



8.4.11

Advice May 2013

ECOREGION

Baltic Sea



STOCK

Plaice in Subdivisions 21-23 (Kattegat, Belts and Sound)

Advice for 2014

Based on ICES approach to data-limited stocks, ICES advises that landings should be no more than 2224 tonnes. Discards are known to take place but the data are insufficient to estimate a discard proportion that could be applied to give catch advice; therefore, total catches cannot be calculated.

Stock status

F (Fishing Mortality)	
2010–2012	
Qualitative evaluation	 Below provisional ref. point
SSB (Spawning-Stock Biomass)	
2009–2013	
Qualitative evaluation	 Increasing

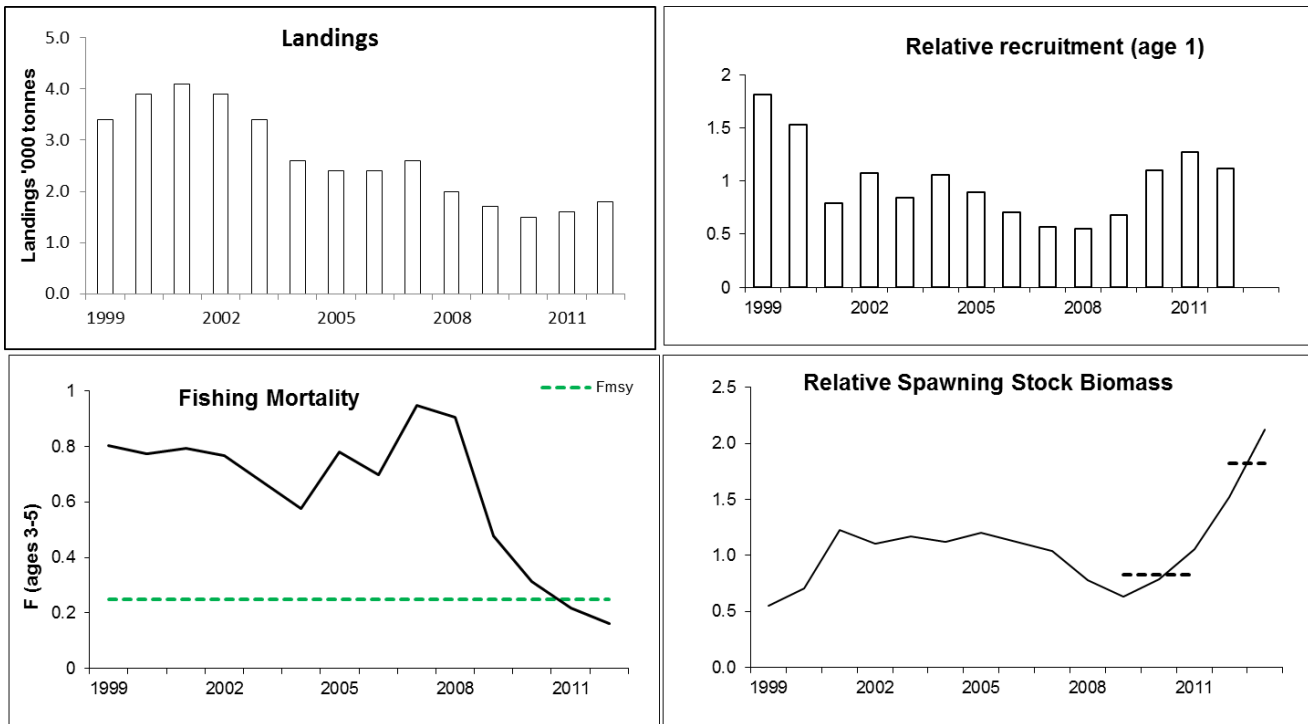


Figure 8.4.11.1 Plaice in Subdivisions 21, 22, and 23 (Kattegat, Belts, and Sound). Summary of stock assessment (landings weights in thousand tonnes). Recruitment and SSB are relative to the mean of the time-series. The dashed lines in SSB indicate the average values of the respective years.

The exploratory assessment shows that fishing mortality has dropped since 2006, and SSB has been increasing since 2009. The SSB in the last two years (2011–2012) is 76% higher than the average of the three previous years (2008–2010). Fishing mortality is below FMSY proxy.

Management plans

No specific management objectives are known to ICES.

Biology

Plaice aggregate at spawning grounds in the first quarter of the year. Stock boundaries are not well understood, due to potentially large connectivity between areas occurring through spawning migration, larval drift, and juvenile homing.

Environmental influence on the stock

Growth patterns for plaice in this area are highly variable, likely because of the great diversity of the local hydrographical conditions in the Kattegat, the Sound, and the Belt Sea.

The fisheries

Plaice is caught all year round, mainly from winter to spring. In Subdivision (SD) 22 plaice are mostly taken in mixed fisheries together with cod. In SD 21 plaice is almost exclusively a bycatch in the combined *Nephrops*–sole fishery. Information on discard ratios in SDs 21–23 is around 15–25% in weight. Discards peak in the Kattegat from 1st of February to 30th April, when landing of mature females is prohibited.

