

Flounder (*Platichthys flesus*) in Subarea 4 and Division 3.a (North Sea, Skagerrak and Kattegat)

ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches should be no more than 1650 tonnes. If discard rates do not change from the average of the last three years (2018–2020), this implies landings of no more than 1171 tonnes in each of the years 2022 and 2023.

Stock development over time

Fishing pressure on the stock is below $F_{MSYproxy}$ (Figure 2); no reference points for stock size have been defined for this stock.

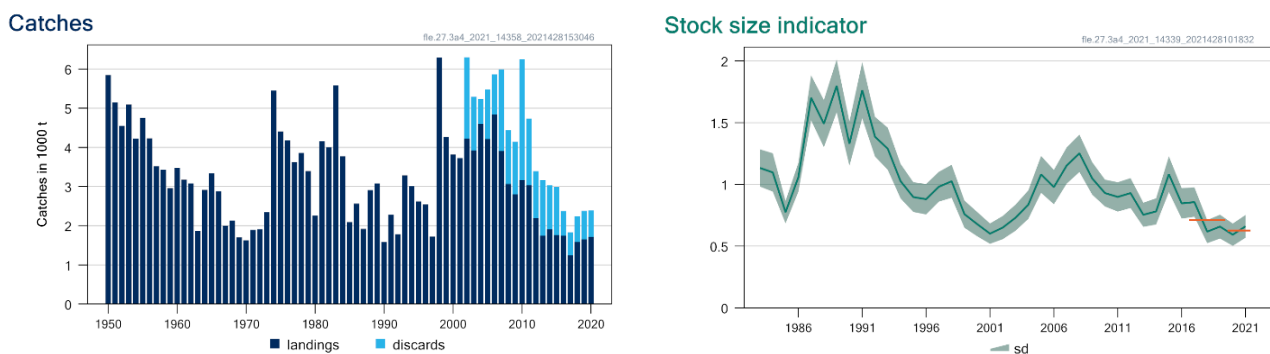


Figure 1 Flounder in Subarea 4 and Division 3.a. Summary of the stock assessment. Between 1984 and 1997, Dutch landings were not recorded. Discard data are only available from 2002. Stock size indicator (in relative biomass) from the North Sea International Bottom Trawl Survey Q1 (NS-IBTS). The horizontal orange lines indicate the average of the most recent two years and the previous three years.

Catch scenarios

ICES framework for category 3 stocks was applied (ICES, 2012). The first quarter International Bottom Trawl Survey (NS-IBTS) was used as the index of stock development. The advice is based on the ratio of the mean of the last two index values (index A) and the mean of the three preceding values (index B), multiplied by the recent average catches.

The index is estimated to have decreased by less than 20% and thus the uncertainty cap was not applied.

The precautionary buffer was never applied before for this stock. Fishing pressure is below the $F_{MSYproxy}$ reference point (Figure 2); however, stock status in relation to reference points is unknown and therefore the precautionary buffer was applied.

Discarding rate is 29% of total catch.

Table 1 Flounder in Subarea 4 and Division 3.a. The basis for the catch options.*

Index A (2020–2021)		0.63
Index B (2017–2019)		0.71
Index ratio (A/B)		0.88
Uncertainty cap	Not applied	-
Average catch for 2018–2020		2340 tonnes
Discard rate (2018–2020)		29%
Precautionary buffer	Applied	0.8
Catch advice**		1650 tonnes
Landings corresponding to the catch advice***		1171 tonnes
% Advice change		-^

* The figures in the table are rounded. Calculations were done with unrounded inputs, and computed values may not match exactly when calculated using the rounded figures in the table.

** Average catch × (index ratio × precautionary buffer)

*** Average catch × (index ratio × precautionary buffer) × (1 – discard rate)

^ No catch advice was given since 2017.

