

8.3.15 Plaice (*Pleuronectes platessa*) in subdivisions 21–23 (Kattegat, Belt Sea, Sound)

ICES stock advice

ICES advises that when the MSY approach is applied, catches in 2017 should be no more than 8333 tonnes.

Stock development over time

Spawning-stock biomass (SSB) has increased significantly from 2009 and has been above MSY $B_{trigger}$ since 2011. Fishing mortality (F) has declined since 2000 and has been below F_{MSY} since 2012. Recruitment has been stable in recent years.

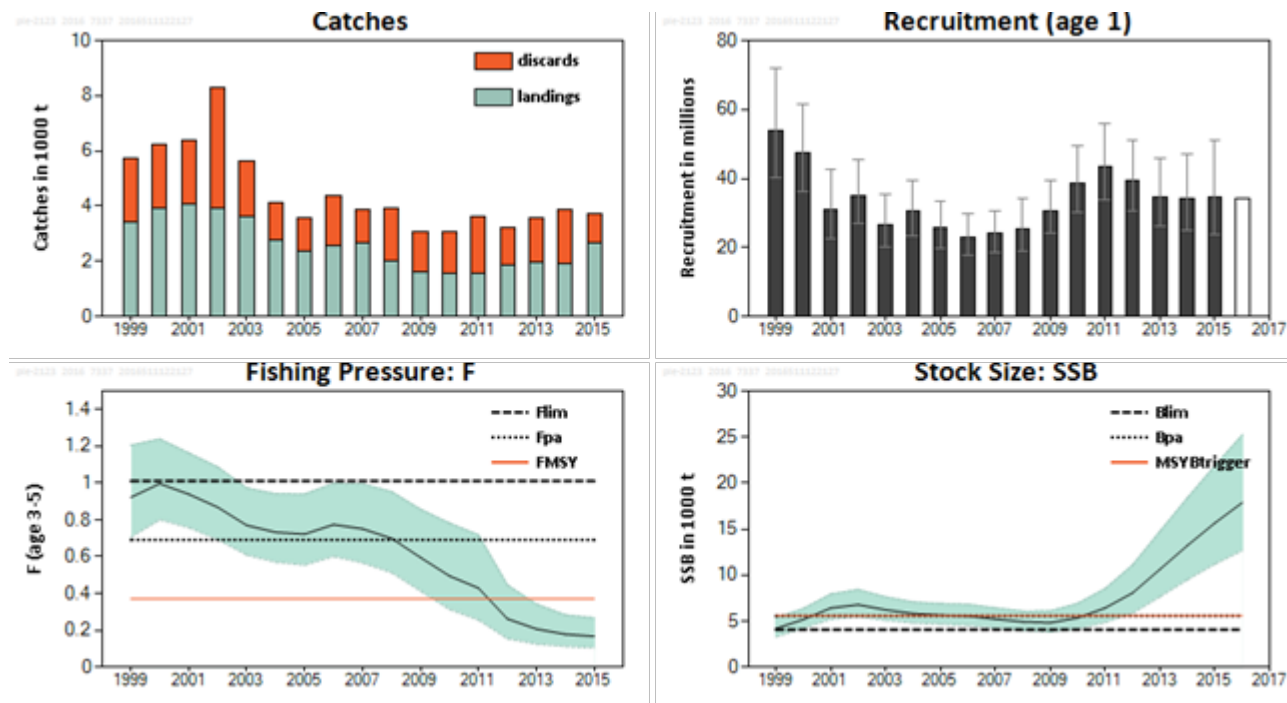


Figure 8.3.15.1 Plaice in subdivisions 21–23. Summary of stock assessment. Catch weights in thousand tonnes. Recruitment, F, and SSB have confidence intervals (95%) in the plot. Predicted values are not shaded.

Stock and exploitation status

Table 8.3.15.1 Plaice in subdivisions 21–23. 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}	✓	✓	✓ Below	MSY	✓	✓ Above $B_{trigger}$
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓ Harvested sustainably	B_{pa}, B_{lim}	✓	✓ Full reproductive capacity
Management plan	F_{MGT}	-	-	- Not applicable	SSB_{MGT}	-	- Not applicable

Catch options

Table 8.3.15.2 Plaice in subdivisions 21–23. The basis for the catch options.

