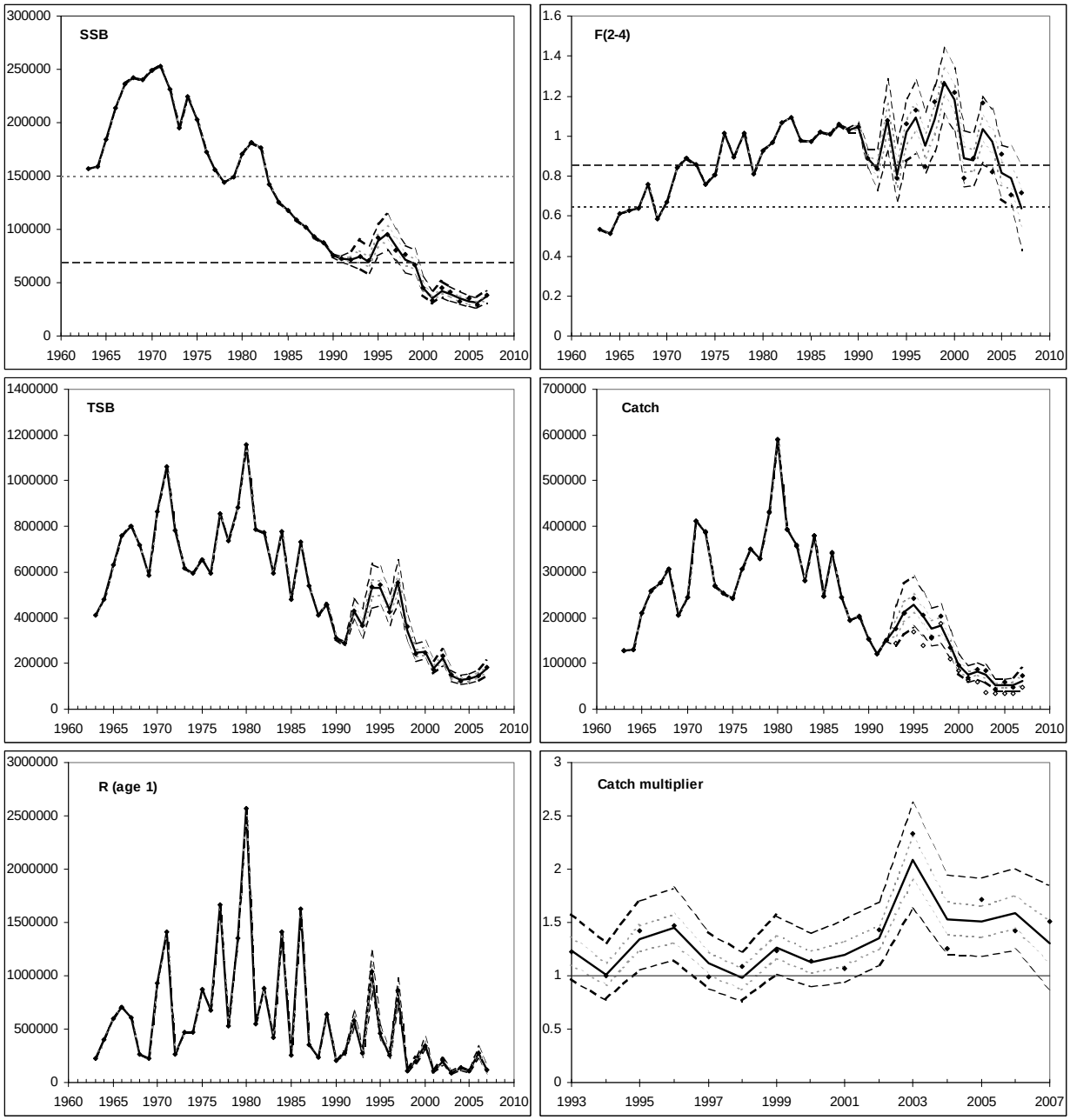

Figure 6.4.2.1 Cod (*gadus morhua*) in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak). Clockwise from top left: percentiles (5,25,50,75,95) of the estimated spawning-stock biomass (SSB), total stock biomass (TSB), recruitment (R(age 1)), and the catch multiplier, catch, and mean fishing mortality for ages 2–4 (F(2–4)) from the B-ADAPT base run. The heavy lines represent the bootstrap median, the light broken lines the 25th and 75th percentiles, and the heavy broken lines the 5th and 95th percentiles. The solid diamonds represent point estimates, and the open diamonds given in the catch plot the recorded total catch. The