Catch distribution	Total landings (2012) = 1845 tonnes (65% active gears and 33% passive gears). Total discard is around 800 tonnes, predominately from active gears.
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Quality considerations

Some uncertainty in the catch-at-age information and the lack of compiled discard data series make it difficult to conduct a robust assessment. The methods applied to derive quantitative advice for data-limited stocks are expected to evolve as they are further developed and validated.

Scientific Basis

Assessment type	Exploratory age-based analytical assessment (SAM).
Stock data category	Category 3.1.0
Input data	Commercial catches (international landings, catch numbers by age, mean weight in catch by age); four survey indices (IBTS Q1&3, BITS Q1&Q4); annual maturity data (from commercial catch during surveys); natural mortalities are fixed and assumed to be 0.2.
Discards and bycatch	Discards are not included since no time-series is available, but they are considered significant.
Indicators	None.
Other information	The stock is planned to be benchmarked in 2014.
Expert Group report	WGBFAS

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Supporting information May 2013

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Reference points

	<i>Type</i>	<i>Value</i>	<i>Technical basis</i>
MSY Approach	MSY B _{trigger}	Undefined.	
	F _{MSY}	0.25	F _{MSY} proxy from neighbouring North Sea stock. Since selectivity in Kattegat is towards larger fish (discards are considerably lower) this proxy is considered conservative and in the range of other possible proxies.
Precautionary approach	Not defined.		

(Unchanged since: 2012)

Outlook for 2014

No reliable forecast can be presented for this stock, because the assessment is only indicative of trends and the absolute level of stock size is uncertain.

ICES approach to data-limited stocks

For data-limited stocks with biomass and fishing mortality information, ICES uses as harvest control rule an index-adjusted status quo catch, further modified so as to reach the F_{MSY} proxy in 2015. The advice is based on a comparison of the two most recent biomass index values with the three preceding values, combined with recent catch or landings data, and subsequently multiplied by the appropriate ratio of values of F.

For this stock, the biomass estimated from the exploratory assessment is estimated to have increased by 76% between the average of 2009–2011 (three years) and the average of 2012–2013 (two years). The fishing mortality in 2012 is estimated to be 0.16; the fishing in 2014 could therefore be increased by 56% to explore the stock at F_{MSY}. Since the product of 1.16 and 1.56 (SSB and fishing mortality increase) is larger than 1.2, this implies an increase of landings of at most 20% in relation to last year's landings, corresponding to landings in 2013 of no more than 2224 t. Discards are known to be substantial, but the data are insufficient to estimate a discard proportion that could be applied to give catch advice.

Management plan

Additional considerations

Management considerations

The flatfish benchmark group (ICES, 2010) recommended exploring the potential to perform an integrated assessment of the continuum of plaice stocks from the Baltic to the English Channel. ICES evaluated the stock identity of plaice in the Skagerrak and Kattegat (ICES, 2012a, 2012b), for which combined advice has been given until 2011. Adjacent waters, such as the North Sea in the west and the Belts and Sound in the east are taken into account, based on known migration of local components between their spawning and feeding grounds. Although work on stock identity is still under development, the collected information on biology and fishery of plaice in Division IIIa and adjacent waters is considered to imply changes in assessment units as well as in management areas. This assessment is only the second attempt to carry out an analytical assessment as basis for a biomass indices-based trend analysis on plaice in SDs 21–23. Therefore, it is to be considered as an exploratory assessment with room for improvements until the data foundation is more complete.

ICES recommends amending the management areas to match the new stock definition. Based on information on biology and fishery of plaice ICES decided that the plaice from Subdivisions 22 (the Belt Sea) and 23 (the Sound), which were previously assumed to be part of the Baltic Sea stock, should be considered a separate stock unit together with Subdivision 21 (Kattegat) (ICES, 2012c). Plaice in Subdivisions 21–23 was therefore considered to be one stock.

Regulations and their effects

Implementation of a number of changes in the regulatory systems in the Kattegat between 2007 and 2008 as well as continuous reductions in the allowed days-at-sea to protect Kattegat cod have also significantly changed the fishing patterns of the Danish and Swedish fleets since the early 2000s. To decrease discards of cod, a "Bacoma" codend with a 120 mm mesh was introduced by the International Baltic Sea Fisheries Commission (IBSFC) in 2001 in parallel to an increase in diamond mesh size to 130 mm in traditional codends. In October 2003, the regulation was changed to a 110 mm "Bacoma" window. On 1 January 2010 the "Bacoma" 120 mm was re-introduced along with an extended "Bacoma" window (5.5 m).

The plaice fisheries in the western Baltic have been regulated since 2009 by a seasonal closure from 1st of February to 30th of April, when landing of mature females is prohibited.

Uncertainties in the assessment and forecast

No historical discard information is available, but discards are considered to be significant.

