

Plaice (*Pleuronectes platessa*) in Division 7.d (eastern English Channel)

ICES advice on fishing opportunities

ICES advises that when the EU multiannual plan (MAP) for the Western Waters is applied, catches from the Division 7.d plaice stock in 2021 that correspond to the F ranges are between 6066 tonnes and 11 130 tonnes. According to the MAP, catches higher than those corresponding to F_{MSY} (8402 tonnes) can only be taken under conditions specified in the MAP, whilst the entire range is considered precautionary when applying the ICES advice rule.

Management should be implemented at the stock level.

Note: This advice sheet is abbreviated due to the COVID-19 disruption. The previous advice issued for 2020 is attached as Annex 1.

Stock development over time

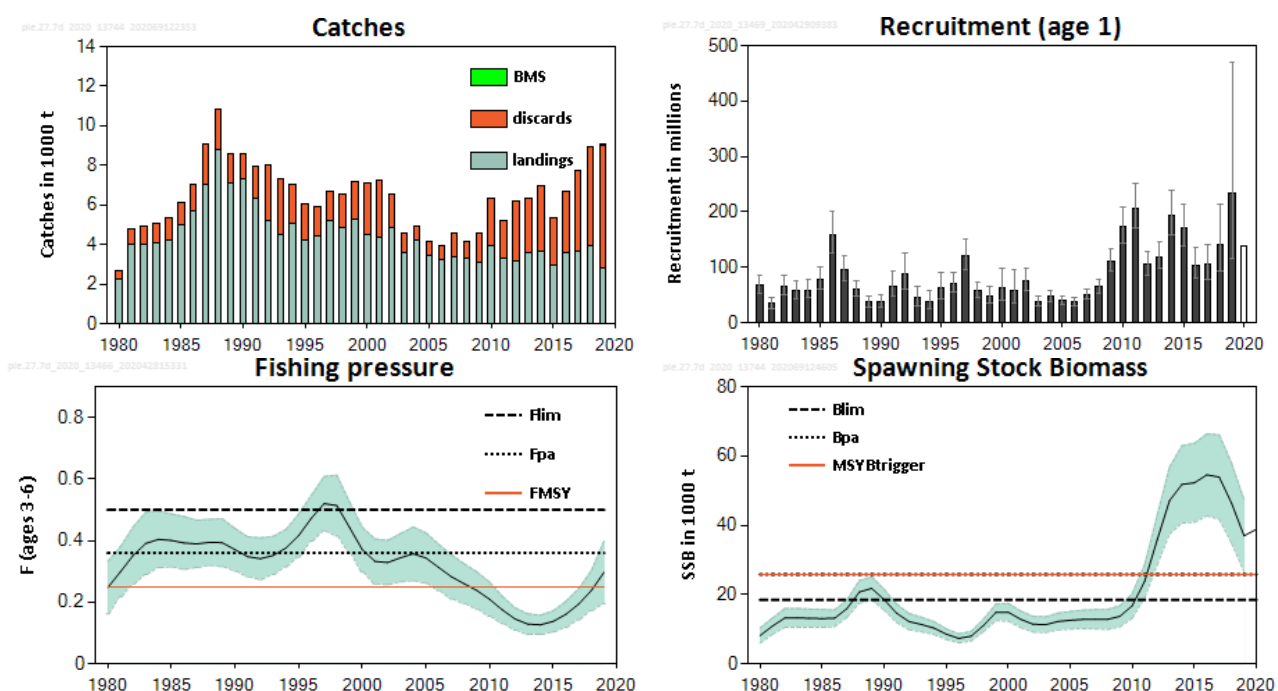


Figure 1 Plaice in Division 7.d. Summary of the stock assessment. Predicted values of recruitment are not shaded. Shaded areas (F, SSB) and error bars (R) indicate ± 2 standard errors (approximately 95% confidence intervals). The assumed recruitment is unshaded. Discard data are only available from 2006; values prior to that are model estimates. Landings below minimum conservation reference size (BMS) are those officially reported in logbooks.

Stock and exploitation status

Table 1 Plaice in Division 7.d. State of the stock and the fishery relative to reference points.

		Fishing pressure				Stock size			
		2017	2018	2019		2018	2019	2020	
Maximum sustainable yield	F_{MSY}	✓	✓	✗ Above		MSY	✓	✓	✓ Above trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓ Harvested sustainably		B_{pa}, B_{lim}	✓	✓	✓ Full reproductive capacity
Management plan	F_{MGT}	✓	✓	✓ Within range		B_{MGT}	✓	✓	✓ Above trigger

Catch scenarios

Table 2 Plaice in Division 7.d. Assumptions made for the interim year and in the forecast for Division 7.d plaice stock only. All weights are in tonnes; recruitment is in thousands.

Variable	Value	Notes
$F_{ages\ 3-6}$ (2020)	0.30	Average exploitation pattern (2017–2019), scaled to $F_{ages\ 3-6}$ in 2019
SSB (2021)	38191	Short-term forecast (STF)
$R_{age\ 1}$ (2019)	138285	Geometric mean 2014–2017. The model estimate has been replaced due to large uncertainty
$R_{age\ 1}$ (2020–2021)	138285	Geometric mean 2014–2017
Catch (2020)	11658	STF
Landings (2020)	4129	STF; projection based on the average landing ratio (2017–2019) by age
Discards (2020)	5707	STF; projection based on the average discard ratio (2017–2019) by age

Table 3 Plaice in Division 7.d. Annual catch scenarios. All weights are in tonnes.