horizontal broken lines in the SSB plot indicate B_{lim} = 70 000 t and B_{pa} = 150 000 t, and those in the F(2–4) plot F_{pa} = 0.65 and F_{lim} = 0.86. The horizontal solid line in the catch multiplier plot indicates a multiplier of 1. Catch, SSB, and TSB are in tonnes, R is in thousands.

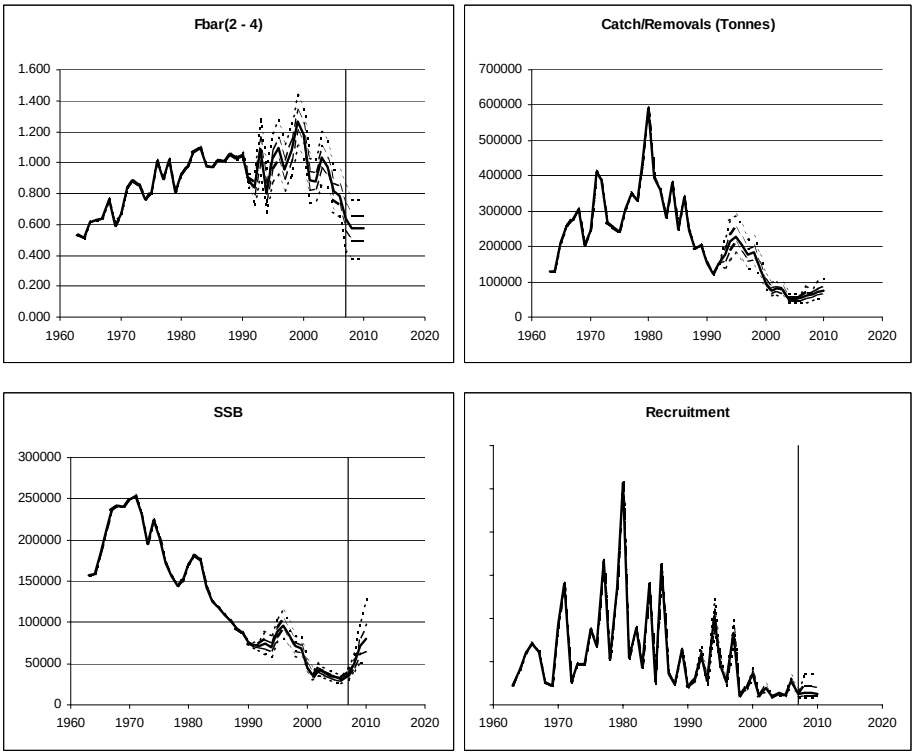

Figure 6.4.2.2a Cod (*gadus morhua*) in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak). B-ADAPT forecast for a reduction in fishing mortality by 10% from 2008, followed by constant fishing mortality at the 2008 level for 2009 onwards. Broken lines represent bootstrap percentiles (5,25,75,95), and the solid trajectory the median.

