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8.3.4 Cod (*Gadus morhua*) in subdivisions 22–24, western Baltic stock (western Baltic Sea)

ICES stock advice

ICES advises that when the MSY approach is applied, total commercial catches in 2017 for the western Baltic cod stock should be no more than 917 tonnes.

Stock development over time

The spawning-stock biomass (SSB) has been below the limit reference point, B_{lim} since 2008. The fishing mortality (F) is well above F_{MSY}. Recruitment (R) has been low since 1999. R in 2016 is estimated to be the lowest in the time-series.

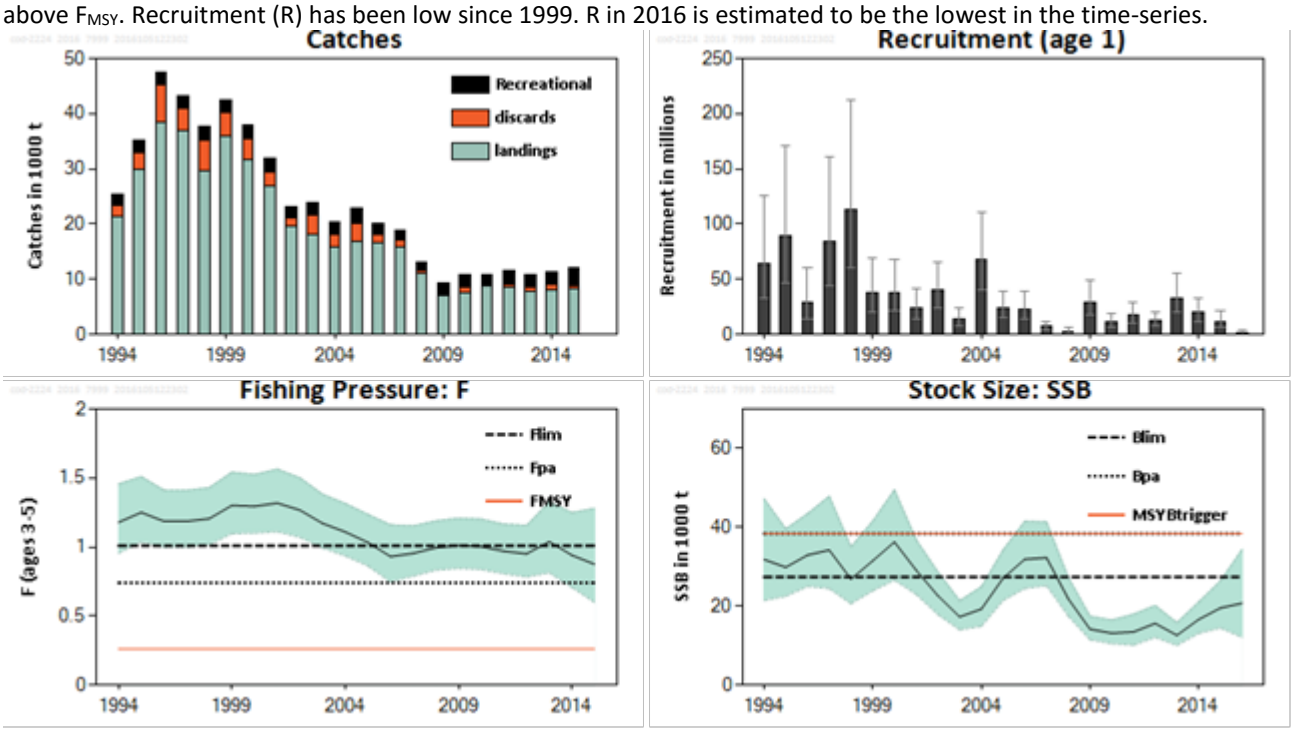

Figure 8.3.4.1[†] Cod in subdivisions 22–24 (western Baltic cod). Summary of stock assessment (weights in thousand tonnes). Recruitment, F, and SSB have confidence intervals (95%) in the plot. The EU landing obligation started in 2015; therefore, landings in 2015 include fish above and below the minimum conservation reference size (MCRS).

Stock and exploitation status

Table 8.3.4.1 Cod in subdivisions 22–24 (western Baltic cod). State of the stock and fishery relative to reference points.