Variable	Value	Source	Notes
F ages 3–5 (2016)	0.17	ICES (2016a)	F_{sq} , SAM estimate
SSB (2017)	20423 t	ICES (2016a)	SSB resulting from F_{sq} assumption
R_{age1} (2017)	34 752 thousands	ICES (2016a)	Sampled from the entire time-series
R_{age1} (2018)	34 372 thousands	ICES (2016a)	Sampled from the entire time-series
Total catch (2016)	3772 t	ICES (2016a)	Catch resulting from F_{sq} assumption
Commercial landings (2016)	2687 t	ICES (2016a)	Based on the observed discard rate by age in 2015
Discards (2016)	1084 t	ICES (2016a)	Based on the observed discard rate by age in 2015

Table 8.3.15.3 Plaice in subdivisions 21–23. The catch options. Weights in tonnes.

Rationale	Catches (2017)	Wanted catch* (2017)	Unwanted catch* (2017)	Basis	F (2017)	SSB (2018)	%SSB change	%Advice change**
MSY approach	8333	6199	2134	F_{MSY}	0.37	19064	-7	-4
Precautionary approach	13667	10169	3498	F_{pa}	0.69	15326	-25	58
Zero catch	0	0	0	0	0	25251	24	-100
Other options	4170	3096	1074	F_{sq} (F_{2016})	0.17	22168	9	-52
	6911	5125	1786	-20% Advice	0.30	20137	-1	-20
	8639	6426	2213	Same advice	0.39	18841	-8	0
	10367	7718	2649	+20% Advice	0.48	17623	-14	20
	17658	13170	4488	F_{lim}	1.01	12584	-38	104
	28023	21018	7005	B_{pa} in 2018	2.71	5558	-73	224
	28023	21018	7005	MSY $B_{trigger}$ in 2018	2.71	5558	-73	224
29724	22275	7449	B_{lim} in 2018	3.41	4479	-78	244	

* “Wanted” and “unwanted” catch are used to describe fish that would be landed and discarded in the absence of the EU landing obligation, based on the observed discard rate by age in 2015.

** Catches in 2017 relative to the ICES advised catch for 2016 (8639 tonnes).

Basis of the advice

Table 8.3.15.4 Plaice in subdivisions 21–23. The basis of the advice.

Advice basis	MSY approach.
Management plan	There is no management plan for plaice in this area. There is a proposed EU management plan for the Baltic Sea where bycatch of this species is considered. The plan has not been formally implemented.

Quality of the assessment

This stock was benchmarked in 2015 (ICES, 2015b). The assessment suffers from a relative short time-series (1999–2015) and the confidence limits are in general quite large.

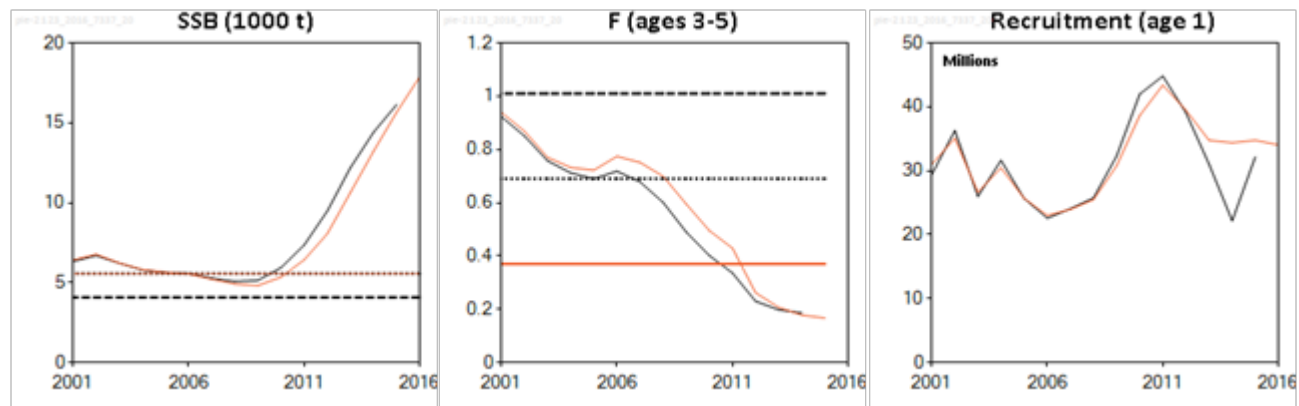


Figure 8.3.15.2 Plaice in subdivisions 21–23. Historical assessment results.