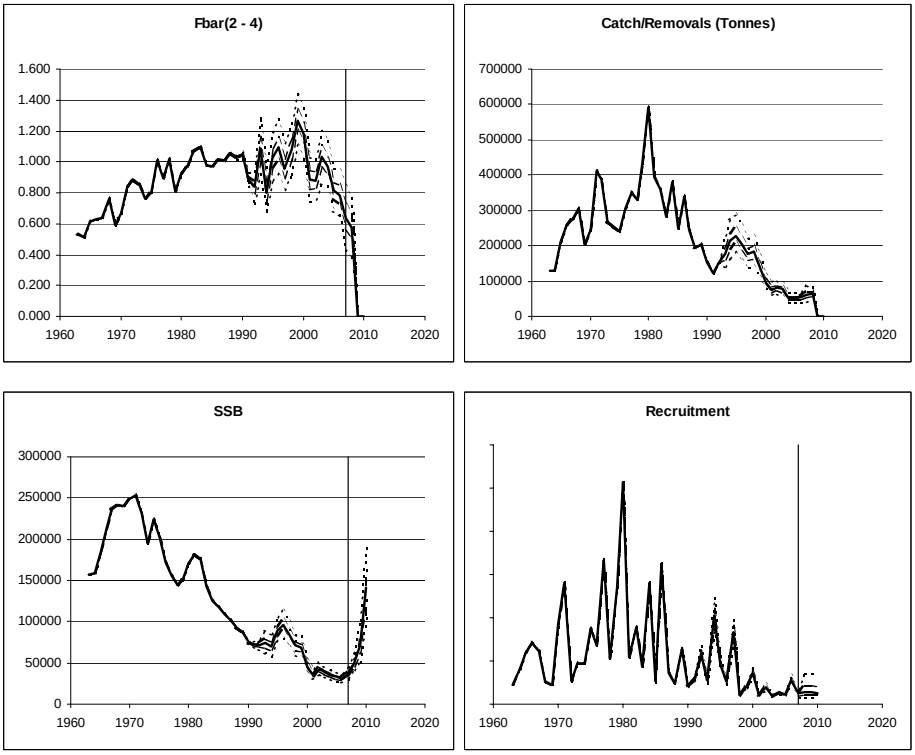

Figure 6.4.2.2b Cod (*gadus morhua*) in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak). B-ADAPT forecast for a reduction in fishing mortality by 10% from 2008, followed by a closure of the fishery for 2009 onwards. Broken lines represent bootstrap percentiles (5,25,75,95), and the solid trajectory the median.

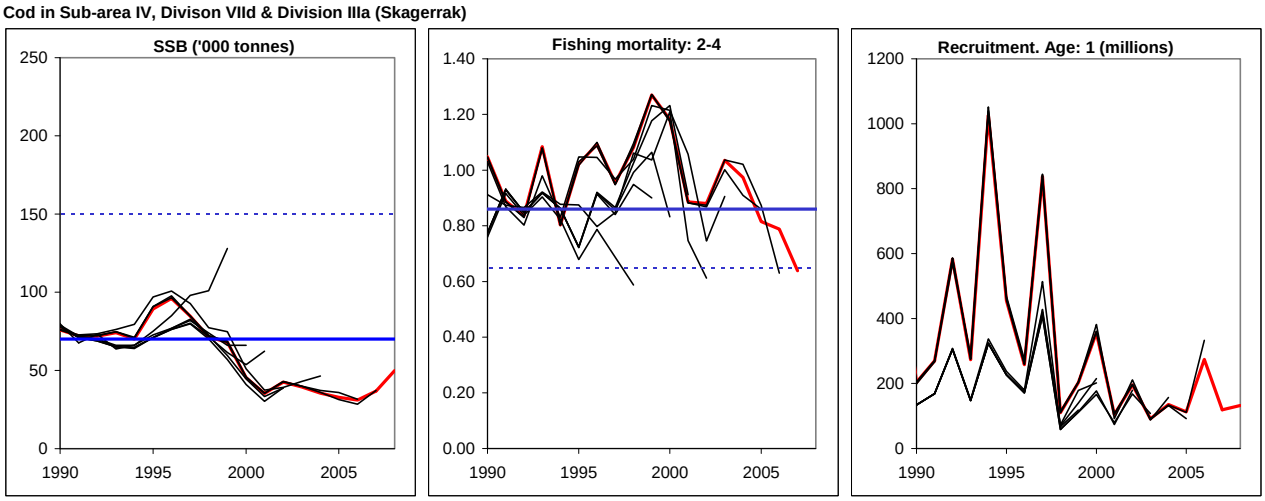

Figure 6.4.2.3 Cod (*gadus morhua*) in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak). Historical performance of the assessment.

Table 6.4.2.2 Cod (*gadus morhua*) in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak). Nominal landings (in tonnes) of COD, 1988–2007, as officially reported to ICES, and as used by the Working Group.