		Fishing pressure					Stock size				
		2013	2014	2015				2014	2015	2016	
Maximum sustainable yield	F_{MSY}	✗	✗	✗	Above		MSY $B_{trigger}$	✗	✗	✗	Below
Precautionary approach	F_{pa}, F_{lim}	✗	o	o	Increased risk		B_{pa}, B_{lim}	✗	✗	✗	Reduced reproductive capacity
Management plan	F_{MGT}	-	-	-	Not applicable		SSB_{MGT}	-	-	-	Not applicable

[†]Version 3: updated SSB and R values for 2016.

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Catch options

Table 8.3.4.2 Cod in subdivisions 22–24 (western Baltic cod). The basis for the forecast.

Variable	Value	Source	Notes
$F_{ages\ 3–5}$ (2016)	0.58	ICES (2016a)	Based on catch constraint for 2016.
SSB (2017)	22470 t	ICES (2016a)	
R_{age1} (2017)	13605 thousand	ICES (2016a)	Sampled from the last ten years.
R_{age1} (2018)	13062 thousand	ICES (2016a)	Sampled from the last ten years.
Total catch (2016)	10327 t	ICES (2016a)	Based on catch constraint. Calculated as the 2016 TAC (12 720 t) plus an assumed discard ratio as in 2015 (5.1%), and accounting for the proportion of western Baltic cod in commercial catches in subdivisions 22–24 in 2013–2015 (58%), and the mean recreational catch of 2013–2015 (2558 t).
Commercial landings (2016)	7373 t	ICES (2016a)	Based on total catch minus recreational catch. The 2015 discard ratio (5.1%) was used to split the commercial catch into landings and discards.
Commercial discards (2016)	396 t	ICES (2016a)	Based on total catch minus recreational catch. The 2015 discard ratio (5.1%) was used to split the commercial catch into landings and discards.
Recreational catches (2016)	2558 t	ICES (2016a)	Average of the estimates for 2013–2015.

Table 8.3.4.3 Cod in subdivisions 22–24 (western Baltic cod). The forecast and catch options. Weights in tonnes.

Rationale	Total catch 2017*	Commercial catch, assuming a recreational catch of 2558 tonnes	Basis	F_{total} 2017	SSB 2018	%SSB change**
MSY approach	3475	917	$F = F_{MSY} \times (SSB_{2017} / MSY\ B_{trigger})$	0.15	31375	40
F_{MSY}	5722	3164	F_{MSY}	0.26	28450	27
Zero commercial catch	2558	0	Zero commercial catch	0.11***	32560	45
F_{MSY} ranges with Advice Rule^	2558	0	$F = MSY\ F_{lower(AR)} \times (SSB_{2017} / MSY\ B_{trigger})$	0.11***	32560	45
	5722	3164	$F = MSY\ F_{upper(AR)} \times (SSB_{2017} / MSY\ B_{trigger})$	0.26	28450	27
Other options	2819	261	MSY $F_{lower(AR)}$ differing by 0.01	0.12	32172	43
	3040	482	MSY $F_{lower(AR)}$ differing by 0.02	0.13	31907	42
	3258	700	MSY $F_{lower(AR)}$ differing by 0.03	0.14	31641	41
	3475	917	MSY $F_{lower(AR)}$ differing by 0.04	0.15	31375	40
	3689	1131	MSY $F_{lower\ (AR)}$ differing by 0.05	0.16	31109	38
	3901	1343	MSY $F_{lower(AR)}$ differing by 0.06	0.17	30834	37
	4111	1553	MSY $F_{lower(AR)}$ differing by 0.07	0.18	30562	36
	4319	1761	MSY $F_{lower(AR)}$ differing by 0.08	0.19	30292	35
	4525	1967	MSY $F_{lower(AR)}$ differing by 0.09	0.20	30022	34
	4728	2170	MSY $F_{lower(AR)}$ differing by 0.10	0.21	29752	32

Rationale	Total catch 2017*	Commercial catch, assuming a recreational catch of 2558 tonnes	Basis	F_{total} 2017	SSB 2018	%SSB change**
	4930	2372	MSY $F_{lower(AR)}$ differing by 0.11	0.22	29484	31
	5131	2573	MSY $F_{lower(AR)}$ differing by 0.12	0.23	29220	30
	5330	2772	MSY $F_{lower(AR)}$ differing by 0.13	0.24	28950	29
	5527	2969	MSY $F_{lower(AR)}$ differing by 0.14	0.25	28696	28
	6491	3933	B_{lim} in 2018	0.3	27451	22
	8456	5898	TAC(2016) −20% ^^	0.41	24890	11
	13191	10633	F_{pa}	0.74	18915	−16
	18166	15608	F_{lim}	1.01	15171	−32

* Includes commercial and recreational catch.