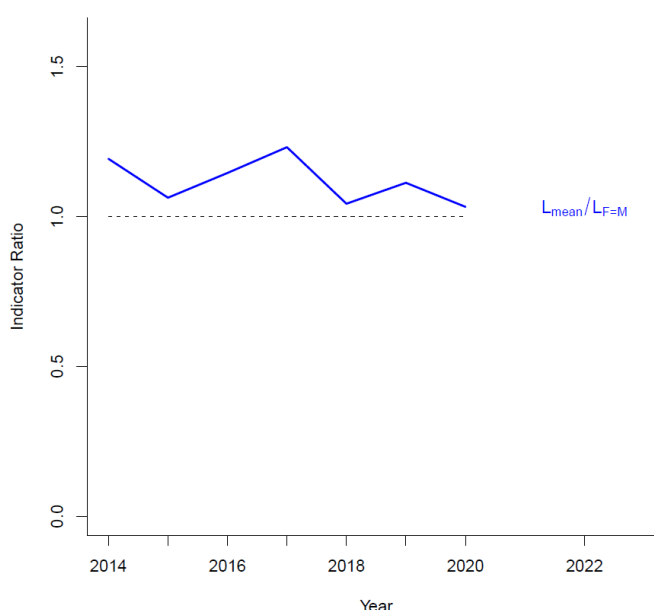


Figure 2 Flounder in Subarea 4 and Division 3.a. The index ratio $L_{\text{mean}}/L_{F=M}$ from the length-based indicator (LBI; ICES, 2017a) method is used for the evaluation of the exploitation status. The exploitation status is below the $F_{\text{MSY proxy}}$ when the index ratio value is higher than 1.

Basis of the advice

Table 2 Flounder in Subarea 4 and Division 3.a. The basis of the advice.

Advice basis	Precautionary approach
Management plan	ICES is not aware of any agreed precautionary management plan for flounder in this area

Quality of the assessment

Discard information is available for the years 2002–2020 for the most important fisheries. However, no reliable data on discards are available for beam trawlers targeting brown shrimp. As most of the fishing effort of this fleet takes place in the coastal zone, which is the main distribution area of flounder, the discarding in these fisheries may have a considerable impact on the stock.

Issues relevant for the advice

Flounder is mainly a bycatch species in the demersal fisheries in coastal areas of the North Sea. Large effort reductions of about 60% in beam and otter trawl fisheries took place in the period 2003–2015 (STECF, 2016). The discard rate of the most recent three years was 29% of the total catch. Survival rates of discards are unknown.

In 2017, ICES advised that the risk of having no catch limits for the dab and flounder stocks was considered to be low and not inconsistent with the objectives of the Common Fisheries Policy (CFP [ICES, 2017b]). Dab and flounder are no longer managed under a TAC. ICES stated that this advice was valid as long as both species remained largely bycatch species, with the main fleets catching dab and flounder continuing to fish the target species (plaice and sole) sustainably within the F_{MSY} ranges provided by ICES. If this situation changes, or if flounder is no longer within safe biological limits, the advice to remove the TAC on flounder would need to be reconsidered.

Reference points

Table 3 Flounder in Subarea 4 and Division 3.a. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$ proxy	Not defined		
	F_{MSY} proxy	$\frac{L_{mean}}{L_{F=M}} = 1$ *	Relative value from LBI analysis, assuming $M/K = 1.5$. $L_{F=M}$ is based on L_c (Length at 50% of modal abundance) which varies each year.	ICES (2018)
Precautionary approach	B_{lim}	Not defined		
	B_{pa}	Not defined		
	F_{lim}	Not defined		
	F_{pa}	Not defined		
Management plan	SSB_{mgt}	Not defined		
	F_{mgt}	Not defined		

* No reference points are defined for this stock in terms of absolute values. The LBI-estimated values of the ratio $L_{mean}/L_{F=M}$ are used to estimate exploitation status relative to the proxy MSY reference point.

Basis of the assessment

Table 4 Flounder in Subarea 4 and Division 3.a. Basis of the assessment and advice.