Sub-area IV										
Country	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Belgium	5,508	3,398	2,934	2,331	3,356	3,374	2,648	4,827	3,458	4,642
Denmark	34,905	25,782	21,601	18,998	18,479	19,547	19,243	24,067	23,573	21,870
Faroe Islands	46	35	96	23	109	46	80	219	44	40
France	8,323	2,578	1,641	975	2,146	1,868	1,868	3,040	1,934	3,451
Germany	7,707	11,430	11,725	7,278	8,446	6,800	5,974	9,457	8,344	5,179
Greenland										
Netherlands	16,968	12,028	8,445	6,831	11,133	10,220	6,512	11,199	9,271	11,807
Norway	3,585	4,813	5,168	6,022	10,476	8,742	7,707	7,111	5,869	5,814
Poland	19	24	53	15	-	-	-	-	18	31
Sweden	367	501	620	784	823	646	630	709	617	832
UK (E/W/NI)	23,496	18,375	15,622	14,249	14,462	14,940	13,941	14,991	15,930	13,413
UK (Scotland)	41,382	31,480	31,120	29,060	28,677	28,197	28,854	35,848	35,349	32,344
United Kindom										
Total Nominal Catch	142,306	110,444	99,025	86,566	98,107	94,380	87,457	111,468	104,407	99,423
Unallocated landings	14,253	5,256	5,726	1,967	-758	10,200	7,066	8,555	2,161	2,746
WG estimate of total landings	**156,559**	**115,700**	**104,751**	**88,533**	**97,349**	**104,580**	**94,523**	**120,023**	**106,568**	**102,169**
Agreed TAC	**160,000**	**124,000**	**105,000**	**100,000**	**100,000**	**101,000**	**102,000**	**120,000**	**130,000**	**115,000**

Division VIId										
Country	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Belgium	486	173	237	182	187	157	228	377	321	310
Denmark	+	+	-	-	1	1	9	-	-	-
France	8,795	n/a	n/a	n/a	2,079	1,771	2,338	3,261	2,808	6,387
Netherlands	1	1	-	-	2	-	-	-	+	-
UK (E/W/NI)	867	562	420	341	443	530	312	336	414	478
UK (Scotland)	-	-	7	2	22	2	+	+	4	3
United Kingdom										
Total Nominal Catch	10,149	n/a	n/a	n/a	2,734	2,461	2,887	3,974	3,547	7,178
Unallocated landings	580	-	-	-	-65	-29	-37	-10	-44	-135
WG estimate of total landings	**10,729**	**5,538**	**2,763**	**1,886**	**2,669**	**2,432**	**2,850**	**3,964**	**3,503**	**7,043**

Division IIIa (Skagerrak)										
Country	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Denmark	14,806	16,634	15,788	10,396	11,194	11,997	11,953	8,948	13,573	12,164
Sweden	1,648	1,902	1,694	1,579	2,436	2,574	1,821	2,658	2,208	2,303
Norway	392	256	143	72	270	75	60	169	265	348
Germany	-	12	110	12	-	-	301	200	203	81
Others	106	34	65	12	102	91	25	134	-	-
Norwegian coast *	769	888	846	854	923	909	760	846	748	911
Danish industrial by-catch *	1,103	428	687	953	1,360	511	666	749	676	205
Total Nominal Catch	16,952	18,838	17,800	12,071	14,002	14,737	14,160	12,109	16,249	14,896
Unallocated landings	0	-141	0	-12	0	0	-899	0	0	50
WG estimate of total landings	**16,952**	**18,697**	**17,800**	**12,059**	**14,002**	**14,737**	**13,261**	**12,109**	**16,249**	**14,946**
Agreed TAC	**21,500**	**20,500**	**21,000**	**15,000**	**15,000**	**15,000**	**15,500**	**20,000**	**23,000**	**16,100**

Sub-area IV, Divisions VIId and IIIa (Skagerrak) combined										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total Nominal Catch	169,407	n/a	n/a	n/a	114,843	111,578	104,504	127,551	124,203	121,497
Unallocated landings	14,833	-	-	-	-823	10,171	6,130	8,545	2,117	2,661
WG estimate of total landings	**184,240**	**139,936**	**125,314**	**102,478**	**114,020**	**121,749**	**110,634**	**136,096**	**126,320**	**124,158**