Basis	Division 7.d plaice stock										Plaice in Division 7.d #				
	Total catch (2021) [^]	Projected landings * (2021)	Projected discards ** (2021)	F _{total} (ages 3–6) (2021)	F _{projected} landings (ages 3–6) (2021)	F _{projected} discards (ages 3–6) (2021)	SSB (2022)	% SSB change ***	% change in projected catches ****	% advice change [§]	Total catch (2021)	Projected landings* (2021)	Projected discards** (2021)	% change in projected catches ^^	% advice change ###
ICES advice basis															
EU MAP ^{^^^} : F _{MSY}	8402	3424	4978	0.25	0.088	0.162	39205	2.7	–7.1	–7.4	9959	4059	5900	–7.7	–6.8
F = MAP F _{MSY lower}	6066	2470	3596	0.175	0.062	0.113	41913	9.7	–33	–7.3 ^{§§}	7190	2928	4263	–33	–6.7
F = MAP F _{MSY upper}	11130	4540	6589	0.344	0.121	0.223	36088	–5.5	23	–7.5 ^{§§}	13192	5382	7811	22	–6.9
Other scenarios															
MSY approach: F _{MSY}	8402	3424	4978	0.25	0.088	0.162	39205	2.7	–7.1	–7.4	9959	4059	5900	–7.7	–6.8
F = 0	0	0	0	0	0	0	49099	29	–100	–100	0	0	0	–100	–100
F _{pa}	11573	4722	6851	0.36	0.127	0.233	35586	–6.8	28	28	13718	5597	8121	27	28
F _{lim}	15216	6214	9002	0.50	0.177	0.323	31521	–17.5	68	68	18036	7366	10670	67	69
SSB (2022) = B _{lim}	27772	11341	16430	1.15	0.407	0.745	18447	–52	207	206	32918	13443	19475	205	208
SSB (2022) = B _{pa}	20495	8377	12118	0.736	0.260	0.476	25826	–32	127	126	24293	9930	14364	125	127
SSB (2022) = MSY B _{trigger}	20495	8377	12118	0.736	0.260	0.476	25826	–32	127	126	24293	9930	14364	125	127
F = F ₂₀₂₀	9803	3997	5806	0.297	0.105	0.192	37597	–1.55	8.4	8	11620	4738	6882	7.7	8.7

* Marketable landings.

** Including BMS landings, assuming recent discard rate.

*** SSB 2022 relative to SSB 2021.

**** Projected catches in 2021 relative to the ICES estimates of catches in 2019 (9047 tonnes) for the Division 7.d plaice stock.

§ Total catch in 2021 relative to the advice value 2020 (9073 tonnes) for Division 7.d plaice stock.

§§ Advice value this year relative to the advice value last year for the MAP F_{MSY lower} (6545 tonnes) and MAP F_{MSY upper} (12 029 tonnes).

^ Differences between total catch and the sum of projected landings and discards result from rounding.

^^ Projected catches in 2021 relative to the ICES estimates of catches in 2019 (10 785 tonnes) for plaice caught in Division 7.d.

^^^ EU multiannual plan (MAP) for the Western Waters (EU, 2020).

All plaice in Division 7.d, including plaice originating from the North Sea and the western English Channel, according to a ratio calculated over the years 2003–2019: 15.63% of the plaice landed in Division 7.d is assumed to originate from the North Sea and the western English Channel, and this is added to the predicted values for the Division 7.d plaice stock. The ratio is applied to total catch, projected landings, and projected discards.

Total catch in 2021 relative to the advice value 2020 (10 687 tonnes) for plaice caught in Division 7.d.

Advice value this year relative to the advice value last year for the MAP F_{MSY lower} (7710 tonnes) and MAP F_{MSY upper} (13 192 tonnes) for plaice caught in Division 7.d.

Quality of the assessment

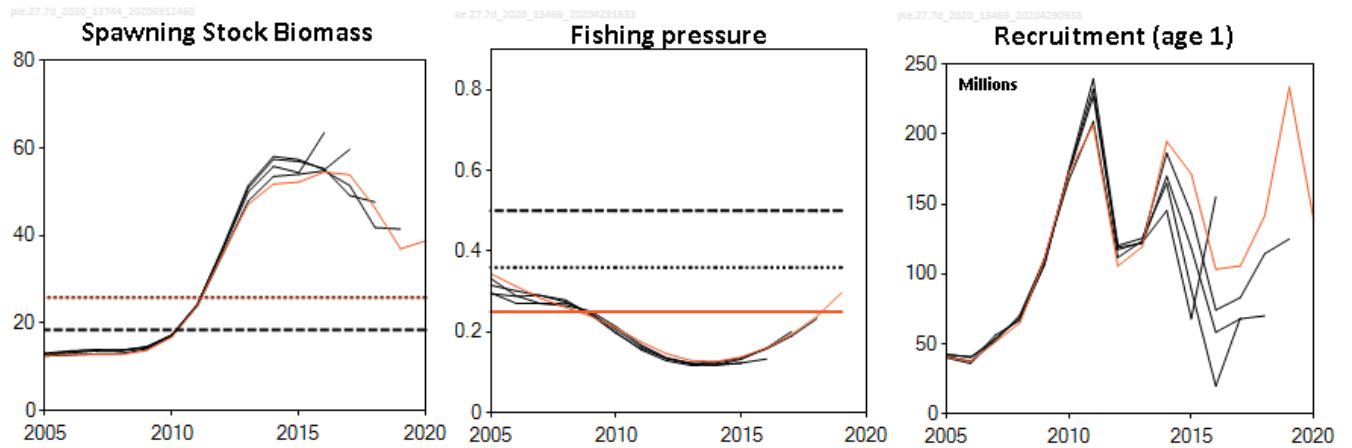


Figure 2 Plaiice in Division 7.d. Historical assessment results (final-year recruitment included for each line, corresponding to the forecast recruitment in the interim year).

History of the advice, catch, and management

Table 4 Plaice in Division 7.d. History of ICES advice, official landings for plaice in Division 7.d, agreed TAC for divisions 7.d and 7.e, and ICES estimates for landings and discards of Division 7.d plaice, and for plaice in Division 7.d. All weights are in tonnes.

Year	ICES advice	Landings corresponding to advice			Catch corresponding to advice		Agreed TAC 7.d, e	Official landings of plaice in 7.d *	ICES landings of plaice in 7.d *	ICES landings 7.d plaice	ICES discards of 7.d plaice	ICES discards of plaice in 7.d
		7.d plaice	Plaice in 7.d	Plaice in 7.d, e	7.d plaice stock	Plaice in 7.d						
1987	Precautionary TAC for 7.d,e			6800			8300	7867	8366	7006		
1988	Precautionary TAC for 7.d,e			6900			9960	9103	10420	8785		
1989	No increase in effort for 7.d,e			11700			11700	7115	8758	7093		
1990	No increase in F; TAC for 7.d,e			10700			10700	8367	9047	7349		
1991	TAC for 7.d,e			8800			10700	7913	7813	6362		
1992	Status quo F gives mean SSB		7600				9600	6232	6337	5219		
1993	Status quo F within safe biological limits		6400				8500	4771	5331	4479		
1994	No long-term gains in increased F		-				9100	5633	6121	5047		
1995	No increase in F		5600				8000	4569	5130	4196		
1996	No long-term gains in increasing F		6500				7530	4598	5393	4430		
1997	No advice		-				7090	5316	6307	5180		
1998	Reduce F in 1998 by 30% from 1996 value		4300				5700	4830	5762	4831		
1999	Fishing at F_{pa}		6300				7400	5437	6326	5268		
2000	Fishing at F_{pa}		4900				6500	5235	6014	4521		
2001	Fishing at $< F_{pa}$		< 4400				6000	4968	5266	4380		
2002	Fishing at $< F_{pa}$		< 5800				6700	5496	5777	4846		
2003	Fishing at $< F_{pa}$		< 5300				5970	4650	4086	3610		
2004	Fishing at $< F_{pa}^{**}$		< 5400				6060	4312	4750	4206		
2005	Fishing at $< F_{pa}^{**}$		< 4400				5150	3706	3991	3485		
2006	No effort increase **						5151	3525	3646	3225	727	749
2007	Average landings **		< 4000				5050	3845	4001	3381	1220	1252
2008	Average landings **		< 3500				5050	3609	3864	3278	888	936