** SSB 2018 relative to SSB 2017.

*** Assuming 2558 tonnes of recreational catches in 2017 implies that the minimum F that can occur in 2017 is 0.11 even with a zero commercial catch. Therefore, values of F less than 0.11 are not included in the catch options table as they are not considered realistic unless recreational fisheries are regulated.

^ Ranges with the advice rule (AR) advised by ICES in 2015 (ICES, 2015a). Taking into account that SSB_{2017} is below MSY $B_{trigger}$, $F_{lower(AR)}$ and $F_{upper(AR)}$ are reduced according to the factor SSB_{2017} / MSY $B_{trigger}$ = 0.59 (ICES, 2015a). This results in $F_{lower(AR)} \times 0.59 = 0.09$ and $F_{upper(AR)} \times 0.59 = 0.26$. However, assuming a recreational catch of 2558 t, the lowest possible F that can be realised in 2017 is 0.11 and, therefore, values of F less than 0.11 are not included in the catch options table.

^^ To assess the impact on the western Baltic cod of a 20% TAC reduction in 2017 compared to 2016 (resulting in a TAC of 10 176 t in 2017), the assumed 2017 TAC was split into eastern (42%) and western Baltic cod (58%), giving a commercial catch of western cod of 5898 t. With an assumed recreational catch of 2558 t, the resulting total catch of the western cod stock is 8456 t.

SSB is forecasted to remain below B_{pa} and MSY $B_{trigger}$ in 2018 under all catch options, even if the commercial fishery is closed. Any F above 0.30 is predicted to result in an SSB below B_{lim}.

Basis of the advice

Table 8.3.4.4 Cod in subdivisions 22–24 (western Baltic cod). The basis of the assessment and advice.

Advice basis	MSY approach
Management plan	An EU Management Plan has been formally in place since 2007 (EU, 2007) but has not been used to set the TAC since 2014. ICES has considered the plan not in accordance with the precautionary approach since 2014. ICES assessment results from 2015 onwards cannot be used to inform the 2007 Management Plan. There is a proposed EU management plan for the Baltic Sea in 2016. The plan has not been formally implemented.

Quality of the assessment

Mixing of the eastern and western Baltic cod stocks is substantial in Subdivision 24. The stock mixing within Subdivision 24 is variable spatially, and possibly also between seasons and age groups. This introduces uncertainty in the allocation of catches to stock. Separation data was available for 8 out of the 22 years in the time-series. The allocation of catches to stock for the remaining 14 years was performed by extrapolation. The longest gap in the data is from 2001 to 2007. For later years a stock-splitting key is available for at least every second year.

In 2015 the recreational catches included in the stock assessment constitute 26% of the total catches in the stock assessment. The uncertainty around recreational catches is considered higher than the uncertainty in commercial catches.

Recreational catches are underestimated for the whole time-series as they include only German data; recreational catches from Denmark and Sweden are presently not included in the stock assessment. The German recreational catch data are considered reliable after 2005 and were extrapolated for previous years.

Figure 8.3.4.2[‡] Cod in subdivisions 22–24 (western Baltic cod). Historical assessment results (final-year recruitment estimates included). The assessments conducted in the years before 2015 were for cod in the area of subdivisions 22–24 that contains also a fraction of the eastern Baltic cod stock. Since the benchmark in 2015 the assessment is conducted for the western Baltic cod stock only, and is not comparable to the previous assessments conducted for subdivisions 22–24.

Issues relevant for the advice

A mixture of eastern (EB) and western Baltic (WB) cod stocks is caught in the western Baltic management area (subdivisions 22–24). The assessment and this advice is for the western Baltic cod stock.

Recreational catches of cod in the western Baltic management area are considered to consist exclusively of WB cod. As the recreational catches are not restricted, the assumed recreational catch has been subtracted from the advised catch of WB cod to arrive at the catch for commercial fishing. ICES has implemented this calculation assuming a recreational catch of 2558 t in 2017, corresponding to the observed average in the most recent three years (Table 8.3.4.5). This is based on the observation that the total recreational landings are estimated to be rather stable from year to year. If the recreational fishery changes in the future or if effective management measures to regulate recreational catches are implemented, this could lead to a different calculation.

