

ECOREGION Celtic Sea and West of Scotland
STOCK Cod in Division VIa (West of Scotland)

Advice for 2015

No new data are available that change the perception of the stock from the advice given in 2013 (ICES, 2013). Therefore, the same catch advice is still applicable for 2015: ICES advises on the basis of the MSY and precautionary approach that there should be no directed fisheries and that bycatch and discards should be minimized.

Stock status

Fishing pressure				
	2011	2012	2013	
MSY (F_{MSY})	✗	✗	✗	Above target
Precautionary approach (F_{pa}, F_{lim})	✗	✗	✗	Harvest unsustainable
Stock size				
	2012	2013	2014	
MSY ($B_{trigger}$)	✗	✗	✗	Below trigger
Precautionary approach (B_{pa}, B_{lim})	✗	✗	✗	Reduced reproductive capacity

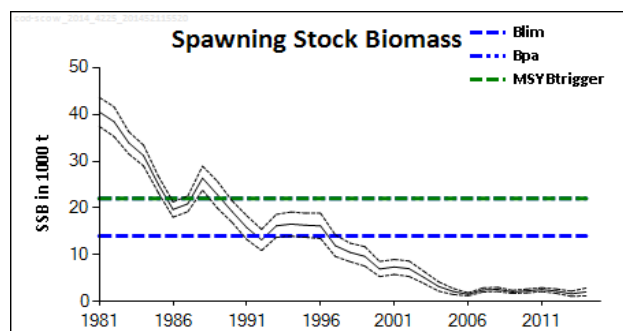
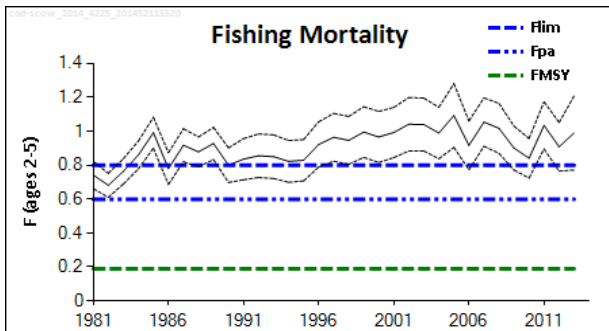
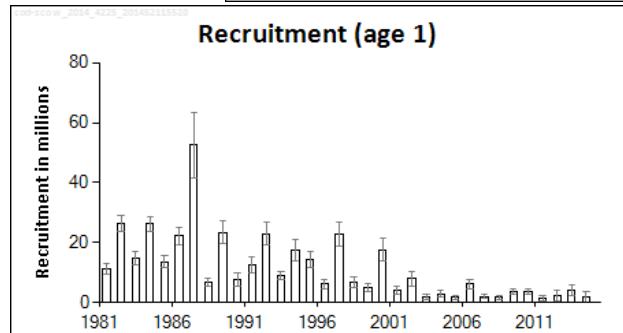
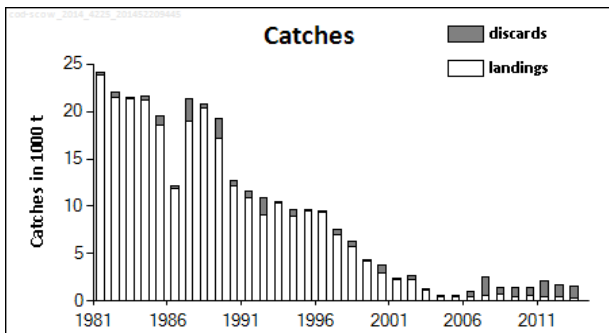
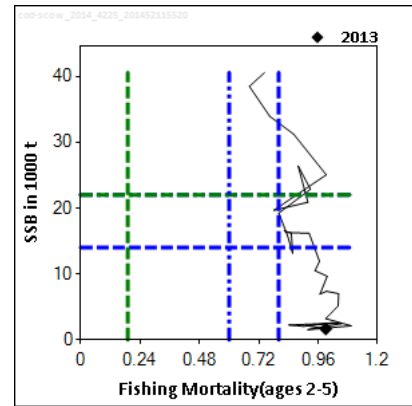


Figure 5.3.3.1 Cod in Division VIa (West of Scotland). Catches as observed by ICES and summary of stock assessment (weights in thousand tonnes); dotted black lines are the standard error for assessment estimates. Top right: SSB and F over the years.

Fishing mortality is high and has been above F_{lim} for most of the time-series. The spawning-stock biomass has been below B_{lim} since 1997 and has remained very low, well below B_{lim} since 2006. Recruitment has been estimated to be low since 2001 and is considered impaired.

Management plans

Cod in Division VIa is subject to the EU cod long-term management plan (EC 1342/2008). ICES has not evaluated whether the management plan is in accordance with the precautionary approach.