* The Danish industrial by-catch and the Norwegian coast catches are not included in the (WG estimate of) total landings of Division IIIa
n/a not available

Division IIIa (Skagerrak) landings not included in the assessment										
Country	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Norwegian coast *				854	923	909	760	846	748	911
Danish industrial by-catch *				953	1,360	511	666	749	676	205
Total				**1,807**	**2,283**	**1,420**	**1,426**	**1,595**	**1,424**	**1,116**

Table 6.4.2.2.cont Cod (*Gadus morhua*) in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak). Nominal landings (in tonnes) of COD, 1988–2007, as officially reported to ICES, and as used by the Working Group.

Sub-area IV										
Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Belgium	5,799	3,882	3,304	2,470	2,616	1,482	1,615	1,715	1,316	1,007
Denmark	23,002	19,697	14,000	8,358	9,022	4,676	5,889	6,291	5,104	3,441
Faroe Islands	102	96		9	34	36		15	4	0
France	2,934	1,750	1,222	717	1,777	617		515	227	425
Germany	8,045	3,386	1,740	1,810	2,018	2,048	2,212	2,648	2,526	1,899
Greenland						1,352				
Netherlands	14,676	9,068	5,995	3,574	4,707	2,305	1,728	1,659	1,585	n/a
Norway	5,823	7,432	6,410	4,383	4,994	4,518	3,205	2,886	2,733	3,056
Poland	25	19	18	18	39	35				
Sweden	540	625	640	661	463	252	226	306	309	386
UK (E/W/NI)	17,745	10,344	6,543	4,087	3,112	2,213	1,889	1,364		
UK (Scotland)	35,633	23,017	21,009	15,640	15,416	7,852	6,644	6,667		
United Kindom									8,341	8,096
Norwegian indust by-catch *									48	101
Danish industrial by-catch *									34	18
Total Nominal Catch	114,324	79,316	60,881	41,727	44,198	27,386	23,408	24,065	22,144	18,310
Unallocated landings	7,779	-924	-1,114	-754	102	-1,539	141	-194	49	1,372
WG estimate of total landings	**122,103**	**78,392**	**59,767**	**40,973**	**44,300**	**25,847**	**23,549**	**23,870**	**22,193**	**19,683**
Agreed TAC	**140,000**	**132,400**	**81,000**	**48,600**	**49,300**	**27,300**	**27,300**	**27,300**	**23,205**	**19,957**

Division VIId										
Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Belgium	239	172	110	93	51	54	47	50	80	84
Denmark	-	-	-	-	-					
France	7,788		3,084	1,677	1,361	1,127		467	668	1,127
Netherlands	19	3	4	17	6	36	14	9	9	n/a
UK (E/W/NI)	618	454	385	249	145	121	100	179		
UK (Scotland)	1	-	-	-	-					
United Kingdom									269	181
Total Nominal Catch	8,665	629	3,583	2,036	1,563	1,338	161	705	1,026	1,392
Unallocated landings	-85	6,229	-1,258	-463	1,534	-104	646	328	101	348
WG estimate of total landings	**8,580**	**6,858**	**2,325**	**1,573**	**3,097**	**1,234**	**807**	**1,033**	**1,127**	**1,740**

Division IIIa (Skagerrak)										
Country	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Denmark	12,340	8,734	7,683	5,901	5,526	3,071	3,039	3,613	3,054	2,649
Sweden	1,608	1,909	1,350	1,035	1,716	509	495	824	688	618
Norway	303	345	301	134	146	193	133	120	101	101
Germany	16	54	9	32	83	-			82	67
Others	-	-	-	-	-	-			47	0
Norwegian coast *	976	788	624	846	n/a	n/a	720	759	524	494
Danish industrial by-catch *	97	62	99	687	n/a	n/a	10	18	9	n/a
Total Nominal Catch	14,267	11,042	9,343	7,102	7,471	3,773	3,667	4,557	3,972	3,435
Unallocated landings	1,064	-68	-66	-16	-3	18	120	-752	-606	-489
WG estimate of total landings	**15,331**	**10,974**	**9,277**	**7,086**	**7,468**	**3,791**	**3,787**	**3,805**	**3,366**	**2,946**
Agreed TAC	**20,000**	**19,000**	**11,600**	**7,000**	**7,100**	**3,900**	**3,900**	**3,900**	**3,315**	**2,851**