To derive a management area-based total commercial cod catch for the western and eastern Baltic areas (subdivisions 22–24 and 25–32) consistent with the ICES advice for the two cod stocks, ICES considers that the following issues should be taken into account:

1. The distribution area of the WB cod stock is subdivisions 22–24. The proportions of the WB cod stock commercial catch taken in subdivisions 22–23 and Subdivision 24 have been quite stable since 1994, amounting to 69% and 31%, respectively, on average in the most recent three years (Table 8.3.4.5).
2. The distribution area of the EB cod stock is subdivisions 24 and 25–32.
3. Commercial fishing in subdivisions 22–23 will provide a catch of the WB cod stock only.
4. Commercial fishing in subdivisions 25–32 will provide a catch of the EB cod stock only.
5. Commercial fishing in Subdivision 24 will provide a mixed catch of the EB and WB cod stocks. In the most recent three years, the ratio EB cod / WB cod commercial catch in Subdivision 24 has been 2.36 (Table 8.3.4.5, right-most column).

[‡] Version 3: updated SSB and R values for 2016.

6. Species TAC for an area that includes two stocks of the species should be set to minimize the risk of overexploitation of the weakest stock, which at present is the WB cod stock. Assuming the same stock distribution and fishing pattern as in recent years, this implies that the intended catch of the WB cod stock in Subdivision 24 will determine the amount of EB cod that may be caught in that subdivision.

Assuming the geographical distribution of the commercial catch in 2017 remains as outlined in point 1 above, the distribution of the advised commercial catch of WB cod (917 t) will be 633 t in subdivisions 22–23 and 284 t in Subdivision 24. The additional amount of EB cod fished in Subdivision 24 is estimated to be 671 t, assuming the same ratio between EB cod and WB cod as observed on average during 2013–2015 in the commercial catches (i.e. 2.36, see point 5 above). This gives a total estimated commercial catch in 2017 of 1588 t for cod in subdivisions 22–24.

Figure 8.3.4.3 provides a graphic presentation of the procedure how to arrive at area-based TACs from the ICES stock advice.

The European Commission has requested ICES to only provide information on catch opportunities by management area consistent with the stock advice, assuming a *status quo* distribution of the fisheries on subareas and stocks. There could be other allocation schemes also consistent with the advice per stock. There is no optimal biological solution for these allocation issues.

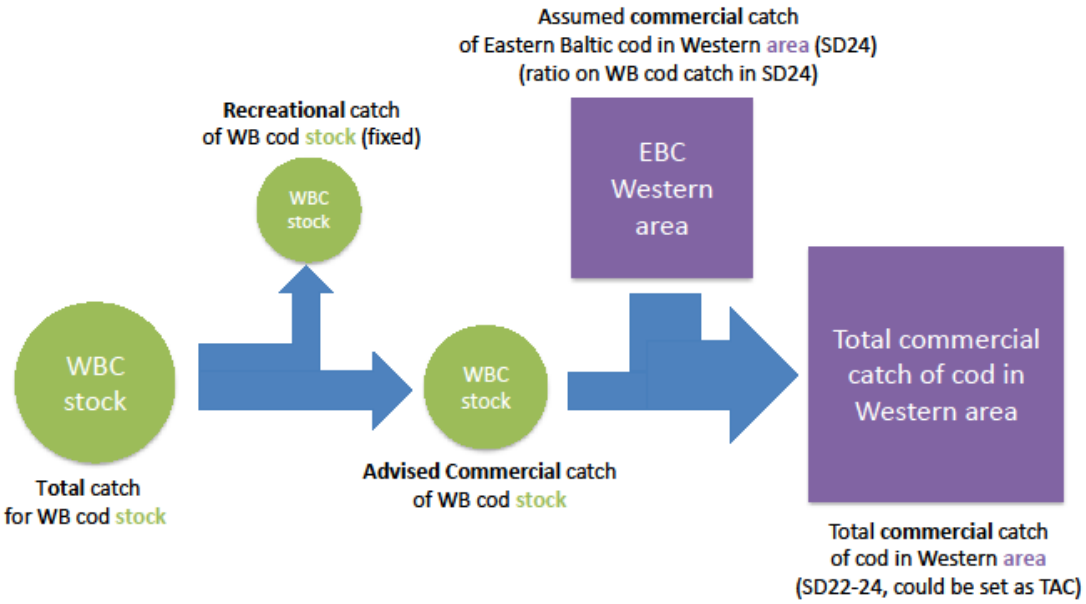

Figure 8.3.4.3 Cod in subdivisions 22–24 (western Baltic cod). Illustration of calculations to obtain area TACs for western and eastern Baltic cod from ICES stock-based catch advice, taking into account stock mixing in Subdivision 24 and recreational catches for the western stock.[§]

[§]Version 2: figure updated.

