

Sole (*Solea solea*) in divisions 7.f and 7.g (Bristol Channel, Celtic Sea)

ICES advice on fishing opportunities

ICES advises that when the MSY approach is applied, catches in 2024 should be no more than 1267 tonnes.

ICES notes the existence of a precautionary management plan, developed and adopted by one of the relevant management authorities for this stock.

ICES advice on conservation aspects

ICES has not identified any conservation aspects.

Stock development over time

Fishing pressure on the stock is below F_{MSY} ; spawning-stock size is above MSY $B_{trigger}$, B_{pa} , and B_{lim} .

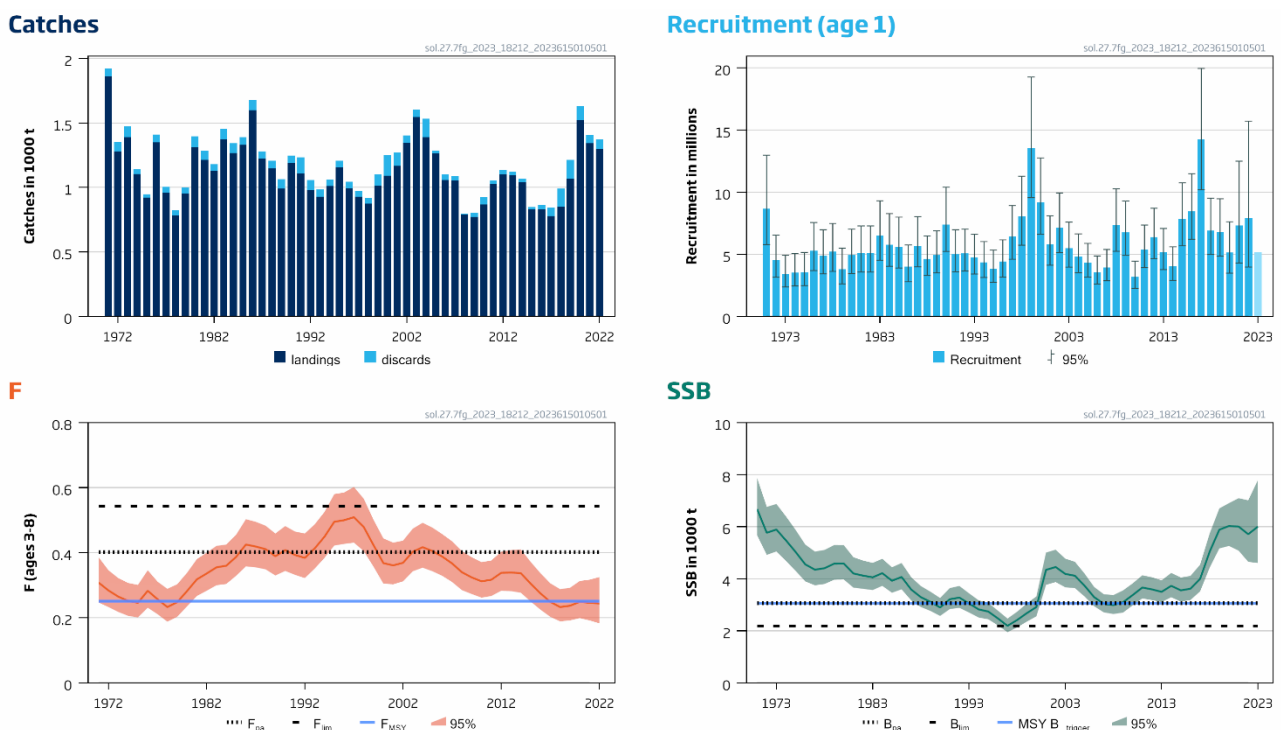


Figure 1 Sole in divisions 7.f and 7.g. Summary of the stock assessment. The assumed recruitment value for 2023 is shaded in a lighter colour.

Conservation status

ICES is not aware of any information on stock/species-specific conservation status.