Sub-area IV, Divisions VIId and IIIa (Skagerrak) combined										
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total Nominal Catch	137,256	90,987	73,807	50,865	53,232	32,497	27,236	29,327	27,142	23,137
Unallocated landings	8,758	5,238	-2,438	-1,233	1,633	-1,625	907	-618	-457	1,232
WG estimate of total landings	**146,014**	**96,225**	**71,369**	**49,632**	**54,865**	**30,872**	**28,143**	**28,708**	**26,686**	**24,369**

* The Danish and Norwegian industrial by-catch and the Norwegian coast catches are not included in the (WG estimate of) total landings
n/a not available

Division IV and IIIa (Skagerrak) landings not included in the assessment										
Country	1998	1999	2000	2001	2002	2003	2003	2005	2006	2007
Norwegian coast *	976	788	624	846	n/a	n/a	720	759	524	494
Norwegian indust by-catch *									48	101
Danish industrial by-catch *	97	62	99	687	n/a	n/a	10	18	43	18
Total	**1,073**	**850**	**723**	**1,533**	**0**	**0**	**730**	**777**	**615**	**613**

Table 6.4.2.3 Cod (G*adus morhua*) in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak). Landings, discards, and estimated total removals in tonnes.

	Landings	Discards	Catch (L+D)	Total estimated removals
1985	214.6	31.5	246.1	247.0
1986	204.1	139.1	343.1	341.0
1987	216.2	27.8	244.1	244.8
1988	184.2	10.7	195.0	194.8
1989	139.9	62.1	202.1	202.6
1990	125.3	27.0	152.3	153.0
1991	102.5	18.6	121.0	121.2
1992	114.0	36.9	150.9	151.8
1993	121.7	21.9	143.6	177.5
1994	110.6	99.6	210.2	212.9
1995	136.1	32.2	168.3	229.1
1996	126.3	14.3	140.6	203.8
1997	124.2	33.6	157.8	176.5
1998	146.0	40.5	186.5	182.5
1999	96.2	14.2	110.4	139.1
2000	71.4	13.7	85.1	95.5
2001	49.7	13.9	63.6	75.8
2002	54.9	5.7	60.6	81.7
2003	30.9	6.4	37.2	76.5
2004	28.2	5.8	34.0	52.0
2005	28.7	6.3	35.0	52.4
2006	26.6	8.1	34.6	53.5
2007	24.4	23.6	47.9	62.6

Table 6.4.2.4 Cod (*Gadus morhua*) in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak). Summary from stock assessment.

Run title: North Sea/Skagerrak/Eastern Channel Cod
Tuning data. INCLUDES DISCARDS
23/04/2008 16:29