The fisheries

In 2013 the >100 mm otter trawl gear vessels targeting finfish (TR1) took ~88% of the cod catch and the 70–99 mm *Nephrops* fleet (TR2) took ~4% of the catch. Part of the landings comes from vessels using TR1 gear, fishing west of the line defined in the cod long-term management plan. Discards reported to ICES (all fleets combined) are roughly four times greater than landings.

Catch distribution Total catch in 2013 was 1501 t, where 20% are reported landings adjusted for misreporting and 80% are discards. Landings were 299 t (TR1 88%; TR2 4%; others 8%). Discards were 1202 t (TR1 72% and TR2 28%).

Scientific basis

Stock data category	1 (ICES, 2014a).
Assessment type	Analytical age-based assessment (TSA).
Input data	Commercial catches (international landings, ages and length frequencies from catch sampling); one survey index (ScoGFS-WIBTS-Q1); maturity data from surveys; natural mortalities from M at mean weight model (Lorenzen, 1996), using mean weight data from market sampling and discard observations.
Discards and bycatch	Included in the assessment since 1981, data series from the main fleets (covering 91% of the landings).
Indicators	Surveys: ScoGFS-WIBTS-Q4, IGFS-WIBTS-Q4, UKSGFS-WIBTS-Q1, and UKSGFS-WIBTS-Q4.
Other information	The stock was benchmarked in 2012 (WKROUND; ICES, 2012).
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE).

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Reference points

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY approach	MSY B _{trigger}	22 000 t.	B _{pa} .
	F _{MSY}	0.19	Provisional proxy by analogy with North Sea cod F _{max} . Fishing mortalities in the range of 0.17–0.33 are consistent with F _{MSY} .
Precautionary approach	B _{lim}	14 000 t.	B _{lim} = B _{loss} , the lowest observed spawning stock estimated in previous assessments.
	B _{pa}	22 000 t.	Considered to be the minimum SSB required to ensure a high probability of maintaining SSB above B _{lim} , taking into account the uncertainty of assessments. This also corresponds with the lowest range of SSB during the earlier, more productive historical period.
	F _{lim}	0.8	Fishing mortalities above this have historically led to stock decline.
	F _{pa}	0.6	This F is considered to have a high probability of avoiding F _{lim} .

(Last changed in: 2010)

Outlook for 2015

Basis: F (2014) = mean F (2011–2013) = 0.976 ; SSB (2015) = 2018; R 2014(Ricker) = 1.958 million; Catch (2014) = 1529; Landings (2014) = 300; Discards (2014) = 1229.

Rationale	Catch Total (2015)	Landings (2015)	Discards (2015)	Basis	F Total (2015)	F Land (2015)	F Disc (2015)	SSB (2016)	%SSB change ¹
MSY approach	38	8	30	$F_{MSY} \times SSB_{2015} / MSY B_{trigger}$	0.02	0.01	0.01	3852	+91%
Precautionary approach	0	0	0	Zero catch (SSB ₂₀₁₆ < B _{pa})	0	0	0	3907	+94%
Management plan	1186	231	955	$F = F_{2014} \times 0.75$	0.73	0.27	0.47	2200	+9%
Zero catch	0	0	0	$F = 0$	0.00	0.00	0.00	3907	+94%
Other options	393	79	314	$F_{2014} \times 0.2$	0.20	0.07	0.12	3338	+65%
	724	144	580	$F_{2014} \times 0.4$	0.39	0.14	0.25	2861	+42%
	1004	197	807	$F_{2014} \times 0.6$	0.59	0.21	0.37	2459	+22%
	1242	241	1001	$F_{2014} \times 0.8$	0.78	0.28	0.50	2121	+5%
	1443	277	1166	$F_{2014} \times 1.0$	0.98	0.36	0.62	1835	-9%
	1615	306	1309	$F_{2014} \times 1.2$	1.17	0.43	0.74	1593	-21%

Weights in tonnes.

¹ SSB 2016 relative to SSB 2015.

Note: no information on % TAC change can be shown as a zero TAC was set in 2014.

MSY and precautionary approach

Following the ICES MSY approach implies fishing mortality to be reduced to 0.02 (lower than the F_{MSY} proxy because SSB in 2015 is well below MSY B_{trigger}), which implies catches of no more than 38 tonnes in 2015. If discard rates do not change from the average of the last three years, this implies landings in 2015 of no more than 8 tonnes. This is expected to lead to an SSB of 3852 tonnes in 2016.

However, considering the low SSB and low recruitment over the last decade, it is not possible to identify any non-zero catch that would be compatible with the MSY and precautionary approach. Bycatches, including discards of cod in all fisheries in Division VIa, should be reduced to the lowest possible level and further technical measures to reduce catches should be implemented.