Table 8.3.4.5 Cod in subdivisions 22–24 (western Baltic cod). Catches (tonnes) used in the stock assessments of the western and eastern Baltic cod stocks.

Year	WB cod stock					EB cod stock					WB+EB stocks	EB stock / WB stock
	Commercial catch				Recreational catch*	Landings in SD 24	Discards in SD 24 **	Landings in SDs 25–32	Discards in SDs 25–32	% of catch in SD 24	Cod catch in SDs 22–24	Commercial cod catch in SD 24
	Landings	Discards	% of catch in SDs 22–23	% of catch in SD 24								
1994	21409	2069	46	54	1828	1784	166	100856	1956	2	27256	0.15
1995	29854	3143	66	34	2133	4041	541	107718	1872	4	39712	0.41
1996	38335	6897	68	32	2190	10210	1087	124189	1443	8	58719	0.78
1997	37009	3994	67	33	2280	6615	629	88600	3462	7	50526	0.53
1998	29628	5577	63	37	2372	4588	630	67428	2299	7	42795	0.40
1999	35817	4390	68	32	2243	6338	588	72995	1838	8	49376	0.53
2000	31653	3794	68	32	2386	6694	1153	89289	6019	8	45680	0.69
2001	26983	2456	67	33	2494	7261	383	91328	2891	8	39576	0.79
2002	19592	1410	72	28	2215	4566	548	67740	1462	7	28331	0.87
2003	18055	3482	66	34	2361	6569	854	69477	2024	9	31321	1.01
2004	15916	2193	74	26	2284	4925	184	68578	1201	7	25503	1.09
2005	16845	3186	63	37	2835	5191	1808	55032	1670	11	29866	0.94
2006	16472	1689	74	26	1887	6279	142	65531	4644	8	26468	1.36
2007	15859	1344	66	34	1698	7876	855	50843	4146	14	27634	1.49
2008	11148	355	69	31	1513	8934	768	42234	3746	17	22717	2.72
2009	7093	341	60	40	1921	8456	474	48438	3328	15	18285	3.00
2010	7641	814	67	33	2287	6479	557	50276	3543	12	17778	2.55
2011	8845	272	75	25	1794	7487	508	50368	3850	13	18907	3.48
2012	8654	349	69	31	2657	8419	556	51225	6795	13	20634	3.20
2013	7742	945	70	30	2029	5226	1305	31355	5020	15	17248	2.48
2014	8099	867	67	33	2485	5439	1268	28909	9627	15	18158	2.25
2015	8372	449	71	29	3161	5047	912	37342	6328	12	17941	2.35
Average 2013–2015			69	31	2558							2.36

*These recreational catches are from Germany only. The values in this column have been reviewed and updated this year.
**Discard estimates updated back in time.

A catch constraint assumption for the intermediate year (2016) has been applied in the short-term forecast to provide catch options for 2107, which is the same procedure used last year. The expected catch in 2016, 10 327 t, is derived by applying the split between eastern and western Baltic cod stocks to the TAC, adjusting for the recent discard rate, and adding the assumed recreational catch. This catch constraint implies an F in 2016 considerably lower than that estimated for recent years in the current assessment. However, other possible intermediate year assumptions (for example, a linear trend in observed F or *status quo* F) imply catches in 2016 which are at least 2700 tonnes higher than the catch constraint option. Based on the available information, ICES found it difficult to justify such a large discrepancy and potential overshoot of the TAC in 2016. Relevant observations include:

i) a reduction in the observed discard rate in 2015 (to approximately 5%), amounting to relatively low quantities of discarded cod,
ii) no change of this magnitude in recent years in the recreational catches not included in the assessment, and
iii) the extended duration of the cod closure and the adjustment in timing to cover the period when cod catches are normally highest is expected to limit catches and contribute to reducing F.

In view of these observations, the catch constraint approach applied for the intermediate year (2016) appears to be the most realistic.

Reference points

Table 8.3.4.6 Cod in subdivisions 22–24 (western Baltic cod). Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Reference
MSY approach	F_{MSY}	0.26	Stochastic simulations with segmented regression stock–recruitment relationship.	ICES (2015a)
	MSY $B_{trigger}$	38 400 t	B_{pa}	ICES (2015b)
Precautionary approach	B_{lim}	27 400 t	Break point of the stock–recruitment relationship.	ICES (2015b)
	B_{pa}	38 400 t	$1.4 \times B_{lim}$	ICES (2015b)
	F_{lim}	1.01	Equilibrium scenarios with stochastic recruitment: F value corresponding to 50% probability of (SSB< B_{lim}).	ICES (2016a)
	F_{pa}	0.74	$F_{lim} \times e^{-1.645\sigma}$; $\sigma = 0.19$	ICES (2016a)
Management plan	SSB_{MGT}	Not defined.		
	F_{MGT}	Not defined.		