ICES stock data category	3 (ICES, 2021a)
Assessment type	Survey trends-based assessment (ICES, 2021b)
Input data	Catch statistics, catch length distributions, one survey index (delta GAM NS-IBTS Q1 [G1022])
Discards and bycatch	Discards were quantified for the years 2002–2020. Discards ranged between 12% and 49% of the total catch. Discard estimates were provided for an average of 86% of the landings in 2019–2020. Estimated discards were on average 29% of catches in 2019–2020.
Additional indicators	Length-based indicators
Other information	None
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)

History of the advice, catch, and management

Table 5 Flounder in Subarea 4 and Division 3.a. History advice, TACs, official landings and ICES estimated catch. All weights are in tonnes.

Year	ICES advice	Corresponding to advice		Agreed TAC* in 2.a and 4, dab and flounder	Official landings in 4 and 3.a		ICES landings in 4 and 3.a, flounder	ICES discards in 4 and 3.a, flounder	ICES total catch in 4 and 3.a, flounder
		Landings	Catches		Dab and flounder	Flounder			
2006		-	-	17100	14923	5009	4837	1026	5863
2007		-	-	17100	14192	4065	3908	2082	5990
2008		-	-	18810	11791	3240	3067	1376	4443
2009		-	-	18810	10148	3088	2804	1342	4146
2010		-	-	18810	11195	3365	3166	3087	6253
2011		-	-	18434	10565	3193	3041	1694	4735
2012	No increase in catch	-	-	18434	9059	2310	2189	1205	3394
2013	No new advice, same as for 2012	-	-	18434	7960	1876	1750	1415	3165
2014	No more than 7% increase in landings	< 3160**	-	18434	7024	2067	1907	1127	3034
2015	No new advice, same as for 2014	< 3160**	-	18434	6425	1913	1762	1228	2990
2016	Precautionary approach (increase catches by no more than 20%)		< 5228***	18434	6692	1737	1750	628	2378
2017	Precautionary approach (same advised catch value as given for 2016)		< 5228***	no TAC		1343	1244	588	1832
2018	Precautionary approach (increase catches by no more than 20%)		< 6274	-		1590	1587	657	2244
2019	Precautionary approach (increase catches by no more than 20%)		< 6274	-		1668^	1653	727	2380
2020	No catch advice requested		-	-		1767^	1715	679	2394
2021	No catch advice requested		-	-					
2022	Precautionary approach		≤ 1650						
2023	Precautionary approach		≤ 1650						

* EU combined TAC for dab and flounder in EU waters of 2.a and 4.

** Advice based on landings.

*** Advice based on recent three years' average catch.

^ Preliminary.

History of the catch and landings

Table 6 Flounder in Subarea 4 and Division 3.a. Catch distribution by fleet in 2020 as estimated by ICES.

Catch (2020)	Landings				Discards
	Beam trawl 84%	Gillnets 7%	Otter trawl 7%	Others 2%	
2394 tonnes	1715 tonnes				679 tonnes

Table 7 Flounder in Subarea 4 and Division 3.a. History of commercial catch and landings; the official estimates (1950–2020) and ICES estimates (2012–2020) are presented by area for each country participating in the fishery. All weights are in tonnes.