Year	ICES advice	Landings corresponding to advice			Catch corresponding to advice		Agreed TAC 7.d, e	Official landings of plaice in 7.d *	ICES landings of plaice in 7.d *	ICES landings 7.d plaice	ICES discards of 7.d plaice	ICES discards of plaice in 7.d
		7.d plaice	Plaice in 7.d	Plaice in 7.d, e	7.d plaice stock	Plaice in 7.d						
2009	Average landings (2006–2008) **		< 3500				4646	3522	3560	3124	1473	1528
2010	Average landings (2007–2009)		< 3500				4274	3892	4411	3910	2412	2511
2011	Average landings (2008–2010)		< 3500				4665	3593	3649	3291	1926	2024
2012	No increase in catches and reduce discards		-				5062	3611	3723	3178	3043	3336
2013	Transition to F_{MSY} proxy for data- limited stocks by 2015 and reduce discards		< 4300				6400	4182	4127	3604	2696	2955
2014	Transition to F_{MSY} proxy for data- limited stocks by 2015 and reduce discards	< 3016	< 3925				5322	4326	4320	3675	3325	3886
2015	ICES DLS approach (F_{MSY} proxy)	< 2811	< 3469				6223	3749	3727	2957	2368	2821
2016	MSY approach	≤ 10855	≤ 12512	≤ 16249	≤ 16923	≤ 19506	12446	4658	4638	3617	3090	3603
2017	MSY approach	≤ 7550	≤ 8764	≤ 11381	≤ 12805	≤ 14864	10022	4581	4613	3689	4075	5065
2018	MSY approach	≤ 7132	≤ 8335	≤ 10909	≤ 10592	≤ 12378	10360	4977	4999	3975	4959	6215
2019	MSY approach				≤ 7864	≤ 9225	10354	3681	3721	2836	6211^^	7064 ^^
2020	Management Plan^				9073 (range 6545–12029)	10687 (range 7710–14170)	9154					
2021	Management Plan^				8402 (range 6066–11130)	9959 (range 7190–13192)						

* Plaice in Division 7.d, taking into account fish caught in the first quarter in Division 7.d that come to spawn from Division 7.e and Subarea 4.

** Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries.

^ EU multiannual plan (MAP) for the Western Waters (EU, 2019).

^^ Including BMS landings.

Summary of the assessment

Table 5 Plaice in Division 7.d. Assessment summary. Recruitment in thousands. Weights are in tonnes.

Year	Recruitment (age 1)			Spawning-stock biomass			Landings	Discards*	Official BMS landings	Catch *	Fishing mortality		
	Age 1	High	Low	SSB	High	Low					ages 3–6	High	Low
1980	67073	86725	51922	8171	10365	5976	2223	427		2650	0.25	0.33	0.16
1981	34321	45362	25992	10892	13234	8550	4009	772		4781	0.30	0.38	0.22
1982	65423	85761	49945	13275	15982	10568	4040	878		4918	0.35	0.44	0.26
1983	57174	75261	43446	13288	15978	10598	4093	999		5092	0.39	0.49	0.29
1984	58725	77103	44761	13161	15814	10508	4249	1125		5374	0.40	0.50	0.31
1985	77898	100067	60621	13096	15685	10507	5000	1112		6112	0.40	0.49	0.32
1986	159417	201004	126364	13152	15545	10759	5673	1341		7014	0.39	0.48	0.31
1987	96029	121130	76068	15945	18462	13428	7006	2095		9101	0.39	0.47	0.31
1988	60346	76686	47502	20748	24014	17482	8785	2078		10863	0.39	0.47	0.32
1989	37479	48354	29077	21788	25135	18441	7093	1502		8595	0.39	0.47	0.32
1990	38599	51266	29063	18534	21533	15535	7349	1214		8563	0.37	0.44	0.30
1991	66789	92452	48221	14631	17291	11971	6362	1618		7980	0.35	0.41	0.28
1992	87305	126230	60364	12200	14537	9863	5219	2784		8003	0.34	0.41	0.27
1993	44266	65367	29978	11368	13455	9281	4479	2845		7324	0.35	0.41	0.29
1994	38471	58734	25216	10350	12202	8498	5047	2011		7058	0.38	0.44	0.32
1995	62648	89883	43640	8590	10127	7052	4196	1882		6078	0.42	0.49	0.35
1996	70617	91440	54533	7370	8671	6069	4430	1487		5917	0.47	0.55	0.40
1997	120978	151943	96253	7983	9364	6602	5180	1477		6657	0.52	0.61	0.43
1998	58129	73876	45700	11082	12875	9289	4831	1746		6577	0.51	0.61	0.42
1999	48209	64800	35844	14840	17235	12445	5268	1939		7207	0.44	0.53	0.36
2000	63224	96961	41190	14914	17454	12374	4521	2579		7100	0.37	0.44	0.30
2001	58069	95305	35354	12862	15242	10482	4380	2870		7250	0.33	0.41	0.26
2002	74706	97653	57115	11451	13718	9184	4846	1732		6578	0.33	0.40	0.26
2003	38267	47508	30802	11310	13573	9047	3610	988		4598	0.34	0.42	0.27
2004	47625	58364	38853	12221	14634	9808	4206	730		4936	0.36	0.44	0.27
2005	40564	49165	33492	12583	15120	10046	3485	665		4150	0.34	0.43	0.26
2006	37510	45343	31008	12832	15491	10173	3225	727		3952	0.31	0.39	0.24
2007	51190	61547	42550	12879	15665	10093	3381	1220		4601	0.28	0.35	0.21
2008	65061	79160	53464	12824	15696	9952	3278	888		4166	0.26	0.33	0.196
2009	110550	132555	92157	13727	16769	10685	3124	1473		4597	0.24	0.30	0.178
2010	172484	208192	142883	16792	20335	13249	3910	2412		6322	0.21	0.27	0.154
2011	206930	250643	170794	23941	28730	19152	3291	1926		5217	0.175	0.22	0.131
2012	105755	129118	86640	35749	42858	28640	3178	3043		6221	0.146	0.182	0.110
2013	119502	146219	97650	47129	56805	37453	3604	2696		6300	0.129	0.162	0.096
2014	194829	238241	159366	51788	62928	40648	3675	3325		7000	0.127	0.158	0.096
2015	171519	213028	137974	52246	63635	40857	2957	2368		5325	0.138	0.172	0.104
2016	103466	134740	79451	54534	66367	42701	3617	3090		6707	0.161	0.20	0.119
2017	105763	141274	79185	53908	66085	41731	3689	4075		7764	0.194	0.24	0.144
2018	141687	214589	93482	46309	57825	34793	3975	4959		8934	0.24	0.30	0.174
2019	233770 ****	470655	116090	36963	47351	26575	2836	6210***	1	9047	0.30	0.40	0.195
2020	138285**			38830									