Basis of the assessment

Table 8.3.4.7 Cod in subdivisions 22–24 (western Baltic cod). The basis of the assessment and advice.

ICES stock data category	1 (ICES, 2016b)
Assessment type	Age-based analytical assessment (SAM; ICES, 2016a) that uses catches in the model and in the forecast.
Input data	Commercial catches (international landings, ages and length frequencies from catch sampling), recreational catch (only German data included). Two survey indices (BITS-Q1 and BITS-Q4); annual maturity data from BITS-Q1 surveys. Natural mortalities for age 1 derived from multispecies assessment, unchanged since 1996. Annual stock separation key to split catches in Subdivision 24 to eastern and western Baltic cod, derived from otolith shape analyses combined with genetics.
Discards and bycatch	Included in the assessment since 1994, dataseries from the main fleets.
Indicators	None
Other information	Benchmarked in 2015 (ICES, 2015b). The basis for the assessment changed last year to being for the western Baltic cod stock, whereas assessments in earlier years were for the area of subdivisions 22–24.
Working group	Baltic Fisheries Assessment Working Group (WGBFAS)

Information from stakeholders

There is no available information.

History of the advice, catch, and management

Table 8.3.4.8 Cod in subdivisions 22–24 (western Baltic cod). History of ICES advice, the agreed TAC, and ICES estimates of landings by area. Weights in thousand tonnes.

Year	ICES advice	Predicted commercial catch corresponding to advice*	Agreed TAC**	ICES estimated total commercial landings subdivisions 22–24 (eastern and western Baltic cod stocks)
1987	TAC	9		29
1988	TAC	16		29
1989	TAC	14	220	19
1990	TAC	8	210	18
1991	TAC	11	171	17
1992	Substantial reduction in F	-	100	18
1993	F at lowest possible level	-	40	21
1994	TAC	22	60	31
1995	30% reduction in fishing effort from 1994 level	-	120	34
1996	30% reduction in fishing effort from 1994 level	-	165	51
1997	Fishing effort should not be allowed to increase above the level of recent years	-	180	44
1998	20% reduction in F from 1996	35	160	34
1999	At or below F_{sq} with 50% probability	38	126	42
2000	Reduce F by 20%	44.6	105	38
2001	Reduce F by 20%	48.6	105	34
2002	Reduce F to below 1.0	36.3	76	24
2003	Reduce F to below 1.0	22.6–28.8***	75	25
2004	Reduce F to below 1.0	< 29.6	29.6	21
2005	Reduce F to below 0.92	< 23.4	24.7	22
2006	Management plan	< 28.4	28.4	23
2007	Keep SSB at B_{pa}	< 20.5	26.7	24
2008	Rebuild SSB to B_{pa}	< 13.5	19.2	20
2009	Rebuild SSB to B_{pa}	< 13.7	16.3	15.3
2010	Management plan	< 17.7	17.7	14.1
2011	See scenarios	-	18.8	16.3
2012	Management plan	21.3	21.3	17.1
2013	Management plan	20.8	20.0	13.0
2014	Management plan	17.0	17.0	13.5
2015	MSY approach	8.793	15.9	13.4
2016	MSY approach (F = 0.23)	≤ 7.797^	12.70	
2017	MSY approach (F = 0.15)	≤ 0.917^^		

* Values since 2016 are for the western Baltic cod stock, whereas in earlier years they are for the area of subdivisions 22–24 and include a fraction of the eastern Baltic cod stock.
** Included in TAC for total Baltic, until and including 2003.
*** Two options based on implementation of the adopted mesh regulation.
^ Total catch of western Baltic cod stock, including recreational catch.
^^ Commercial catch of western Baltic cod stock, assuming an additional recreational catch of 2558 t.

History of catch and landings

Table 8.3.4.9 Cod in subdivisions 22–24 (western Baltic cod). Catch distribution by fleet in 2015 as estimated by ICES.

Total catch (2015)	Commercial landings		Commercial discards	Recreational catch (partially reported)
12.0 kt	54 % trawl	46% gillnet	0.4 kt	3.2 kt
	8.4 kt			

Table 8.3.4.10 Cod in subdivisions 22–24 (western Baltic cod). History of commercial landings; both the official and ICES estimated values are presented by area for each country participating in the fishery (includes landings of the eastern Baltic cod stock in Subdivision 24). Weights in tonnes.