Issues relevant for the advice

New estimates of the reference points F_{lim} and F_{pa} are available this year.

The management areas for plaice in the Baltic Sea (i.e. Subdivision (SD) 21 and SDs 22–32) are different from the stock areas (i.e. SDs 21–23 and 24–32). The following shows an option for calculating TAC by management area based on the catch distribution observed in 2015. The catch ratio between SD 21 and SDs 22–23 in 2015 was used to calculate a split of the advised catches for 2017, and a similar calculation was done for the landings only. The advised catch for the stock in SDs 24–32 (Section 8.3.16) was added to the calculated catch for SDs 22–23 to obtain plaice catches by management area that would be consistent with the ICES advice for the two stocks. This results in catches of no more than 3058 tonnes in SD 21 and 7862 tonnes in SDs 22–32. The corresponding wanted catches would be no more than 2065 tonnes in SD 21 and 5841 tonnes in SDs 22–32.

Table 8.3.15.5 Plaice in subdivisions 21–23. Catch and landings overview and calculation of catches by management area for plaice in subdivisions 21–23 and 24–32.

Basis		Catch 2015	Landings 2015	ICES stock advice 2017 (catch)	ICES stock advice 2017 (corresponding wanted catch)
Stock area based	SDs 21–23	3707 t	2687 t	8333 t	6199 t
	SDs 24–32	647 t	427 t	2587 t	1707 t
Total advised catch and corresponding wanted catch, 2017 (SDs 21–32)				10920 t	7906 t
Management area based	SD 21	1361 t	895 t		
	SDs 22–23	2346 t	1792 t		
	SDs 22–32	2993 t	2219 t		
calculation				results	
Share of SDs 21–23 2015 catch in SD 21		1361 t / 3707 t (catch 2015 SD 21 / catch 2015 SDs 21–23)		0.367	
Catch 2017 for SD 21		8333 t × 0.367 (ICES stock advice 2017 (catch) for SDs 21–23 × share)		3058 t	
Catch 2017 for SDs 22–32		10920 t – 3058 t (total advised catch 2017 SDs 21–32 – catch SD 21)		7862 t	
Share of SDs 21–23 2015 landings in SD 21		895 t / 2687 t (landings 2015 SD 21 / landings 2015 SDs 21–23)		0.333	
Wanted catch 2017 for SD 21		6199 t × 0.333 (ICES stock advice 2017 (wanted catch) for SDs 21–23 × share)		2065 t	
Wanted catch 2017 for SDs 22–32		7906 t – 2065 t (wanted catch 2017 SDs 21–32 – wanted catch SD 21)		5841 t	

Reference points

Table 8.3.15.6 Plaice in subdivisions 21–23. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	5 550 t	= B_{pa}	ICES (2015a)
	F_{MSY}	0.37	Equilibrium scenarios stochastic recruitment.	ICES (2015a)
Precautionary approach	B_{lim}	4 480 t	B_{loss}	ICES (2015a)
	B_{pa}	5 550 t	$B_{lim} \times e^{-1.645\sigma}$, $\sigma = 0.20$	ICES (2015a)
	F_{lim}	1.01	Equilibrium scenarios $prob(SSB < B_{lim}) < 50\%$ with stochastic recruitment	ICES (2016a)
	F_{pa}	0.69	$F_{pa} = e^{-1.645\sigma(F)}$, $\sigma_F = 0.236$	ICES (2016a)
Management plan	SSB_{MGT}	Not defined.		
	F_{MGT}	Not defined.		

Basis of the assessment

Table 8.3.15.7 Plaice in subdivisions 21–23. The basis of the assessment.