* Since 2006, discard estimates are raised from observer programmes. Prior to 2006, discards are reconstructed by the model.

** Geometric mean 2014–2017.

*** Since 2019, discards correspond to the projected discard estimates minus BMS landings from EU fleets officially reported in logbooks.

**** The model estimate has been replaced by the geometric mean 2014–2017 in the forecast due to large uncertainty.

Sources and references

EU. 2019. Regulation (EU) 2019/472 of the European Parliament and of the Council of 19 March 2019 establishing a multiannual plan for stocks fished in the Western Waters and adjacent waters, and for fisheries exploiting those stocks, amending Regulations (EU) 2016/1139 and (EU) 2018/973, and repealing Council Regulations (EC) No 811/2004, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007 and (EC) No 1300/2008. Official Journal of the European Union, L 83: 1–17. <http://data.europa.eu/eli/reg/2019/472/oj>.

ICES. 2020. ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Scientific Reports. 2:61. <http://doi.org/10.17895/ices.pub.6092>

Recommended citation: ICES. 2020. Plaice (*Pleuronectes platessa*) in Division 7.d (eastern English Channel). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, ple.27.7d. <https://doi.org/10.17895/ices.advice.5873>.

Annex 1

ICES Advice on fishing opportunities, catch, and effort
Greater North Sea ecoregion
Published 28 June 2019

Plaice (*Pleuronectes platessa*) in Division 7.d (eastern English Channel)

ICES advice on fishing opportunities

ICES advises that when the EU multiannual plan (MAP) for the Western Waters is applied, catches from the Division 7.d plaice stock in 2020 that correspond to the F ranges are between 6545 tonnes and 12 029 tonnes. According to the MAP, catches higher than those corresponding to F_{MSY} (9073 tonnes) can only be taken under conditions specified in the MAP, whilst the entire range is considered precautionary when applying the ICES advice rule.

Stock development over time

The spawning-stock biomass (SSB) has increased rapidly from 2010 following a period of high recruitment between 2009 and 2015, and is now still well above the $MSY B_{trigger}$, despite a decline since 2016. Fishing mortality (F) has declined since the early 2000s, with an increase in the recent years to slightly below F_{MSY} . Recruitment (R) is currently around the average of the last 10 years of the time series.

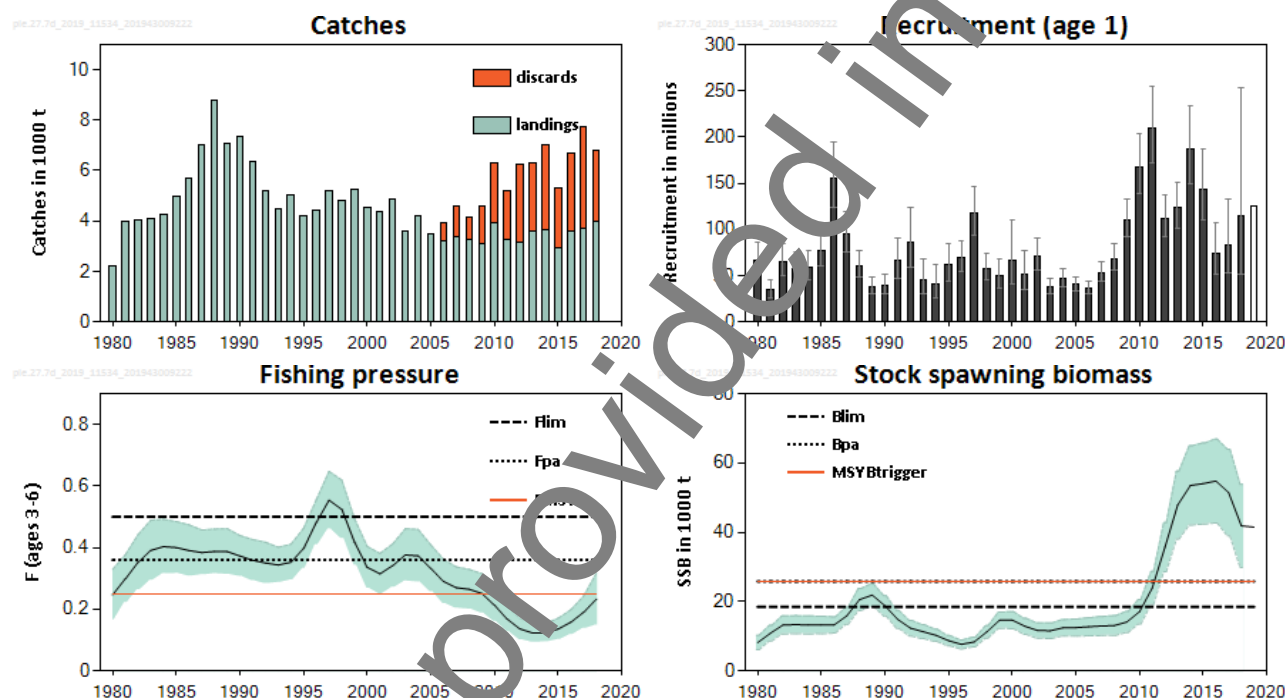


Figure 1 Plaice in Division 7.d. Summary of the stock assessment. Predicted values of recruitment are not shaded. Shaded areas (F , SSB) and error bars (R) indicate ± 2 standard errors (approximately 95% confidence intervals). The assumed recruitment is unshaded. Discards are only available from 2006.