Year	Denmark			Finland	German Dem. Rep.*	Germany, FRG		Estonia		Lithuania	Latvia	Poland	Sweden			Total				
	22	23	22+24	24	22+24	22	22+24	22	24	24	24	24	22	23	22+24	22	23	24	Unalloc.	Grand total
1965			19457		9705		13350								2182	27867		17007		44874
1966			20500		8393		11448								2110	27864		14587		42451
1967			19181		10007		12884								1996	28875		15193		44068
1968			22593		12360		14815								2113	32911		18970		51881
1969			20602		7519		12717								1413	29082		13169		42251
1970			20085		7996		14589								1289	31363		12596		43959
1971			23715		8007		13482								1419	32119		14504		46623
1972			25645		9665		12313								1277	32808		16092		48900
1973			30595		8374		13733								1655	38237		16120		54357
1974			25782		8459		10393								1937	31326		15245		46571
1975			23481		6042		12912								1932	31867		12500		44367
1976		712	29446		4582		12893								1800	33368	712	15353		49433
1977		1166	27939		3448		11686							550	1516	29510	1716	15079		46305
1978		1177	19168		7085		10852							600	1730	24232	1777	14603		40612
1979		2029	23325		7594		9598							700	1800	26027	2729	16290		45046
1980		2425	23400		5580		6657							1300	2610	22881	3725	15366		41972
1981		1473	22654		11659		11260							900	5700	26340	2373	24933		53646
1982		1638	19138		10615		8060							140	7933	20971	1778	24775		47524
1983		1257	21961		9097		9260							120	6910	24478	1377	22750		48605
1984		1703	21909		8093		11548							228	6014	27058	1931	20506		49495
1985		1076	23024		5378		5523							263	4895	22063	1339	16757		40159
1986		748	16195		2998		2902							227	3622	11975	975	13742		26692
1987		1503	13460		4896		4256							137	4314	12105	1640	14821		28566
1988		1121	13185		4632		4217							155	5849	9680	1276	18203		29159
1989		636	8059		2144		2498							192	4987	5738	828	11950		18516
1990		722	8584		1629		3054							120	3671	5361	842	11577		17780
1991		1431	9383				2879							232	2768	7184	1663	7846		16693
1992		2449	9946				3656							290	1655	9887	2739	5370		17996
1993		1001	8666				4084							274	1675	7296	1275	7129	5528	21228
1994		1073	13831				4023							555	3711	8229	1628	13336	7502	30695
1995		2547	18762	132			9196				15			611	2632	16936	3158	13801		33895
1996		2999	27946	50			12018		50		32			1032	4418	21417	4031	23097	2300	50845
1997		1886	28887	11			9269		6			263		777	2525	21966	2663	18995		43624
1998		2467	19192	13			9722		8		13	623		607	1571	15093	3074	16049		34216

Year	Denmark			Finland	German Dem. Rep.*	Germany, FRG		Estonia		Lithuania	Latvia	Poland	Sweden			Total				
	22	23	22+24	24	22+24	22	22+24	22	24	24	24	24	22	23	22+24	22	23	24	Unalloc.	Grand total
1999		2839	23074	116			13224		10		25	660		682	1525	20409	3521	18225		42155
2000		2451	19876	171			11572		5		84	926		698	2564	18934	3149	16264		38347
2001		2124	17446	191			10579		40		46	646		693	2479	14976	2817	16451		34244
2002		2055	11657	191			7322				71	782		354	1727	11968	2409	9781		24158
2003		1373	13275	59			6775				124	568		551	1899	9573	1925	13127		24624
2004		1927	11386				4651				221	538		393	1727	9091	2320	9430	13	20854
2005		1902	9867	2			7002	72	67		476	1093		720	835	8729	2621	10686	9	22045
2006		1899	9761	242			7516		91		586	801			1855	9979	1914	10858		22751
2007		2169	8975	220			6802		69		273	2371		534	2322	7840	2713	13183		23736
2008		1612	8582	159			5489		134		30	1361		525	2189	5687	2139	12256		20082
2009		567	7871	259			4020		194		23	529		269	1817	3451	839	11259		15549
2010		689	6849	203			4250			9	159	319		490	1151	3925	1179	9016		14120
2011		783	7799	149			4521				24	487		414	2153	5493	1198	9641		16332
2012		733	8381	260			4522		3		11	818		390	1955	4896	1123	11053		17072
2013		580	6566	50			3237				128	708		380	1317	4675	960	7333		12968
2014	2206	795	6804	7		2109	3243				39	854	1	565	1231	4316	1361	7862		13538
2015	2781	738	6623	28		2213	2915				7	755		493	1858	4994	1232	7193		13418

* Includes landings from October to December 1990 of Fed. Rep. Germany.