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, catch numbers by age, mean weight in catch by age); two survey indices (IBTSQ1 and Q3, BITS–Q1 and Q4); 3-year running mean maturity data (from commercial catch during surveys); natural mortalities are fixed and assumed to be 0.1 except for age 1, which has 0.2. No age 0 included in the assessment.
Discards and bycatch	Discard information available from 1999 from the main fleets (covering 100% of the landings).
Indicators	None
Other information	The stock was last benchmarked in 2015 (ICES, 2015b).
Working group	Baltic Fisheries Assessment Working Group (WGBFAS)

Information from stakeholders

There is no available information.

History of advice, catch and management

Table 8.3.15.8 Plaice in subdivisions 21–23. History of ICES advice, the agreed TAC, and ICES estimates of landings and discards. Weights in thousand tonnes.

Year	ICES advice	Pred. catch corresp. to advice SDs 21–23	Pred. catch corresp. to advice for Skagerrak and Kattegat combined	TAC Kattegat (SD 21)	TAC Baltic Sea (SDs 22–32)	ICES landings (SDs 21–23)	Discards (SDs 21–23)
1992	TAC		14.0	2.8		2.7	
1993	Precautionary TAC		-	2.8		1.7	
1994	If required, precautionary TAC		-	2.8		2.1	
1995	If required, precautionary TAC		-	2.8		2.1	
1996	If required, precautionary TAC		-	2.8		3.5	
1997	No advice		-	2.8		3.4	
1998	No increase in F from the present level		11.9	2.8		2.9	
1999	No increase in F from the present level		11.0	2.8		3.4	2.313
2000	$F < F_{pa}$		11.8	2.8		3.9	2.313
2001	$F < F_{pa}$		9.4	2.35		4.1	2.313
2002	$F < F_{pa}$		8.5*	1.6**		3.9	4.357
2003	$F < F_{pa}$		18.4	3.0		3.4	2.004
2004	$F < F_{pa}^{***}$		***	1.8		2.6	1.368
2005	$F < F_{pa}$		< 9.5	1.9		2.4	1.197
2006	No increase in F		< 9.6	1.9		2.4	1.769
2007	Maintain current TAC		< 9.6	2.1		2.6	1.190
2008	No increase in catch		< 9.4	2.3		2.0	1.901
2009	Same advice as last year		< 9.4	2.3		1.7	1.447
2010	Same advice as last year		< 9.4	2.3		1.5	1.488
2011	Last three years' average landings (2007–2009)		< 8.0	1.988	3.041	1.6	2.045
2012	Reduce catch		-	1.988	2.889	1.8	1.350
2013	Increase catch by 16%, transition to F_{MSY}	< 1.8 [^]		1.8	2.889	2.0	1.637
2014	Increase landings by 20%	2.224 [^]		2.16	3.409	1.931	1.946
2015	Increase catch by 20%	4.031		2.626	3.409	2.687	1.021
2016	MSY approach	≤ 8.639		2.347	4.034		
2017	MSY approach	≤ 8.333					

*In March 2002 ACFM revised its advice to 11.6 for both areas combined.

**The TAC for the two areas combined was adjusted to 11 200 tonnes in mid-2002.

***The exploitation of this stock should be conducted in the context of mixed fisheries.

[^]Landings.

History of catch and landings

Table 8.3.15.9 Plaice in subdivisions 21–23. Catch distribution by fleet in 2015 as estimated by ICES.

Total catch (2015)	Landings		Discards
	73 % active gears	27 % passive gears	
3707 t	2687 t		1021 t (100% from active gears)

Table 8.3.15.10 Plaice in subdivisions 21–23. History of ICES landings and ICES estimates of discards presented by area and country. Weights in tonnes.