Management plan

The fisheries on this stock are managed under the cod long-term management plan (EC 1342/2008). Until the 2012 assessment benchmark ICES did not consider it possible to assess unaccounted mortality accurately. As a consequence ICES has not yet evaluated whether the management plan is in accordance with the precautionary approach.

Instead of strictly following the F_{2014} assumption indicated in the MP, F_{2014} has in the forecast been assumed to be equal to the average F of 2011–2013; this seems more appropriate given the lack of reduction in F estimated by the assessment.

The size of the stock predicted at the 1st of January 2015 (2018 t) is well below B_{lim} (14 000 t). Following the agreed management plan implies $F_{2015} = 0.75 \times F_{2014}$. This results in a TAC for 2015 of 231 tonnes. If discard rates do not change from the average of the last three years, this corresponds to catches in 2015 of 1186 tonnes.

Additional considerations

Management considerations

Management measures taken thus far have not recovered the stock and not constrained catches. TAC restrictions on landings and effort and spatial management of fisheries catching cod in Division VIa have not controlled mortality levels. In 2013 catches (landings + discards) were nine times greater than the reported landings and estimated mortality is increasingly due to discarding (Figure 5.3.3.3). It is necessary to reduce all sources of fishing mortality to recover the stock above B_{pa} as quickly as possible.

The zero TAC for this area and 1.5% bycatch by live weight limit implemented in 2012 applies to the retained part of the catches and therefore does not constrain discards. There is evidence to suggest that the introduction of this measure has resulted in substantially increased discard rates in some fleets. Measures to reduce the high discard rates are recommended.

Fleets fishing at depths less than 200 m (i.e. within the cod recovery zone) are subject to the effort restrictions of the cod long-term management plan (EC 1342/2008) and the new gear technical measures specified in EC 53/2010. Vessels fishing to the west of the management line are still subject to effort restrictions, but may apply for additional effort up to the point where fleet-aggregated effort equals that from the previous year (if fleet effort allowances were cut). Some landings from this stock are taken west of the line defined in EC 1342/2008.

Grey seal abundance is significant west of Scotland and they are known to feed on cod, among other species. The contribution of seal predation to total cod mortality is likely to be significant and this may impair the ability of the cod stock to recover.

Changes in fishing technology and fishing patterns

The implementation of the cod long-term plan effort controls (Annex IIa of Reg. (EC) 43/2009) and other technical measures, including gear restriction in Division VIa (Annex III of Reg. (EC) 43/2009) was expected to lead to large changes in fishing patterns, starting in 2009. However, the STECF-13-13 report analyses effort data and concludes that since 2009 and looking across all gears there was an increase in fishing effort in Division VIa (STECF, 2013). Despite a decline in the TR1 regulated gears this was not enough as the unregulated gears under articles 11 and 13 of EC Reg. (EC) 1342/2008 more than compensate for the drop in TR1 effort.

Data and Methods

Discard estimates are based primarily on sampling by Marine Scotland Science (MSS; covering around 16 trips). A parallel sampling programme organized by the Scottish Fishermen's Federation (SFF; covering around 34 trips) indicates lower discard rates (although not yet raised to fleet level), which may indicate more selective fishing practices. The inclusion of the SFF data may improve the accuracy and precision of discard estimates used in the assessment although this process is currently hindered by methodological issues.

Comparison of the basis of previous assessment and advice

The basis for the assessment has not changed from last year.

The basis for the advice this year is the same as last year.

Sources

- ICES. 2012. Report of the Benchmark Workshop on Western Waters Roundfish (WKROUND), 22–29 February 2012, Aberdeen, UK. ICES CM 2012/ACOM:49. 283 pp.
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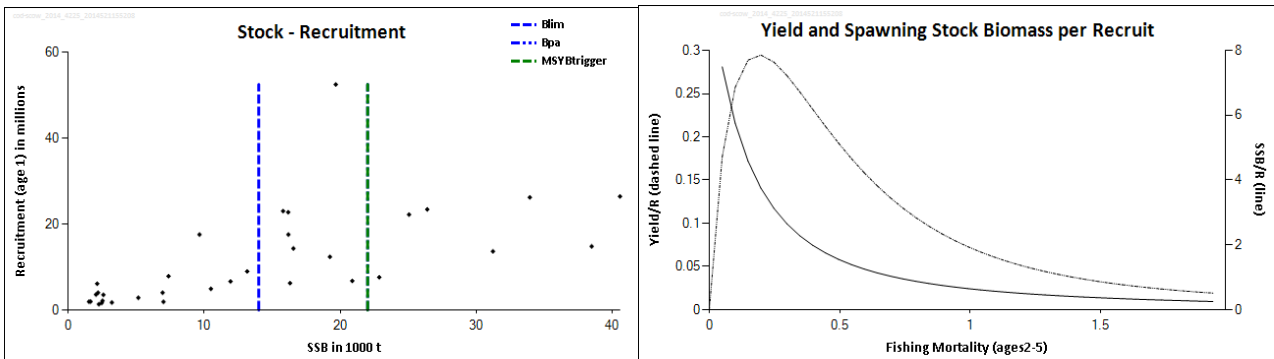


Figure 5.3.3.2 Cod in Division VIa. Stock–recruitment relationship (left panel) and yield-per-recruit analysis (right panel).