Subarea 4: official landings

Year	Belgium	Denmark	France	Germany	Netherlands	Norway	UK	Other	Total
1950	67	1514	0	641	937	0	67	241	3467
1951	119	1143	0	329	949	0	81	127	2748
1952	91	1210	0	257	841	0	71	186	2656
1953	270	1372	0	397	886	0	92	203	3220
1954	142	1225	0	281	696	0	71	121	2536
1955	145	1244	0	353	871	0	88	109	2810
1956	132	1389	0	277	1097	0	102	2	2999
1957	81	910	0	250	825	0	112	0	2178
1958	99	784	0	257	1088	0	94	0	2322
1959	62	533	0	424	857	0	79	1	1956
1960	82	614	0	540	733	0	49	8	2026
1961	68	776	0	390	579	0	81	13	1907
1962	37	1146	0	313	717	0	53	2	2268
1963	16	501	0	263	467	0	65	0	1312
1964	30	1141	0	305	563	0	48	6	2093
1965	121	1349	0	248	549	0	54	3	2324
1966	32	946	0	229	573	0	71	2	1853
1967	43	540	0	193	331	0	57	25	1189
1968	75	894	0	152	160	0	43	1	1325
1969	54	582	0	158	161	0	33	0	988
1970	50	316	0	135	405	0	57	0	963
1971	60	685	0	173	297	0	70	0	1285
1972	63	991	0	159	275	0	60	0	1548
1973	63	290	0	172	1424	0	53	0	2002
1974	115	766	0	190	2661	0	58	0	3790
1975	68	437	0	155	2191	0	87	1	2939
1976	94	575	0	209	2077	0	70	54	3079
1977	107	320	0	208	1732	0	127	11	2505
1978	122	203	0	198	1519	0	169	0	2211
1979	129	181	31	275	1260	0	201	0	2077
1980	190	300	33	229	806	0	140	0	1698
1981	164	669	14	200	1068	0	133	0	2248
1982	110	630	31	200	1597	0	121	0	2689
1983	88	564	36	197	2059	0	125	0	3069
1984	272	518	15	103	0	0	122	0	1030
1985	163	379	14	128	0	0	109	0	793
1986	155	456	1	91	0	0	111	0	814
1987	132	394	32	106	0	0	90	0	754
1988	160	509	44	105	682	0	98	0	1598
1989	200	632	28	95	916	0	80	0	1951
1990	153	467	69	147	0	0	45	0	881
1991	260	377	51	902	0	0	69	0	1659
1992	152	492	35	521	0	0	76	0	1276
1993	194	1812	47	356	0	0	136	0	2545
1994	196	642	57	921	0	0	247	0	2063
1995	301	628	103	843	0	0	250	0	2125

Year	Belgium	Denmark	France	Germany	Netherlands	Norway	UK	Other	Total
1996	262	1439	68	43	0	0	193	0	2005
1997	110	988	10	25	0	0	157	0	1290
1998	283	154	40	13	4938	0	132	0	5560
1999	326	123	0	11	3158	0	54	0	3672
2000	289	100	46	17	2656	5	52	0	3165
2001	241	92	42	4	2608	3	32	0	3022
2002	165	83	51	2	3531	3	55	0	3890
2003	206	94	33	3	3172	9	120	0	3637
2004	335	96	46	5	3720	18	74	0	4294
2005	241	171	17	5	3363	38	111	0	3946
2006	168	152	19	2	4020	39	216	0	4616
2007	298	166	56	45	2925	11	119	0	3620
2008	306	228	30	39	2231	3	57	0	2894
2009	272	273	38	46	2124	3	59	0	2815
2010	251	126	20	58	2612	6	87	0	3160
2011	262	112	17	25	2566	1	65	0	3048
2012	348	100	11	23	1672	0	38	0	2192
2013	346	93	13	28	1199	0	24	0	1703
2014	376	107	15	30	1314	0	31	0	1873
2015	277	97	19	19	1409	0	0	0	1836
2016	194	87	20	27	1277	0	25	0	1630
2017	97	101	0	28	944	1	14	0	1185
2018	102	114	0	24	1139	1	18	0	1398
2019 *	94	136	9	48	1186	19	15	0	1507
2020 *	154	114	7	48	1280	30	18	0	1651

* Preliminary catch statistics.

Subarea 4: ICES estimates of landings and discards

Year	Landings	Discards
2002	3690	1115
2003	3447	800
2004	4122	612
2005	3728	946
2006	4445	811
2007	3472	1195
2008	2727	1176
2009	2535	958
2010	2965	2680
2011	2899	721
2012	2072	954
2013	1579	1073
2014	1714	420
2015	1685	954
2016	1644	544
2017	1090	335
2018	1395	362
2019	1493	573
2020	1600	558