Year/SD	SD 21			SD 22			SD 23		Total landing	Total discard
	Denmark	Germany	Sweden	Denmark	Germany	Sweden	Sweden	Denmark		
1970				3757	202					
1971				3435	160					
1972	15504	77	348	2726	154				18809	
1973	10021	48	231	2399	165				12864	
1974	11401	52	255	3440	202				15350	
1975	10158	39	296	2814	313				13620	
1976	9487	32	177	3328	313				13337	
1977	11611	32	300	3452	353				15748	
1978	12685	100	312	3848	379				17324	
1979	9721	38	333	3554	205				13851	
1980	5582	40	313	2216	89				8240	
1981	3803	42	256	1193	80				5374	
1982	2717	19	238	716	45				3735	
1983	3280	36	334	901	42				4593	
1984	3252	31	388	803	30				4504	
1985	2979	4	403	648	94				4128	
1986	2470	2	202	570	59				3303	
1987	2846	3	307	414	18				3588	
1988	1820	0	210	234	10				2274	
1989	1609	0	135	167	7				1918	
1990	1830	2	202	236	9				2279	
1991	1737	19	265	328	15				2364	
1992	2068	101	208	316	11				2704	
1993	1294	0	175	171	16		2		1658	
1994	1547	0	227	355	1		6		2136	
1995	1254	0	133	601	75		12	64	2139	
1996	2337	0	205	859	43	1	13	81	3539	
1997	2198	25	255	902	51		13		3444	
1998	1786	10	185	642	213		13		2849	
1999	1510	20	161	1456	244	1	13		3405	2313
2000	1644	10	184	1932	140		26		3936	2313
2001	2069		260	1627	58		39		4053	2313
2002	1880	0	204	1699	39	0	75	42	3939	4357
2003	2132	0	253	1071	31	0	105	26	3618	2004
2004	1454	0	137	949	54	0	137	35	2766	1368
2005	1145	0	100	874	48	0	152	34	2354	1197
2006	1400	0	175	742	45	0	180	39	2580	1769
2007	1244	0	172	933	75	0	199	69	2691	1190
2008	899	0	137	735	92	0	120	45	2028	1901
2009	589	0	84	585	191	0	144	42	1635	1447
2010	428	5	66	775	221	0	59	17	1570	1488
2011	327	0	40	851	310	0	46	11	1584	2045
2012	196	0	30	1189	365	0	54	12	1845	1350
2013	232	1	60	1252	319	0	76	14	1956	1637
2014	343	1	68	1097	320	0	45	57	1931	1946
2015	807	0	87	1103	560	0	103	26	2687	1021

Summary of the assessment

Table 8.3.15.11 Plaice in subdivisions 21–23. Assessment summary with weights (in tonnes). Recruitment in thousands.

Year	Recruitment (age 1)	High	Low	Stock size: SSB	High	Low	Landings	Discards	Fishing pressure: F (ages 3–5)	High	Low
1999	53852	71863	40355	4181	5339	3275	3406	2313	0.922	1.205	0.705
2000	47335	61627	36357	5164	6358	4194	3935	2313	0.996	1.239	0.8
2001	30977	42600	22525	6414	7927	5190	4054	2313	0.939	1.163	0.758
2002	35066	45386	27093	6771	8421	5444	3939	4357	0.868	1.087	0.692
2003	26635	35420	20030	6219	7623	5074	3618	2004	0.77	0.973	0.609
2004	30455	39454	23508	5814	7068	4783	2766	1369	0.732	0.941	0.57
2005	25694	33290	19831	5652	6887	4638	2354	1197	0.722	0.94	0.554
2006	23017	29908	17714	5542	6819	4504	2580	1770	0.774	0.998	0.601
2007	23957	30742	18669	5211	6422	4228	2691	1191	0.751	0.995	0.566
2008	25463	34002	19069	4913	6077	3972	2028	1902	0.699	0.953	0.513
2009	30761	39386	24025	4816	6089	3808	1635	1448	0.595	0.857	0.413
2010	38638	49567	30119	5344	6917	4128	1570	1489	0.495	0.782	0.313
2011	43391	56050	33591	6423	8524	4841	1584	2045	0.429	0.718	0.256
2012	39458	51121	30456	8053	11102	5841	1845	1351	0.262	0.446	0.154
2013	34752	45983	26265	10630	14774	7648	1956	1638	0.207	0.342	0.125
2014	34372	47095	25086	13218	18405	9492	1931	1946	0.178	0.283	0.112
2015	34752	51131	23620	15659	21901	11196	2687	1021	0.167	0.267	0.104
2016	34034*			17876**	25249**	12656**					
Average	34034	44978	25783	7661	10106	5828	2622	1863	0.618	0.835	0.461

*Geometric mean (1999–2015).

** Predicted.

Sources and references

ICES 2015a. Report of the Baltic Fisheries Assessment Working Group (WGBFAS), 14–21 April 2015, ICES Headquarters, Copenhagen, Denmark. ICES CM 2015/ACOM:10. 826 pp.

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