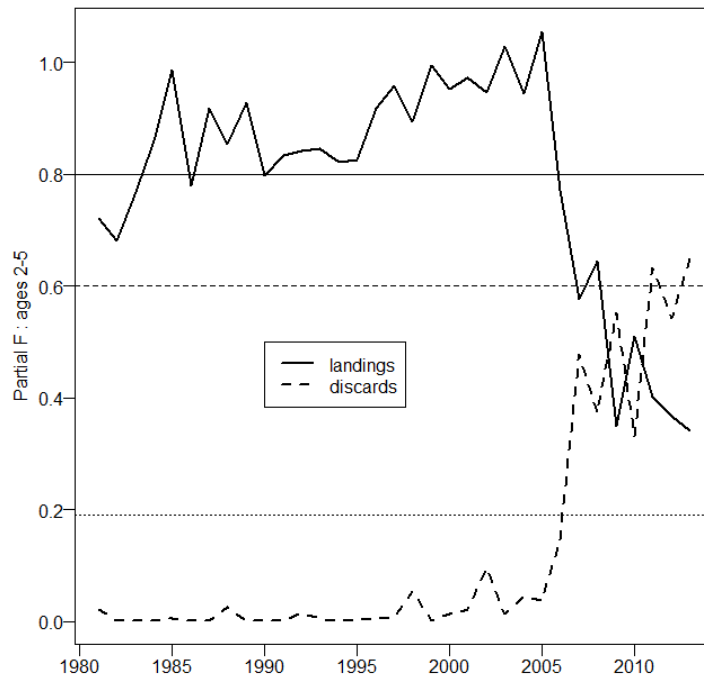


Figure 5.3.3.3 Cod in Division VIa. Partial mean F attributed to landings and discards. Horizontal lines represent F_{lim} (solid), F_{pa} (dashed), and F_{MSY} (dotted) reference points defined for the stock.

Table 5.3.3.1 Cod in Division VIa (West of Scotland). ICES advice, management, landings, discards, and catches.

Year	ICES advice Single-stock exploitation boundaries since 2004	Predicted catch corresp. to advice	Agreed TAC ^a	Agreed TAC ^b	Official landings	ICES landings	ICES discards	ICES catch
1987	Reduce F towards F_{max}	18.0	22.0		19.2	19.0	2.39	21.39
1988	No increase in F; TAC	16.0	18.4		19.2	20.4	0.37	20.77
1989	80% of F(87); TAC	16.0	18.4		15.4	17.2	2.08	19.28
1990	80% of F(88); TAC	15.0	16.0		11.8	12.2	0.57	12.77
1991	70% of effort (89)	-	16.0		10.6	10.9 ^c	0.62	11.52
1992	70% of effort (89)	-	13.5		9.0	9.7 ^d	1.78	11.48
1993	70% of effort (89)	-	14.0		10.5	11.8 ^d	0.14	11.94
1994	30% reduction in effort	-	13.0		9.1	10.8 ^d	0.66	11.46
1995	Significant reduction in effort	-	13.0		9.7	9.6 ^d	0.14	9.74
1996	Significant reduction in effort	-	13.0		9.6	9.4	0.06	9.46
1997	Significant reduction in effort	-	14.0		7.0	7.0	0.50	7.5
1998	20% reduction in F	9.5 ^f	11.0		5.7	5.7	0.54	6.24
1999	F reduced to below F_{pa}	< 9.7 ^f	11.8		4.3	4.2	0.07	4.27
2000	Recovery plan, 60% reduction in F	< 4.2	7.48		2.8 ^e	3.0	0.82	3.82
2001	Lowest possible F, recovery plan	-	3.7		2.4	2.3	0.09	2.39
2002	Recovery plan or lowest possible F	-	4.6		2.2	2.2	0.48	2.68
2003	Closure	-	1.81		1.3	1.2	0.03	1.23
2004	Zero catch ^g	0	0.85		0.6	0.5	0.07	0.57
2005	Zero catch ^g	0	0.72		0.4	0.5	0.04	0.54
2006	Zero catch ^g	0	0.613		0.5	0.49 ⁱ	0.47	0.96
2007	Zero catch ^g	0	0.49		0.5	0.60 ⁱ	1.88	2.48
2008	Zero catch ^g	0	0.402		0.4	0.68 ⁱ	0.70	1.38
2009	Zero catch ^g	0	0.302	0.240	0.23	0.41 ⁱ	0.95	1.36
2010	Zero catch ^g	0		0.240	0.25	0.56 ⁱ	0.79	1.35
2011	Zero catch ^g	0		0.182	0.22	0.45 ⁱ	1.67	2.12
2012	Zero catch ^g	0		0 ^h	0.22	0.47 ⁱ	1.17	1.64
2013	No directed fisheries, minimize by-catch and discards	0		0 ^h	0.17	0.30	1.20	1.50
2014	No directed fisheries, minimize by-catch and discards	0		0 ^h				
2015	No directed fisheries, minimize by-catch and discards	0						