B-ADAPT median values

	RECRUITS Age 1 ('000)	TSB (tons)	SSB (tons)	CATCH (tons)	YIELD/SSB	FBAR 2-4
1963	228540	413071	157257	128686	0.818	0.534
1964	399443	482315	158695	130740	0.824	0.510
1965	600416	630354	184554	210237	1.139	0.611
1966	708510	759390	213361	259416	1.216	0.626
1967	612282	800508	236547	276387	1.168	0.636
1968	262676	718662	242373	305911	1.262	0.759
1969	228850	585188	240302	205510	0.855	0.587
1970	930946	866955	249236	243867	0.978	0.671
1971	1407998	1062013	252747	412264	1.631	0.841
1972	268139	780669	230917	387737	1.679	0.886
1973	471632	617157	195341	269139	1.378	0.857
1974	470719	596439	224052	253989	1.134	0.760
1975	876154	654859	202909	242349	1.194	0.803
1976	675946	593758	172324	307102	1.782	1.013
1977	1668615	854151	155895	349038	2.239	0.894
1978	528504	737068	144003	328585	2.282	1.015
1979	1350162	880983	149493	430688	2.881	0.810
1980	2566638	1159434	170284	590678	3.469	0.928
1981	544678	785346	181696	393451	2.165	0.970
1982	883780	771572	176435	359372	2.037	1.068
1983	425490	596832	142449	281696	1.978	1.092
1984	1409444	779628	125186	379974	3.035	0.975
1985	256977	478356	118027	247031	2.093	0.974
1986	1626314	732356	109154	341047	3.124	1.019
1987	354511	540559	101929	244809	2.402	1.007
1988	236177	410877	92688	194798	2.102	1.058
1989	641820	459239	87450	202639	2.317	1.031
1990	204133	311096	75914	153021	2.016	1.047
1991	269785	289718	72091	121204	1.681	0.889
1992	582416	427941	72023	151755	2.107	0.836
1993	272894	365189	74178	177550	2.394	1.084
1994	1026370	531035	70023	212907	3.041	0.803
1995	455365	531562	89256	229144	2.567	1.022
1996	258502	432399	96045	203801	2.122	1.093
1997	837455	556788	84603	176460	2.086	0.954
1998	110145	342600	71482	182499	2.553	1.081
1999	202650	246748	68019	139129	2.045	1.270
2000	356541	252940	45445	95472	2.101	1.182
2001	104694	178998	35220	75782	2.152	0.886
2002	195938	222038	42542	81706	1.921	0.880
2003	91243	147628	39550	76491	1.934	1.035
2004	135611	129031	35559	51992	1.462	0.974
2005	112261	132755	32830	52384	1.596	0.815
2006	274458	148133	30985	53501	1.727	0.788
2007	118989	176318	36866	62588	1.698	0.639
2008			49941			

Annex 6.4.2

EU – Norway management plan

In 2005 the EU and Norway renewed their initial agreement from 1999 and *"agreed to implement a long-term management plan for the cod stock, which is consistent with the precautionary approach and is intended to provide for sustainable fisheries and high yield.*

Once the stock of cod has been measured for the current year and for the previous year as no longer being at risk of reduced reproductive capacity, the plan will come into operation on 1 January of the subsequent year.

The plan shall consist of the following elements:

1. *Every effort shall be made to maintain a minimum level of Spawning Stock Biomass (SSB) greater than 70,000 tonnes (B_{lim}).*

2. *Where the SSB is estimated to be above 150,000 tonnes the parties agreed to restrict their fishing on the basis of a TAC consistent with a fishing mortality rate that maximises long term yield. The parties agreed to use F=0.4 on appropriate age groups.*

3. *Where the rule in paragraph 2 would lead to a TAC which deviates by more than 15% from the TAC for the preceding year, the Parties shall fix a TAC that is neither more than 15% greater nor 15% less than the TAC of the preceding year.*

4. *Should the SSB of cod fall below 150 000t (B_{pa}) the Parties shall decide on a TAC that is lower than that corresponding to the application of the rules in paragraphs 2 and 3.*

5. *The Parties may where considered appropriate reduce the TAC by more than 15% compared to the TAC of the preceding year.*

6. *This plan shall be subject to triennial review, the first of which will take place before 1 January 2009, including appropriate adaptations to the target mortality rate specified in paragraph 2.*

The main changes between this and the plan of 1999 is the reduction of a target F to 0.4, and a limitation of the change of the TAC between years of 15%. ICES has not evaluated the consistency of the new management plan with the precautionary approach.

EU Recovery plan

The recovery plan adopted by the EU Council in 2004. Details of it are given in the Council Regulation (EC) 423/2004:

Article 1. This Regulation establishes a recovery plan for the following cod stocks (hereinafter referred to as "depleted cod stocks"):

(a) cod in the Kattegat;

(b) cod in the North Sea, in the Skagerrak and the eastern Channel;

(c) cod to the west of Scotland;

(d) cod in the Irish Sea.