Stock and exploitation status

ICES assesses that fishing pressure on the stock is below F_{MSY} , F_{pa} , and F_{lim} , and spawning stock size is above $MSY B_{trigger}$, B_{pa} , and B_{lim} .

Table 1 Plaice in Division 7.d. State of the stock and fishery relative to reference points.

		Fishing pressure			Stock size		
		2016	2017	2018	2017	2018	2019
Maximum sustainable yield	F_{MSY}	✓	✓	✓ Below	$MSY B_{trigger}$	✓	✓ Above trigger
Precautionary approach	F_{pa} , F_{lim}	✓	✓	✓ Harvested sustainably	B_{pa} , B_{lim}	✓	✓ Full reproductive capacity
Management plan	F_{MGT}	✓	✓	✓ Within range	MAP $MSY B_{trigger}$	✓	✓ Above trigger

ICES Advice 2019 – ple.27.7d – <https://doi.org/10.17895/ices.advice.4871>

ICES advice, as adopted by its Advisory Committee (ACOM), is developed upon request by ICES clients (European Union, NASCO, NEAFC, and Norway).

Catch scenarios

Table 2 Plaice in Division 7.d. Assumptions made for the interim year and in the forecast for Division 7.d plaice stock only.

Variable	Value	Notes
$F_{\text{ages 3-6}}$ (2019)	0.23	Average exploitation pattern (2016–2018), scaled to $F_{\text{ages 3-6}}$ in 2018
SSB (2020)	40 933	Short-term forecast (STF), in tonnes
R_{age1} (2019–2020)	125 134	Geometric mean 2013–2016, in thousands
Catch (2019)	8189	STF, in tonnes
Landings (2019)	4524	STF, in tonnes; projection based on the average landing ratio (2016–2018) by age
Discards (2019)	3665	STF, in tonnes; projection based on the average discard ratio (2016–2018) by age

Advice provided in 2019

Table 3 Plaice in Division 7.d. Annual catch scenarios. All weights are in tonnes (t).

Basis	Division 7.d plaice stock										Plaice in Division 7.d #					
	Total catch (2020) [^]	Wanted catch* (2020)	Unwanted catch* (2020)	F _{total} (ages 3–6) (2020)	F _{wanted} (ages 3–6) (2020)	F _{unwanted} (ages 3–6) (2020)	SSB (2021)	% SSB change **	% change in wanted catch ***	% advice change	Total catch (2020)	Wanted catch* (2020)	Unwanted catch* (2020)	% change in wanted catch ^^	% change in the 7.d portion of the TAC ##	% advice change ###
ICES advice basis																
EU MAP ^{^^^} : F _{MSY}	9073	4697	4376	0.25	0.115	0.135	41084	0.37	18.0	15.4	10687	5533	5155	10.6	36	15.9
F = MAP F _{MSY lower}	6545	3389	3156	0.175	0.081	0.094	43874	7.2	-14.8	-1.8	7710	3992	3718	-20	-1.92	-16.4
F = MAP F _{MSY upper}	12029	6225	5804	0.344	0.159	0.185	37864	-7.5	56	53	14170	7333	6837	47	80	54
Other scenarios																
MSY approach: F _{MSY}	9073	4697	4376	0.25	0.115	0.135	41084	0.37	18.0	15.4	10687	5533	5155	10.6	36	15.9
F = 0	0	0	0	0	0	0	51248	25	-100	-100	0	0	0	-100	-100	-100
F _{pa}	12510	6473	6037	0.36	0.166	0.194	37344	-8.8	63	59	14737	7625	7112	52	87	60
F _{lim}	16468	8514	7954	0.50	0.23	0.27	33127	-19.1	114	109	19399	10029	9370	100	147	110
SSB (2021) = B _{lim}	31231	16016	15215	1.22	0.56	0.66	18447	-55	300	300	36790	18867	17923	280	370	300
SSB (2021) = B _{pa}	23575	12156	11420	0.80	0.37	0.43	25826	-37	210	200	27771	14319	13452	186	250	200
SSB (2021) = MSY B _{trigger}	23575	12156	11420	0.80	0.37	0.43	25826	-37	210	200	27771	14319	13452	186	250	200
F = F ₂₀₁₉	8498	4400	4099	0.23	0.107	0.125	41715	-9.1	10.5	8.1	10011	5183	4828	3.6	27	8.5

* “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 discard rate estimates for 2016–2018.

** SSB 2021 relative to SSB 2020.

*** Wanted catch in 2020 relative to the ICES estimates of landings in 2018 (3980 t) for the Division 7.d plaice stock.

§ Total catch in 2020 relative to advice value 2019 (7864 t) for the Division 7.d plaice stock.

^ Differences between the total catch and the sum of wanted and unwanted catches result from rounding.

^^ Wanted catch in 2020 relative to the ICES estimates of landings in 2018 (5 004 t) for plaice caught in Division 7.d.

^^^ EU multiannual plan (MAP) for the Western Waters (EU, 2019).

All plaice in Division 7.d, including plaice originating from the North Sea and the western English Channel, according to a ratio calculated over the years 2003–2018: 15.1% of the plaice landed in Division 7.d is assumed to originate from the North Sea and the western English Channel, and this is added to the predicted values for the Division 7.d plaice stock. The ratio is applied to total catch, wanted catch, and unwanted catch.

Total catch in 2020 relative to the Division 7.d proportion of the TAC in 2019 (20 354 t), assuming the same proportion of the TAC is taken from Division 7.e as during 2003–2018.

Total catch in 2020 relative to advice value 2019 (9225 t) for plaice caught in Division 7.d.

The advice change (+15.4% for the Division 7.d plaice stock) is the result of applying the same F (F_{MSY}) to an estimated stock size that is expected to be higher due to higher recruitment.

Basis of the advice

Table 4 Plaice in Division 7.d. The basis of the advice.