Comparison with previous assessment and advice

The stock structure of plaice in the Skagerrak and Kattegat area was revised last year (ICES, 2012c). This is only the second time an assessment is produced for plaice in the Kattegat, Sound, and Belt Sea. Previously the advice was given together with the Skagerrak plaice.

The basis for the advice this year is the same as last year, ICES approach to data-limited stocks using the results of an exploratory assessment.

Assessment and management area

Sources

ICES. 2010. Report of the Benchmark Workshop on Flatfish (WKFLAT), 25 February–4 March 2010, Copenhagen, Denmark. ICES CM 2010/ACOM:37.

ICES. 2012a. Report of the Stock Identification Methods Working Group (SIMWG), 14–16 May 2012, Manchester, UK. ICES CM 2012/SSGSUE:04. 48 pp.

ICES. 2012b. Report of the Workshop on the Evaluation of Plaice Stocks (WKPESTO), 28 February–1 March 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:32.

ICES. 2012c. Report of the Advisory Committee 2012, Baltic Sea. ICES Advice, 2012. Book 8.

ICES. 2013. Report of the Baltic Fisheries Assessment Working Group (WGBFAS), 10–17 April 2012, ICES Headquarters. ICES CM 2013/ACOM:10.

Table 8.4.11.1 Plaice in Subdivisions 21, 22, and 23 (Kattegat, Belts, and Sound). ICES advice, management, and landings. NB: up until 2012, advice was given for Skagerrak and Kattegat combined.

Year	ICES Advice	Predicted catch corresp. to advice Kattegat, Belts, and Sound	Predicted catch corresp. to advice for Skagerrak and Kattegat combined	TAC Kattegat (SD 21)	TAC Baltic Sea (SDs 22 – 32)	ICES landings
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
2000	F F_{pa}		11.8	2.8		3.9
2001	F < F_{pa}		9.4	2.35		4.1
2002	F < F_{pa}		8.5 ¹	1.6 ²		3.9
2003	F < F_{pa}		18.4	3.0		3.4
2004	F < F_{pa} ³		3	1.8		2.6
2005	F < F_{pa}		< 9.5	1.9		2.4
2006	No increase in F		< 9.6	1.9		2.4
2007	Maintain current TAC		<9.6	2.1		2.6
2008	No increase in catch		<9.4	2.3		2.0
2009	Same advice as last year		<9.4	2.3		1.7
2010	Same advice as last year		<9.4	2.3		1.5
2011	Last three years average landings (2007–2009)		<8.0	2.0	3.041	1.6
2012	Reduce catch		-		2.889	
2013	Increase catch by 16%, transition to F_{MSY} proxy for data-limited stocks by 2015	<1.8		2.0	2.889	1.8
2014	Increased landings by 20%	2.224				

Weights in thousand tonnes.

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

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

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

Table 8.4.11.2 Plaice in Subdivisions 21, 22, and 23 (Kattegat, Belts, and Sound). ICES estimates of landings by country in tonnes.

SD Year/Country	21			22			23		Total
	Denmark	Germany	Sweden	Denmark	Germany	Sweden	Sweden	Denmark	
1970				3757	202				3959
1971				3435	160				3595
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
2000	1644	10	184	1932	140		26		3936
2001	2069		260	1627	58		39		4053
2002	1806	26	198	1759	46		42		3877
2003	2037	6	253	1024	35	0	26		3381
2004	1395	77	137	911	60		35		2615
2005	1104	47	100	908	51		35	145	2390
2006	1355	20	175	600	46		39	166	2401
2007	1198	10	172	894	63		69	193	2599
2008	866	6	136	750	92	0	45	116	2011
2009	570	5	84	633	194	0	42	139	1668
2010	428	3	66	748	221	0	17	57	1541
2011	328	0	40	851	310		11	46	1586
2012 ¹	196	0	30	1189	365	7	12	54	1853

¹ Preliminary

Table 8.4.11.3 Plaice in Subdivisions 21, 22, and 23 (Kattegat, Belts, and Sound). Summary of the assessment: Recruitment, total stock biomass (TSB) and SSB are relative to the mean of the time-series. Average fishing mortality for ages 3 to 5 (F3–5).

Year	Relative recruit.	Relative TSB	Relative SSB	F(3–5)
1999	1.817	0.617	0.553	0.81
2000	1.533	0.814	0.705	0.78
2001	0.795	1.315	1.223	0.79
2002	1.071	1.103	1.103	0.77
2003	0.845	1.166	1.165	0.67
2004	1.057	1.086	1.123	0.58
2005	0.892	1.183	1.203	0.78
2006	0.705	1.090	1.120	0.70
2007	0.568	0.986	1.036	0.95
2008	0.554	0.738	0.779	0.91
2009	0.680	0.612	0.632	0.48
2010	1.098	0.775	0.783	0.31
2011	1.273	1.046	1.055	0.22
2012	1.114	1.468	1.518	0.16