Weights in thousand tonnes.

^aTAC is for the whole of Subdivision Vb₁ and Subareas VI, XII, and XIV.

^bTAC is for Subdivision Vb₁ and Division VIa.

^cNot including misreporting.

^dIncluding ICES estimates of misreporting.

^eIncomplete data.

^fFor Division VIa only.

^gSingle-stock boundaries and the exploitation of this stock should be conducted in the context of mixed fisheries, protecting stocks outside safe biological limits.

^hBycatch of cod in the area covered by this TAC may be landed, provided that it does not contain more than 1.5% of the live weight of the total catch retained on board per fishing trip.

ⁱIncludes an adjustment for misreporting.

Table 5.3.3.2 Cod in Division VIa. Official landings (tonnes).

Country	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Belgium	48	88	33	44	28	-	6	-	22	1	2	+	11	1	+
Denmark	-	-	4	1	3	2	2	3	2	+	4	2	-	-	+
Faroe Islands	-	-	-	11	26	-	-	-	-	-	-	-	-	-	-
France	7 411	5 096	5 044	7 669	3 640	2 220	2 503	1 957	3 047	2 488	2 533	2 253	956	714*	842*
Germany	66	53	12	25	281	586	60	5	94	100	18	63	5	6	8
Ireland	2 564	1 704	2 442	2 551	1 642	1 200	761	761	645	825	1 054	1 286	708	478	223
Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-
Norway	204	174	77	186	207	150	40	171	72	51	61	137	36	36	79
Spain	28	-	-	-	85	-	-	-	-	-	16	+	6	42	45
UK (E. W. N.I.)	260	160	444	230	278	230	511	577	524	419	450	457	779	474	381
UK (Scotland)	8 032	4 251	11 143	8 465	9 236	7 389	6 751	5 543	6 069	5 247	5 522	5 382	4 489	3 919	2 711
UK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total landings	18 613	11 526	19 199	19 182	15 426	11 777	10 634	9 017	10 475	9 131	9 660	9 580	6 992	5 671	4 289
Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*	
Belgium	+	2	+	-	-	-	-	-	-	-	0	0	0	0	
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Faroe Islands	-	-	-	-	2	0	0.8	12	1		0.2	0	-	-	
France	236	391	208	172	91	107	100.7	92	82	74	60.3	46	4.21	3.36	
Germany	6	4	+	+			2	2	1	0	0	0	0.04	0	
Ireland	357	319	210	120	34	27.9	18	70	58.2	24.4	48.7	41.3	17.8	13.7	
Netherlands	-	-	-	-	-	-	-	-	-	0		0	0	0	
Norway	114*	40*	88	45	10	17	30	30	65	18	20.7	8.3	56.2	24.017	
Spain	14	3	11	3	-	-	-	-	-	-	-	-	-	-	
UK (E. W. N.I.)	280	138	195	79	46	25	-	21	6	14	-	-	-	-	
UK (Scotland)	2 057	1 544	1 519	879	413	243	-	260	232	-	-	-	-	-	
UK	-	-	-	-	-	-	332.1	-	-	104	118.6	110	137.2	131.266	
Total landings	2 767	2 439	2 231	1 298	596	419.9	483.6	487	445.2	234.4	248.5	205.6	215.5	172.343	

* Preliminary.

Table 5.3.3.3 Cod in Division VIa (West of Scotland). Summary of stock assessment (weights in thousand tonnes). “est”: estimate; “se”: standard error.