Advice basis	EU multiannual management plan (MAP) plan for the Western Waters (EU, 2019)
Management plan	<p>The EU multiannual plan (MAP) for stocks in North Sea and adjacent waters applies to this stock. The plan specifies conditions for setting fishing opportunities depending on stock status and making use of the F_{MSY} range for the stock.</p> <p>In accordance with the MAP, catches higher than those corresponding to F_{MSY} can only be taken providing SSB is greater than $MSYB_{trigger}$, and one of the following conditions is met:</p> <ul style="list-style-type: none"> a) if it is necessary for the achievement of objectives of mixed fisheries; b) if it is necessary to avoid serious harm to a stock caused by intra- or inter-species stock dynamics; c) in order to limit variations in fishing opportunities between consecutive years to not more than 20 %. <p>ICES considers that the F_{MSY} range for this stock used in the MAP is precautionary.</p>

Quality of the assessment

There is uncertainty about the landing statistics of the Division 7.d plaice stock because of migrations between this area and the North Sea and the western English Channel during the spawning period. The current assessment results are dependent on the proportion of quarter 1 removals estimated from the historical tagging survey (ICES, 2010).

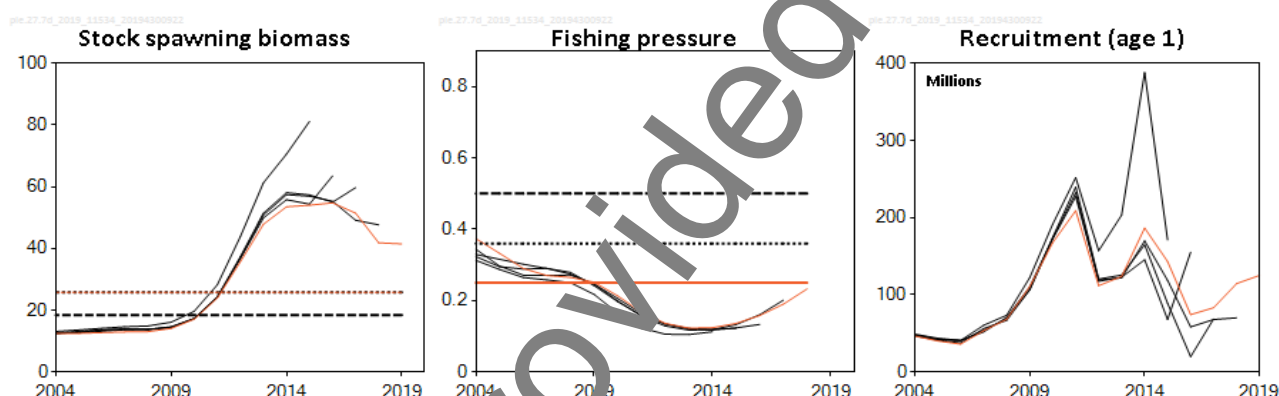


Figure 2 Plaice in Division 7.d. Historical assessment results.

Issues relevant for the advice

ICES provides advice based on the EU MAP for the Western Waters (EU, 2019).

A single TAC covers both division 7.d and 7.e; management should ensure that fishing opportunities are in line with the stock status for each of the stocks in the combined management area, to ensure that both stocks are exploited sustainably.

The European Commission (EC) has requested that ICES estimate catches for plaice in Division 7.d consistent with the advice. Assuming the same proportion of the Division 7.e and Subarea 4 plaice stocks is taken in Division 7.d as during 2003–2018, catches of plaice in Division 7.d in 2020 should be between 7710 tonnes and 14 170 tonnes.

Plaice is caught in a mixed fishery targeting sole, with 80 mm mesh size. This leads to a large number of plaice being discarded because this mesh size is not matched to the minimum conservation reference size (MCRS). This stock is under the EU landing obligation since 1 January 2019.

Reference points

Table 5 Plaice in Division 7.d. Reference points, values, and their technical basis. All weights are in tonnes.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	25 826	B_{pa}	ICES (2015a)
	F_{MSY}	0.25	EQsim analysis based on recruitment period 1981–2014	ICES (2015a)
Precautionary approach	B_{lim}	18 447	Break-point of hockey stick stock–recruit relationship, based on recruitment period 1981–2014	ICES (2015a)
	B_{pa}	25 826	$B_{lim} \times \exp(1.645 \times 0.2) \approx 1.4 \times B_{lim}$	ICES (2015a)
	F_{lim}	0.50	EQsim analysis based on recruitment period 1981–2014	ICES (2016)
	F_{pa}	0.36	$F_{lim} \times \exp(-1.645 \times 0.2) \approx F_{lim} / 1.4$	ICES (2016)
EU Management plan (MAP)*	MAP MSY $B_{trigger}$	25 826	MSY $B_{trigger}$	ICES (2015a)
	MAP B_{lim}	18 447	B_{lim}	ICES (2015a)
	MAP F_{MSY}	0.25	F_{MSY}	ICES (2015a)
	MAP range F_{lower}	0.175–0.25	Consistent with ranges provided by ICES (2015a), resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2015a)
	MAP range F_{upper}	0.25–0.344	Consistent with ranges provided by ICES (2015a), resulting in no more than 5% reduction in long-term yield compared with MSY	ICES (2015a)

* EU multiannual plan (MAP) for the Western Waters (EU, 2019).

Basis of the assessment

Table 6 Plaice in Division 7.d. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018).
Assessment type	Age-based analytical assessment (Aarts and Poos 2009) that uses catches in the model and in the forecast (ICES, 2019).
Input data	Commercial catch (international landings, with age frequencies from catch sampling covering 83% of the landings), two survey indices UK-BTS, FR-GRS. Constant natural mortality by age is calculated from Peterson and Wroblewski (1984). Fixed maturity ogive is based on biological sampling.
Discards and bycatch	Discards are included in the assessment and all major fleets are covered. In 2018, 77% of the landings had associated discard information, with age frequencies from catch sampling covering 79% of the discards. 73% of the discard estimates are based on observations. The model reconstructs discards for years where data are not available (before 2006).
Indicators	None.
Other information	Last benchmarked in 2015 (WKPLE; ICES, 2015b).
Working group	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)

Information from stakeholders

There is no additional available information.

History of the advice, catch, and management

Table 7 Plaice in Division 7.d. History of ICES advice, official landings for plaice in 7.d, agreed TAC for 7.d and 7.e, and ICES estimates for landings and discards of 7.d plaice, and for plaice in 7.d. All weights are in tonnes.