Division 3.a: Official landings

Year	Denmark	Germany	Netherlands	Norway	Sweden	Total
1950	1632	92	0	0	657	2381
1951	1548	88	0	0	759	2395
1952	1161	48	0	0	683	1892
1953	1135	17	0	0	724	1876
1954	1138	13	0	0	528	1679
1955	1265	11	0	0	667	1943
1956	1229	6	0	0	0	1235
1957	1331	12	0	0	0	1343
1958	1099	12	0	0	0	1111
1959	1003	3	0	0	0	1006
1960	875	10	0	0	566	1451
1961	821	9	0	0	442	1272
1962	812	3	0	0	0	815
1963	554	0	0	0	0	554
1964	822	1	0	0	0	823
1965	1016	0	0	0	0	1016
1966	1027	0	0	0	0	1027
1967	811	3	0	0	0	814
1968	808	2	0	0	0	810
1969	721	0	0	0	0	721
1970	667	0	0	0	0	667
1971	611	1	0	0	0	612
1972	365	0	0	0	0	365
1973	346	0	0	0	0	346
1974	1656	2	0	0	0	1658
1975	1377	1	0	0	89	1467
1976	949	2	4	0	144	1099
1977	1036	0	19	0	64	1119
1978	1560	10	14	0	64	1648
1979	1219	0	0	0	100	1319
1980	426	0	0	0	135	561
1981	1831	0	0	0	74	1905
1982	1236	0	0	0	75	1311
1983	2352	0	0	0	160	2512
1984	2463	0	0	0	283	2746
1985	1203	0	0	0	102	1305
1986	1585	0	0	0	166	1751
1987	1050	0	0	0	119	1169
1988	1164	0	0	0	149	1313
1989	996	0	0	0	133	1129
1990	650	1	0	0	57	708
1991	574	0	0	0	50	624
1992	455	0	0	0	52	507
1993	673	3	0	0	67	743
1994	865	1	0	0	77	943
1995	403	19	0	0	76	498
1996	429	9	0	0	104	542
1997	367	2	0	0	68	437
1998	637	5	0	0	83	725
1999	558	6	0	0	24	588
2000	609	17	0	0	30	656
2001	672	2	0	1	30	705
2002	493	0	0	1	30	524
2003	452	3	0	0	18	473
2004	462	2	0	0	14	478
2005	467	0	0	0	15	482
2006	380	0	0	0	13	393

Year	Denmark	Germany	Netherlands	Norway	Sweden	Total
2007	419	3	1	0	22	445
2008	326	4	0	0	16	346
2009	238	2	0	0	33	273
2010	188	0	0	0	17	205
2011	129	0	0	0	16	145
2012	110	0	0	0	8	118
2013	162	0	0	0	11	173
2014	190	0	0	1	4	194
2015	74	0	0	0	3	77
2016	106	0	0	0	3	109
2017	153	0	0	1	5	159
2018	189	0	0	0	3	192
2019 *	156	0	2	0	3	161
2020 *	111	0	0	0	5	116

* Preliminary catch statistics.

Division 3.a: ICES estimates of landings and discards

Year	Landings	Discards
2002	526	969
2003	475	569
2004	480	26
2005	485	319
2006	391	216
2007	436	887
2008	341	200
2009	269	385
2010	201	408
2011	142	973
2012	117	251
2013	171	342
2014	193	707
2015	77	274
2016	106	84
2017	154	253
2018	193	295
2019	160	154
2020	115	122

Summary of the assessment

Table 8 Flounder in Subarea 4 and Division 3.a. Assessment summary. Weights are in tonnes. High and low for stock size indicator indicates 1 standard deviation.

Year	Stock size indicator (NS-IBTS Q1)			Landings *	Discards
	Index	High	Low		
1950				3467	
1951				2748	
1952				2656	
1953				3220	
1954				2536	
1955				2810	
1956				2999	
1957				2178	
1958				2322	
1959				1956	
1960				2026	
1961				1907	
1962				2268	