Year	catch	catch.est	catch.se	landings	landings. est	landings. se	discards	discards. est	Discards .se	meanF. est	meanF. se	SSB. est	SSB. se	TSB.est	TSB.se	recruit. est	recruit. se
1981	24.168	24.322	1.426	23.865	24.206	1.424	0.303	0.116	0.070	0.742	0.040	40.537	1.550	59.001	2.151	11.235	0.898
1982	22.082	21.383	1.228	21.511	20.796	1.251	0.571	0.587	0.221	0.682	0.035	38.457	1.589	58.258	1.922	26.425	1.394
1983	21.503	20.660	1.000	21.305	20.449	0.998	0.197	0.211	0.106	0.764	0.037	33.912	1.187	49.549	1.513	14.813	1.069
1984	21.601	20.853	0.995	21.272	20.266	1.019	0.329	0.587	0.229	0.860	0.041	31.210	1.110	53.107	1.544	26.210	1.297
1985	19.570	18.273	0.852	18.607	17.686	0.853	0.963	0.588	0.135	0.992	0.046	25.039	0.882	36.318	1.141	13.649	1.096
1986	12.083	12.390	0.775	11.820	11.710	0.742	0.263	0.680	0.181	0.781	0.047	19.663	0.812	34.433	1.232	22.203	1.458
1987	21.358	18.446	1.181	18.971	17.263	1.082	2.388	1.184	0.480	0.918	0.049	20.873	0.840	43.552	2.073	52.491	5.488
1988	20.781	19.260	1.479	20.413	19.004	1.465	0.368	0.256	0.104	0.879	0.044	26.376	1.281	42.508	2.282	6.761	0.684
1989	19.246	16.913	1.286	17.169	15.683	1.229	2.076	1.231	0.370	0.929	0.047	22.852	1.436	36.667	1.947	23.408	1.854
1990	12.746	12.277	0.823	12.175	12.114	0.815	0.571	0.163	0.054	0.801	0.051	19.231	1.151	26.936	1.548	7.616	1.017
1991	11.549	10.567	1.093	10.927	10.200	1.063	0.622	0.367	0.132	0.836	0.061	15.788	1.269	23.652	1.850	12.383	1.366
1992	10.865	9.585	1.023	9.086	8.812	0.976	1.779	0.774	0.215	0.856	0.064	13.156	1.128	23.542	1.783	23.010	1.802
1993	10.453	11.137	1.102	10.314	10.710	1.085	0.139	0.427	0.142	0.851	0.064	16.178	1.224	28.067	1.968	8.973	0.769
1994	9.588	10.883	1.093	8.928	10.250	1.047	0.661	0.633	0.181	0.823	0.062	16.544	1.295	26.570	1.948	17.554	1.741
1995	9.580	10.918	1.117	9.439	10.515	1.090	0.141	0.403	0.113	0.830	0.061	16.299	1.292	27.118	2.042	14.320	1.372
1996	9.489	11.166	1.188	9.427	10.920	1.169	0.063	0.246	0.070	0.923	0.067	16.164	1.350	24.049	1.958	6.242	0.780
1997	7.533	9.804	1.126	7.034	8.828	1.041	0.499	0.976	0.302	0.965	0.070	11.925	1.148	24.507	2.024	22.746	2.087
1998	6.252	8.817	1.031	5.714	8.535	1.013	0.538	0.282	0.095	0.947	0.071	10.491	0.992	17.234	1.555	6.632	0.897
1999	4.270	7.021	0.935	4.201	6.776	0.911	0.069	0.246	0.072	0.996	0.075	9.644	1.040	14.082	1.462	4.921	0.652
2000	3.798	6.311	0.813	2.977	5.418	0.731	0.821	0.894	0.261	0.967	0.075	6.940	0.808	14.853	1.477	17.557	1.880
2001	2.439	5.811	0.781	2.347	5.588	0.761	0.092	0.223	0.068	0.993	0.074	7.377	0.799	12.366	1.305	4.026	0.587
2002	2.722	5.717	0.804	2.243	5.335	0.763	0.480	0.382	0.131	1.042	0.079	7.004	0.826	11.461	1.286	7.858	1.147
2003	1.275	3.925	0.609	1.241	3.806	0.590	0.034	0.119	0.047	1.040	0.078	5.150	0.647	7.625	0.998	1.903	0.499
2004	0.612	2.352	0.441	0.540	2.204	0.419	0.072	0.148	0.053	0.990	0.076	3.210	0.499	4.641	0.701	2.840	0.559
2005	0.552	1.717	0.330	0.511	1.607	0.316	0.041	0.110	0.038	1.094	0.094	2.126	0.323	3.434	0.479	1.734	0.367

Table 5.3.3.3(cont.) Cod in Division VIa (West of Scotland). Summary of stock assessment (weights in thousand tonnes). “est”: estimate; “se”: standard error.