Year	ICES advice	Landings corresponding to advice			Catch corresponding to advice		Agreed TAC 7.d, e	Official landings of plaice in 7.d *	ICES landings of plaice in 7.d *	ICES landings 7.d plaice	ICES discards of 7.d plaice	ICES discards of plaice in 7.d
		7.d plaice	Plaice in 7.d	Plaice in 7.d, e	7.d plaice stock	Plaice in 7.d						
1987	Precautionary TAC for 7.d,e			6800			8300	7867	8366	7006		
1988	Precautionary TAC for 7.d,e			6900			9960	9103	10420	8785		
1989	No increase in effort for 7.d,e			11700			11700	7115	8758	7093		
1990	No increase in F; TAC for 7.d,e			10700			10700	8367	9047	7349		
1991	TAC for 7.d,e			8800			10700	7913	7813	6362		
1992	Status quo F gives mean SSB		7600				9600	6232	6337	5219		
1993	Status quo F within safe biological limits		6400				8500	4771	5331	4479		
1994	No long-term gains in increased F		-				9100	5633	6121	5047		
1995	No increase in F		5600				8000	4569	5130	4196		
1996	No long-term gains in increasing F		6500				7530	4598	5393	4430		
1997	No advice		-				7090	5316	6307	5180		
1998	Reduce F in 98 by 30% from 96 value		4300				5700	4830	5762	4831		
1999	Fishing at F_{pa}		6300				7400	5437	6326	5268		
2000	Fishing at F_{pa}		4900				6500	5235	6014	4521		
2001	Fishing at $< F_{pa}$		< 4400				6000	4968	5266	4380		
2002	Fishing at $< F_{pa}$		< 5800				6700	5496	5777	4846		
2003	Fishing at $< F_{pa}$		< 5300				5970	4650	4086	3610		
2004	Fishing at $< F_{pa}^{**}$		< 5400				6060	4312	4750	4206		
2005	Fishing at $< F_{pa}^{**}$		< 4400				5150	3706	3991	3485		
2006	No effort increase **						5151	3525	3646	3225	727	749
2007	Average landings **		< 4000				5050	3845	4001	3381	1220	1252
2008	Average landings **		< 3500				5050	3609	3864	3278	888	936

Year	ICES advice	Landings corresponding to advice			Catch corresponding to advice		Agreed TAC 7.d, e	Official landings of plaice in 7.d *	ICES landings of plaice in 7.d *	ICES landings 7.d plaice	ICES discards of 7.d plaice	ICES discards of plaice in 7.d
		7.d plaice	Plaice in 7.d	Plaice in 7.d, e	7.d plaice stock	Plaice in 7.d						
2009	Average landings (2006–2008) **		< 3500				4646	3521	3560	3124	1473	1528
2010	Average landings (2007–2009)		< 3500				4274	3891	4411	3910	2412	2511
2011	Average landings (2008–2010)		< 3500				4665	3593	3649	3291	1926	2024
2012	No increase in catches and reduce discards		-				5062	3611	3723	3178	3043	3336
2013	Transition to F_{MSY} proxy for data- limited stocks by 2015 and reduce discards		< 4300				6400	4182	4127	3604	2696	2955
2014	Transition to F_{MSY} proxy for data- limited stocks by 2015 and reduce discards	< 3016	< 3925				5322	4326	4320	3675	3325	3886
2015	ICES DLS approach (F_{MSY} proxy)	< 2811	< 3469				6223	3749	3727	2957	2368	2821
2016	MSY approach	≤ 10855	≤ 12512	≤ 16249	≤ 16922	≤ 19506	12446	4658	4638	3617	3090	3603
2017	MSY approach	≤ 7550	≤ 8764	≤ 11381	≤ 12005	≤ 14864	10022	4576	4613	3689	4075	5065
2018	MSY approach	≤ 7132	≤ 8335	≤ 10909	≤ 10592	≤ 12378	10360	4977	5004	3980	2846	3425
2019	MSY approach				≤ 7864	≤ 9225	10354					
2020	Management Plan				9173 (range 6545–12029)	10687 (range 7710–14170)						

* Plaice in Division 7.d, taking into account fish caught in the first quarter in Division 7.d that come from Division 7.e and Subarea 4 to spawn.

** Single-stock boundary and the exploitation of this stock should be conducted in the context of mixed fisheries.

*** Based on historical (2003–2018) proportion of landings in 7.e relative to 7.d,e

^ EU multiannual plan (MAP) for the Western Waters (EU, 2019).

History of the catch and landings

Table 8 Plaice in Division 7.d. Catch distribution of 7.d plaice by fleet in 2018 as estimated by ICES.

Table 6: Place in Division 7.a: Catch distribution of 7.a place by fleet in 2018 as estimated by ICES.					
Catch (2018)	Wanted catch				Unwanted catch
6 826 tonnes	41% beam trawl	39% otter trawl	5.4% trammel nets	14.6% other gears	2 836 tonnes
	3 980 tonnes				

Table 9 Plaice in Division 7.d. History of commercial catch and landings; both the official and ICES estimated values are presented by area for each country participating in the fishery. All weights are in tonnes.

Year	Belgium	France	UK(E+W)	Others	Official landings in 7.d	Unallocated in 7.d	ICES estimated landings of plaice in 7.d	Quarter 1 removals ^	ICES estimated landings for 7.d plaice ^	ICES estimated landings for plaice in 7.e	Agreed TAC for 7.d,e *
1976	147	1439	376		1962	1	1963		1963	640	
1977	149	1714	302		2165	81	2246		2246	702	
1978	161	1810	349		2320	156	2476		2476	784	
1979	217	2094	278		2589	28	2617		2617	977	
1980	435	2905	304		3644	-994	2650	427	2223	1178	
1981	815	3431	489		4735	34	4769	760	4009	1676	
1982	738	3504	541	22	4805	60	4865	825	4040	1878	
1983	1013	3119	548		4680	363	5043	950	4093	1714	
1984	947	2844	640		4431	730	5161	912	4249	1758	
1985	1148	3943	866		5957	65	6022	1022	5000	1677	
1986	1158	3288	828		5274	156	5430	1161	5673	2078	
1987	1807	4768	1292		7867	49	7916	1360	7006	2272	8300
1988	2165	5688	1250		9103	1317	10420	1635	8785	2835	9960
1989	2019	3713	1383		7115	164	8758	1665	7093	2742	11700
1990	2149	4739	1479		8367	68	9047	1698	7349	2985	10700
1991	2265	4082	1566		7913	-100	7813	1451	6362	2183	10700
1992	1560	3099	1572	1	6232	105	6337	1118	5219	1882	9600
1993	877	2792	1102		4771	560	5331	852	4479	1614	8500
1994	1418	3199	1007	9	5533	488	6121	1074	5047	1404	9100
1995	1157	2598	814		4569	561	5130	934	4196	1247	8000
1996	1112	2630	856		4598	795	5393	963	4430	1266	7530
1997	1161	3077	1078		5316	991	6307	1127	5180	1583	7090
1998	854	3276	700		4830	932	5762	931	4831	1346	5700
1999	1306	3388	743		5437	889	6326	1058	5268	1543	7400
2000	1298	3183	754		5235	779	6014	1494	4521	1625	6500
2001	1346	2962	660		4968	298	5266	886	4380	1310	6000
2002	1204	3450	711	1	5496	281	5777	931	4846	1472	6700
2003	998	2893	755	3	4650	-564	4086	476	3610	1387	5970
2004	954	2766	821	10	4312	438	4750	544	4206	1337	6060
2005	832	2432	621	21	3706	285	3991	506	3485	1319	5150
2006	1024	2935	650	16	3525	121	3646	421	3225	1411	5151
2007	1355	2017	463	10	3845	156	4001	620	3381	1146	5050
2008	1386	1710	471	12	3609	255	3864	586	3278	1112	5050
2009	1002	1891	612	16	3522	38	3560	436	3124	1024	4646
2010	1123	2190	517	62	3892	519	4411	501	3910	1208	4274
2011	1007	1994	472	60	3593	56	3649	358	3291	1417	4665
2012	1045	2962	542	63	3612	111	3723	544	3178	1492	5062
2013	1005	2159	641	87	4182	-55	4127	523	3604	1472	6400
2014	1389	2229	633	76	4327	-7	4320	645	3675	1490	5322