Article 2.Definitions of geographical areas

For the purposes of this Regulation, the following definitions of geographical areas shall apply:

(a) "Kattegat" means that part of division III a, as delineated by ICES, that is bounded on the north by a line drawn from the Skagen lighthouse to the Tistlarna lighthouse, and from this point to the nearest point on the Swedish coast, and on the south by a line drawn from Hasenore to Gnibens Spids, from Korshage to Spodsbjerg and from Gilbjerg Hoved to Kullen;

(b) "North Sea" means ICES subarea IV and that part of ICES division III a not covered by the Skagerrak and that part of ICES division II a which lies within waters under the sovereignty or jurisdiction of Member States;

(c) "Skagerrak" means that part of ICES division III a bounded on the west by a line drawn from the Hanstholm lighthouse to the Lindesnes lighthouse and on the south by a line drawn from the Skagen lighthouse to the Tistlarna lighthouse and from that point to the nearest point on the Swedish coast;

(d) "eastern Channel" means ICES division VII d;

(e) "Irish Sea" means ICES division VII a;

(f) "west of Scotland" means ICES division VI a and that part of ICES division V b which lies within waters under the sovereignty or jurisdiction of Member States.

Article 3. Purpose of the recovery plan: The recovery plan (...) shall aim to increase the quantities of mature fish to values equal to or greater than 150 000 t (Cod in the North Sea, Skagerrak and eastern Channel)

Article 4: Reaching of target levels. Where the Commission finds, on the basis of advice (...), that for two consecutive years the target level for any cod stock concerned has been reached, the Council shall decide by (...) to remove that stock from the scope of this Regulation (...)

Article 5: Setting of TACs. A TAC shall be set in accordance with Article 6 where the quantities of mature cod have been estimated by the STECF, in the light of the most recent report of ICES, to be equal to or above the minimum level of 70 000 t (Cod in the North Sea, Skagerrak and eastern Channel).

Article 6: Procedure for setting TACs. (1.) Each year, the Council shall decide (...) on a TAC for the following year for each of the depleted cod stocks. (2.) The TACs shall not exceed a level of catches which a scientific evaluation (...) has indicated will result in an increase of 30 % in the quantities of mature fish in the sea at the end of the year of their application, compared to the quantities estimated to have been in the sea at the start of that year. (3.) The Council shall not adopt a TAC whose capture is predicted (...) to generate in its year of application a fishing mortality rate greater than 0.65 (Cod in the North Sea, Skagerrak and eastern Channel). (4.) (...) (5.) Except for the first year of application of this Article: (a) where the rules provided for in paragraphs 2 or 4 would lead to a TAC which exceeds the TAC of the preceding year by more than 15 %, the Council shall adopt a TAC which shall not be more than 15 % greater than the TAC of that year; or (b) where the rules provided for in paragraphs 2 or 4 would lead to a TAC which is more than 15 % less than the TAC of the preceding year, the Council shall adopt a TAC which is not more than 15 % less than the TAC of that year.

Article 7: Setting TACs in exceptional circumstances. Where the quantities of mature fish of any of the cod stocks concerned have been estimated by the STECF, in the light of the most recent report of the ICES, to be less than the quantities set out in Article 5, the following rules shall apply: (a) Article 6 shall apply where its application is expected to result in an increase in the quantities of mature fish at the end of the year of application of the TAC to a quantity equal to or greater than the quantity indicated in Article 5; (b) where the application of Article 6 is not expected to result in an increase in the quantities of mature fish at the end of the year of application of the TAC to a quantity equal to or greater than the quantity indicated in Article 5, the Council shall decide (...) on a TAC for the following year that is lower than the TAC resulting from the application of the method described in Article 6.

Article 8. Fishing effort limitations and associated conditions. (1.) The TACs referred to in Chapter III shall be complemented by a system of fishing effort limitation based on the geographical areas and groupings of fishing gear, and the associated conditions for the use of these fishing opportunities specified in Annex V to Council Regulation (EC) No 2287/2003 of 19 December 2003 fixing for 2004 the fishing opportunities and associated conditions for certain fish stocks and groups of fish stocks, applicable in Community waters and, for Community vessels, in waters where catch limitations are required. (2.) Each year, the Council shall decide by a qualified majority, on the basis of a proposal from the Commission, on adjustments to the number of fishing days for vessels deploying gear of mesh size equal to or greater than 100 mm in direct proportion to the annual adjustments in fishing mortality that are estimated by ICES and STECF as being consistent with the application of the TACs established according to the method described in Article 6.