Year	Stock size indicator (NS-IBTS Q1)			Landings *	Discards
	Index	High	Low		
1963				1312	
1964				2093	
1965				2324	
1966				1853	
1967				1189	
1968				1325	
1969				988	
1970				963	
1971				1285	
1972				1548	
1973				2002	
1974				3790	
1975				2939	
1976				3079	
1977				2505	
1978				2211	
1979				2077	
1980				1698	
1981				2248	
1982				2689	
1983	1.13	1.28	0.98	3069	
1984	1.10	1.25	0.94	1030	
1985	0.78	0.87	0.68	793	
1986	1.06	1.17	0.94	814	
1987	1.70	1.88	1.52	754	
1988	1.49	1.68	1.30	1598	
1989	1.80	2.00	1.58	1951	
1990	1.33	1.51	1.15	881	
1991	1.76	1.99	1.54	1659	
1992	1.39	1.55	1.23	1276	
1993	1.29	1.46	1.12	2545	
1994	1.03	1.17	0.89	2063	
1995	0.90	1.02	0.78	2125	
1996	0.88	1.00	0.76	2005	
1997	0.98	1.10	0.86	1290	
1998	1.03	1.16	0.89	5560	
1999	0.76	0.87	0.65	3672	
2000	0.68	0.78	0.58	3165	
2001	0.60	0.68	0.52	3022	
2002	0.65	0.74	0.56	4217	2084
2003	0.73	0.84	0.62	3922	1370
2004	0.84	0.95	0.72	4601	637
2005	1.08	1.23	0.93	4214	1265
2006	0.98	1.12	0.84	4837	1026
2007	1.15	1.30	1.01	3908	2082
2008	1.25	1.40	1.10	3067	1376
2009	1.05	1.18	0.92	2804	1342
2010	0.93	1.04	0.82	3166	3087
2011	0.90	1.02	0.78	3041	1694
2012	0.93	1.05	0.81	2189	1205

Year	Stock size indicator (NS-IBTS Q1)			Landings *	Discards
	Index	High	Low		
2013	0.75	0.85	0.66	1750	1415
2014	0.78	0.89	0.67	1907	1127
2015	1.08	1.23	0.94	1762	1228
2016	0.85	0.97	0.72	1750	628
2017	0.86	0.98	0.74	1244	588
2018	0.62	0.71	0.52	1587	657
2019	0.66	0.75	0.56	1653	727
2020	0.59	0.68	0.50	1715	679
2021	0.66	0.75	0.57		

* Official landings statistics 1950–2001, ICES-estimated landings 2002–2020.

Sources and references

EU. 2018. Regulation (EU) 2018/973 of the European Parliament and of the council of 4 July 2018 establishing a multiannual plan for demersal stocks in the North Sea and the fisheries exploiting those stocks, specifying details of the implementation of the landing obligation in the North Sea and repealing Council Regulations (EC) No 676/2007 and (EC) No 1342/2008. Official Journal of the European Union, L 179: 1–13. <http://data.europa.eu/eli/reg/2018/973/oj>.

ICES. 2017a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 26 April–5 May 2017, ICES Headquarters, Copenhagen, Denmark. ICES CM 2017/ACOM:21. 1077 pp. <https://doi.org/10.17895/ices.pub.5323>.

ICES. 2017b. EU request on a combined dab and flounder TAC and potential management measures besides catch limits. In Report of the ICES Advisory Committee, 2017. ICES Advice 2017, sr.2017.04. <https://doi.org/10.17895/ices.advice.5290>.

ICES 2018. Report of the Benchmark Workshop on North Sea Stocks (WKNSEA 2018), 6–10 November 2017 and 5–9 February 2018, ICES HQ, Copenhagen, Denmark. ICES CM 2018/ACOM:33. 632 pp. <https://doi.org/10.17895/ices.pub.5326>

ICES. 2021a. Advice on fishing opportunities. In Report of the ICES Advisory Committee, 2021. ICES Advice 2021, section 1.1.1. <https://doi.org/10.17895/ices.advice.7720>.

ICES. 2021b. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Scientific Reports. 3:66. <https://doi.org/10.17895/ices.pub.8211>. In prep.

STECF. 2016. Fisheries dependent information. Scientific, Technical and Economic Committee for Fisheries (STECF-16-20). Publications Office of the European Union, Luxembourg. EUR 27758 EN. <https://doi.org/10.2788/502445>.

[Download the stock assessment data and figures.](#)

Recommended citation: ICES. 2021. Flounder (*Platichthys flesus*) in Subarea 4 and Division 3.a (North Sea, Skagerrak and Kattegat). In Report of the ICES Advisory Committee, 2021. ICES Advice 2021, fle.27.3a4. <https://doi.org/10.17895/ices.advice.7753>