Year	Belgium	France	UK(E+W)	Others	Official landings in 7.d	Unallocated in 7.d	ICES estimated landings of plaice in 7.d	Quarter 1 removals ^	ICES estimated landings for 7.d plaice ^	ICES estimated landings for plaice in 7.e	Agreed TAC for 7.d,e *
2015	1600	1702	392	54	3748	-21	3727	770	2957	1441	6223
2016	2247	1557	795	60	4659	-21	4638	1020	3617	2113	12446
2017	2189	1487	814	86	4576	37	4613	924	3689	2129	10022
2018	1876	2171	832	98	4977	27	5004	1024	3980	1644	10360

* TACs for divisions 7.d and 7.e.

^ Takes into account the 'quarter 1 removal' of 65% of the quarter 1 Division 7.d catches of plaice that originate from Division 7.e and Subarea 4.

Summary of the assessment

Table 10 Plaice in Division 7.d. Assessment summary. Recruitment in thousands. Weights are in tonnes.

Year	Recruitment			SSB			Landings	Discards *	F		
	Age 1	High	Low	SSB	High	Low			Ages 3–6	High	Low
1980	66523	85502	51725	8173	10274	6072	2223		0.25	0.33	0.165
1981	34250	44970	26062	10864	13108	8620	4009		0.3	0.38	0.22
1982	65076	84691	49973	13263	15870	10656	4040		0.35	0.44	0.26
1983	57703	75691	43984	13333	15930	10736	4093		0.39	0.49	0.29
1984	59250	77545	45314	13265	15845	10685	4149		0.4	0.49	0.32
1985	77463	99064	60626	13236	15770	10702	5007		0.4	0.48	0.32
1986	154684	194530	122966	13245	15583	10907	5693		0.39	0.47	0.31
1987	94580	118900	75204	15871	18334	13108	7006		0.38	0.46	0.31
1988	60571	76582	47948	20561	23744	17178	8785		0.39	0.46	0.31
1989	38059	48916	29618	21861	25124	18596	7093		0.39	0.46	0.31
1990	39315	52108	29641	18774	21709	15199	7349		0.37	0.44	0.31
1991	65893	91243	47606	14872	17467	12277	6362		0.36	0.43	0.29
1992	85312	123197	59069	12324	14987	10051	5219		0.35	0.42	0.28
1993	45131	67547	30134	11309	13334	9284	4479		0.34	0.4	0.29
1994	40223	62540	25860	10271	12659	8483	5047		0.35	0.41	0.29
1995	61309	84445	44540	8724	10341	7237	4196		0.4	0.46	0.33
1996	68911	88015	54000	7661	8956	6371	4430		0.48	0.56	0.41
1997	117480	146946	93918	8447	9759	6936	5180		0.55	0.65	0.46
1998	57702	73665	45194	11157	13058	9476	4831		0.52	0.62	0.43
1999	49355	68058	35806	14613	16963	12263	5268		0.42	0.49	0.34
2000	66726	110521	40257	10650	17107	12193	4521		0.34	0.4	0.27
2001	51769	76992	34841	12861	15168	10554	4380		0.32	0.38	0.25
2002	70699	89804	55677	1650	13876	9424	4846		0.34	0.41	0.27
2003	38044	46964	30787	1579	13811	9347	3610		0.38	0.46	0.29
2004	46503	57098	37854	12424	14794	10054	4206		0.37	0.46	0.29
2005	40153	48577	32160	12492	14970	10014	3485		0.33	0.41	0.26
2006	35960	43264	29810	12729	15331	10127	3225	727	0.29	0.36	0.22
2007	53434	64220	44411	12959	15706	10212	3381	1220	0.27	0.34	0.2
2008	68264	84706	55325	13064	15919	10209	3278	888	0.26	0.33	0.2
2009	110669	137797	92173	14101	17127	11075	3124	1473	0.25	0.32	0.187
2010	167472	203200	138097	17083	20617	13549	3910	2412	0.21	0.27	0.16
2011	209111	251057	172315	23911	28692	19130	3291	1926	0.168	0.21	0.127
2012	111866	136730	91513	35669	42766	28572	3178	3043	0.136	0.171	0.101
2013	123701	151324	101197	47855	57660	38050	3604	2696	0.123	0.153	0.092
2014	186136	233300	149033	53506	64935	42077	3675	3325	0.124	0.154	0.094
2015	173106	187100	109382	54025	65718	42332	2957	2368	0.136	0.171	0.101
2016	174247	106628	51684	54787	66885	42689	3617	3090	0.158	0.198	0.118
2017	85105	132699	52165	51457	63971	38943	3689	4075	0.19	0.24	0.137
2018	15548	253860	51713	41845	53834	29856	3980	2846	0.23	0.32	0.148
2019	25134 **			41483							

* Raised discards estimates from observer program. The model reconstructs discards for years where data are not available (before 2006) but the estimates are not shown here.

** Geometric mean 2013–2016.

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Recommended citation: ICES. 2019. Plaice (*Pleuronectes platessa*) in Division 7.d (eastern English Channel). In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, ple.27.7d, <https://doi.org/10.17895/ices.advice.4871>