Year	catch	catch.est	catch.se	landings	landings. est	landings. se	discards	discards. est	Discards .se	meanF. est	meanF. se	SSB. est	SSB. se	TSB.est	TSB.se	recruit. est	recruit. se
2006	0.954	1.396	0.191	0.488	0.409	0.059	0.465	0.987	0.167	0.918	0.072	1.532	0.158	3.662	0.337	6.113	0.741
2007	2.474	1.997	0.251	0.595	0.548	0.074	1.880	1.449	0.238	1.055	0.071	2.462	0.214	4.141	0.369	1.936	0.284
2008	1.377	1.773	0.203	0.682	0.575	0.082	0.695	1.198	0.198	1.018	0.074	2.591	0.224	3.621	0.302	1.642	0.290
2009	1.353	1.501	0.163	0.408	0.435	0.051	0.945	1.066	0.163	0.901	0.065	2.047	0.166	3.518	0.293	3.522	0.507
2010	1.344	1.622	0.195	0.559	0.544	0.052	0.785	1.078	0.178	0.841	0.058	2.252	0.197	4.228	0.376	3.598	0.489
2011	2.124	1.883	0.208	0.454	0.435	0.043	1.670	1.448	0.204	1.035	0.070	2.523	0.210	3.801	0.344	1.347	0.512
2012	1.632	1.463	0.189	0.466	0.459	0.049	1.166	1.004	0.186	0.909	0.072	2.195	0.234	3.019	0.390	2.134	0.865
2013	1.501	1.227	0.204	0.299	0.344	0.041	1.202	0.883	0.208	0.990	0.109	1.649	0.278	2.578	0.464	4.028	0.836
2014	NA	1.542	0.313	NA	0.419	0.124	NA	1.123	0.269	0.961	0.108	2.043	0.411	3.298	0.636	1.958	0.904

Annex 5.3.3.1 Regulations and cod avoidance schemes relevant to Division VIa cod

Area closures

- Clyde Sea area closure – STECF (2007) noted that the Clyde closure includes the main spawning area of a reproductively isolated aggregation of cod and concluded that the closure is likely to have a positive effect in reducing targeting of high densities of mature cod.
- Windsock closed area – STECF (2007) concluded that the extent of the Windsock closure is unlikely to be large enough to greatly reduce fishing mortality on cod, and its boundaries should be reconsidered. However, its removal would not help improve cod recovery.
- Since 2009, the Irish authorities introduced a seasonal closure in Division VIa. The closure covers ICES statistical rectangle 39E3 and is in force from October 31 to March 31. Historically, over 40% of Irish cod landings from ICES Division VIa are from the closed area. For contrast, standardized cpue rates observed from a dedicated survey conducted inside the closed area in 2006 were on average 26.8 kg hr⁻¹ while cpue rates estimated from observer trips outside the closure gathered in the same period were 0.015 kg hr⁻¹. STECF (2012) concluded that, in accordance with the provisions of article 13 (Reg. (EC) 1342/2008), the partial cod mortality associated with the Irish fleet had declined considerably (>50%) since the introduction of the cod closure and other measures, although it is not possible to disentangle the effects of the Cape closure from other measures.

Mesh sizes and catch composition rules

- Catch composition rules related to days-at-sea allowances (Reg. (EC) 850/1998 Annex I and Reg. (EC) 2056/2001) – These rules legislate for landings compositions, but do not restrict discards.
- Emergency measures introduced in EC regulation 43/2009 (Annex III) (and rolled forward into 2010 and 2011) prohibited all fishing activity to the east of the West of Scotland Management (French) line in Division VIa, with the exception of a number of derogated fisheries. These measures have been incorporated into a new EC regulation 227/2013. For demersal otter trawlers targeting whitefish this required an increase in mesh size to 120 mm and the inclusion of a 120 mm square-meshed panel (SMP). Vessels targeting *Nephrops* also require the 120 mm SMP or a sorting grid. More stringent catch composition rules have also been introduced. For *Nephrops*-directed fisheries, no more than 10% of the retained catch can consist of cod, haddock, and whiting, where the limit is no more than 30% for whitefish targeted vessels. For 2012 a zero TAC for cod and a 1.5% bycatch by live weight limit was introduced and this was carried through to 2013, but in 2012 the catch composition limit on haddock was removed (Reg. (EC) 161/2012).

Effort limitations

- Between 2003 and 2011 STECF (2012) reported that the fishing effort (in kW-days) of trawlers using >100 mm mesh declined by 59%. These vessels primarily targeted roundfish, including cod. Over the same period effort for trawlers using 70–99 mm mesh declined by 16%. These vessels primarily target *Nephrops* and in 2011 22% of the effort in this category was exempt from effort controls because of less than 1.5% of cod in the catch (article 11).
- Annex IIa of Reg. (EC) 39/2013 does not require effort reduction compared to 2012 except for French trawlers using >100 mm mesh (20% reduction).