Summary of the assessment

Table 8.3.4.11 Cod in subdivisions 22–24 (western Baltic cod). Assessment summary with weights in tonnes. Recruitment in thousands.

Year	Recruitment (Age 1)	High	Low	Stock Size: SSB	High	Low	Commercial Landings	Commercial Discards	Fishing Pressure: F (Ages 3–5)	High	Low	Recreational Catch
1994	64408	125668	33011	31825	47247	21437	21409	2069	1.179	1.456	0.955	1828
1995	88876	170904	46219	29852	39601	22503	29854	3143	1.25	1.51	1.035	2133
1996	28854	59993	13877	32958	43445	25003	38335	6897	1.187	1.412	0.998	2190
1997	84711	160537	44700	34235	47892	24472	37009	3994	1.186	1.41	0.998	2280
1998	112533	211792	59793	26876	35044	20612	29628	5577	1.205	1.43	1.016	2372
1999	37272	69264	20057	31508	41555	23890	35817	4390	1.301	1.542	1.097	2243
2000	38025	68379	21145	36279	49496	26592	31653	3794	1.295	1.525	1.1	2386
2001	24077	40957	14154	29115	36826	23018	26983	2456	1.318	1.564	1.111	2494
2002	40015	65532	24433	22652	28686	17887	19592	1410	1.267	1.501	1.07	2215
2003	13830	24172	7913	17304	21391	13998	18055	3482	1.171	1.382	0.993	2361
2004	67373	110955	40910	19262	24909	14896	15916	2193	1.109	1.315	0.935	2284
2005	23885	38880	14673	27092	34236	21439	16845	3186	1.033	1.236	0.863	2835
2006	23342	39322	13856	31888	41533	24484	16472	1689	0.931	1.16	0.746	1887
2007	7088	11598	4331	32273	41338	25196	15859	1344	0.954	1.153	0.789	1698
2008	3028	6129	1496	21868	27329	17499	11148	355	0.995	1.189	0.832	1513
2009	29261	49390	17335	14165	17446	11500	7093	341	1.011	1.209	0.845	1921
2010	11446	18685	7012	13144	16489	10477	7641	814	1.003	1.202	0.837	2287
2011	17408	29511	10269	13478	17952	10119	8845	272	0.969	1.165	0.806	1794
2012	12266	20073	7496	15614	20174	12084	8654	349	0.951	1.156	0.783	2657
2013	32991	55092	19757	12606	15817	10047	7742	945	1.039	1.328	0.813	2029
2014	19776	33266	11756	16602	21029	13107	8099	867	0.94	1.249	0.707	2485
2015	11286	21499	5924	19542	26399	14465	8372	449	0.875	1.28	0.598	3161
2016	1226*	3513*	377*	20737*	34384*	12088*						
Avg.	**34477****	**62396****	**19152****	**23951****	**31749****	**18122****	**19137**	**2273**	**1.099**	**1.335**	**0.906**	**2230**

* Version 3: updated. Predicted from the short-term forecast.

** Version 3: updated.

Sources and references

EU. 2007. Council Regulation (EC) No 1098/2007 of 18 September 2007 establishing a multiannual plan for the cod stocks in the Baltic Sea and the fisheries exploiting those stocks, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 779/97. http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32007R1098.

ICES. 2015a. EU request to ICES to provide F_{MSY} ranges for selected North Sea and Baltic Sea stocks. *In* Report of the ICES Advisory Committee, 2015. ICES Advice 2015, Book 6, Section 6.2.3.1. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2015/Special_Requests/EU_FMSY_ranges_for_selected_NS_and_BS_stocks.pdf.

ICES 2015b. Report of Benchmark Workshop on Baltic Cod Stocks (WKBALTCOD), 2–6 March 2015, Rostock, Germany. ICES CM 2015/ACOM:35. 172 pp.

ICES. 2016a. Report of the Baltic Fisheries Assessment Working Group (WGBFAS), 12–19 April 2016, ICES Headquarters, Copenhagen, Denmark. ICES CM 2016/ACOM:11.

ICES. 2016b. General context of ICES advice. *In* Report of the ICES Advisory Committee, 2016. ICES Advice 2016, Book 1, Section 1.2.