Supply chain traceability

Unreported landings are expected to have reduced under the UK “Buyers and Sellers” and Irish “Sales Note” regulations. Observer data, however, show an increase in discards starting in 2006. The amount of discards relative to landings has increased and the age pattern of discarding has changed. Currently discards of fish aged 3 and above are being recorded.

Cod avoidance measures

In 2008, Scotland introduced a voluntary programme known as “Conservation Credits”, which involved seasonal closures, real-time closures (RTCs), and various selective gear options. This was designed to reduce mortality and discarding of cod. The number of RTCs west of Scotland were four in 2008, twenty in 2009, nineteen in 2010, four in 2011, and nine in 2012, representing 27%, 14%, 12%, 2%, and 5% of the total RTCs in each year. RTCs are determined by lpue, based on fine-scale VMS data and daily logbook records, and also by on-board inspections. The low number of RTCs west of Scotland result from few instances of high lpue in the area. Estimates of continuing high discard rates in Division VIa indicate the scheme has not been effective west of Scotland.

Annex 5.3.3.2 EU management plan

The European Commission has adopted Council Regulation (EC) No. 1342/2008 which establishes measures for the recovery and long-term management of cod stocks. The stated objective of the plan is to ensure the sustainable exploitation of the cod stocks on the basis of maximum sustainable yield while maintaining a fishing mortality of 0.4. Articles 7–9, describing aspects of the plan relevant for west of Scotland cod, are reproduced below:

Article 7

Procedure for setting TACs for cod stocks in the Kattegat the west of Scotland and the Irish Sea

1. Each year, the Council shall decide on the TAC for the following year for each of the cod stocks in the Kattegat, the west of Scotland and the Irish Sea. The TAC shall be calculated by deducting the following quantities from the total removals of cod that are forecast by STECF as corresponding to the fishing mortality rates referred to in paragraphs 2 and 3: (a) a quantity of fish equivalent to the expected discards of cod from the stock concerned; (b) as appropriate a quantity corresponding to other sources of cod mortality caused by fishing to be fixed on the basis of a proposal from the Commission.

2. The TAC shall, based on the advice of STECF, satisfy all of the following conditions: (a) if the size of the stock on 1 January of the year of application of the TAC is predicted by STECF to be below the minimum spawning biomass level established in Article 6, the fishing mortality rate shall be reduced by 25 % in the year of application of the TAC as compared with the fishing mortality rate in the previous year; (b) if the size of the stock on 1 January of the year of application of the TAC is predicted by STECF to be below the precautionary spawning biomass level set out in Article 6 and above or equal to the minimum spawning biomass level established in Article 6, the fishing mortality rate shall be reduced by 15 % in the year of application of the TAC as compared with the fishing mortality rate in the previous year; and (c) if the size of the stock on 1 January of the year of application of the TAC is predicted by STECF to be above or equal to the precautionary spawning biomass level set out in Article 6, the fishing mortality rate shall be reduced by 10 % in the year of application of the TAC as compared with the fishing mortality rate in the previous year.

If the application of paragraph 2(b) and (c) would, based on the advice of STECF, result in a fishing mortality rate lower than the fishing mortality rate specified in Article 5(2), the Council shall set the TAC at a level resulting in a fishing mortality rate as specified in that Article.

4. When giving its advice in accordance with paragraphs 2 and 3, STECF shall assume that in the year prior to the year of application of the TAC the stock is fished with an adjustment in fishing mortality equal to the reduction in maximum allowable fishing effort that applies in that year.

5. Notwithstanding paragraph 2(a), (b) and (c) and paragraph 3, the Council shall not set the TAC at a level that is more than 20 % below or above the TAC established in the previous year.

Article 9

Procedure for setting TACs in poor data conditions

Where, due to lack of sufficiently accurate and representative information, STECF is not able to give advice allowing the Council to set the TACs in accordance with Articles 7 or 8, the Council shall decide as follows: (a) where STECF advises that the catches of cod should be reduced to the lowest possible level, the TACs shall be set according to a 25 % reduction compared to the TAC in the previous year; (b) in all other cases the TACs shall be set according to a 15 % reduction compared to the TAC in the previous year, unless STECF advises that this is not appropriate.

Article 10

Adaptation of measures

1. When the target fishing mortality rate in Article 5(2) has been reached or in the event that STECF advises that this target, or the minimum and precautionary spawning biomass levels in Article 6 or the levels of fishing mortality rates given in Article 7(2) are no longer appropriate in order to maintain a low risk of stock depletion and a maximum sustainable yield, the Council shall decide on new values for these levels.

2. In the event that STECF advises that any of the cod stocks is failing to recover properly, the Council shall take a decision which: (a) sets the TAC for the relevant stock at a level lower than that provided for in Articles 7, 8 and 9; (b) sets the maximum allowable fishing effort at a level lower than that provided for in Article 12; (c) establishes associated conditions as appropriate.