Catch scenarios

Table 1 Sole in divisions 7.f and 7.g. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
$F_{\text{ages 3-8}}$ (2023)	0.264	Based on a catch of 1338 tonnes for 2023. Selection pattern from 2020 to 2022.
SSB(2024)	5850	Short-term forecast; in tonnes
$R_{\text{age 1}}$ (2023)	5156	Median recruitment, resampled from the years 1971–2020; in thousands *
$R_{\text{age 1}}$ (2024)	5140	Median recruitment, resampled from the years 1971–2020; in thousands*
Catch (2023)	1338	TAC for 2023; in tonnes
Projected landings (2023)	1263	Assuming average landings ratio by age 2020–2022; in tonnes
Projected discards (2023)	75	Assuming average discard ratio by age 2020–2022; in tonnes

* Random resampling of historical recruitment estimates leads to different values.

Table 2 Sole in divisions 7.f and 7.g. Annual catch scenarios. Weights are in tonnes.

Basis	Total catch (2024)	Projected landings* (2024)	Projected discards** (2024)	F_{total} (2024)	$F_{\text{projected landings}}$ (2024)	$F_{\text{projected discards}}$ (2024)	SSB (2025)	% SSB change ***	% TAC change ^	% advice change^^
ICES advice basis										
MSY approach: $F = F_{\text{MSY}}$	1267	1198	69	0.251	0.24	0.0160	5659	-3.3	-5.3	-5.3
Other scenarios										
EU MAP^^^: F_{MSY}	1267	1198	69	0.251	0.24	0.0160	5659	-3.3	-5.3	-5.3
EU MAP^^^: $F_{\text{MSY lower}}$	724	685	39	0.136	0.127	0.009	6226	6.4	-46	-46
EU MAP^^^: $F_{\text{MSY upper}}$	2121	1999	122	0.462	0.431	0.031	4762	-18.6	59	59
$F = 0$	0	0	0	0	0	0	6982	19.4	-100	-100
$F = F_{\text{pa}}$	1895	1787	108	0.402	0.375	0.027	5002	-14.5	42	42
$F = F_{\text{lim}}$	2405	2266	139	0.543	0.507	0.036	4466	-24	80	80
$\text{SSB}_{2025} = B_{\text{lim}}$	4625	4326	299	1.55	1.444	0.103	2184	-63	250	250
$\text{SSB}_{2025} = B_{\text{pa}} = \text{MSY } B_{\text{trigger}}$	3765	3533	232	1.05	0.978	0.069	3057	-48	181	181
$F = F_{2023}$	1324	1251	73	0.26	0.246	0.0180	5600	-4.3	-1.05	-1.05
$\text{SSB}_{2025} = \text{SSB}_{2024}$	1082	1023	59	0.21	0.197	0.0140	5850	0	-19.1	-19.1

* Marketable landings, assuming recent discard rate.

** Including BMS landings (EU stocks), assuming recent discard rate.

*** SSB 2025 relative to SSB 2024.

^ Total catch in 2024 relative to TAC 2023 (1338 tonnes).

^^ Advice value for 2024 relative to the advice value for 2023 (1338 tonnes).

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

The slight decrease in advice is due to a projected decrease and downward revision in biomass.

Basis of the advice

Table 3 Sole in divisions 7.f and 7.g. The basis of the advice.

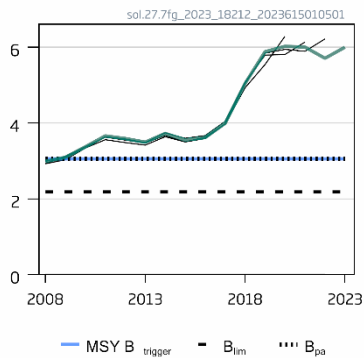
Advice basis	MSY approach
Management plan	ICES is aware of the multiannual management plan (MAP) that has been adopted by the EU for this stock (EU, 2019) and that ICES considers to be precautionary. There is no agreed shared management plan with UK for this stock, and ICES provides advice according to ICES MSY approach. Catch scenarios consistent with the MAP F_{MSY} ranges are provided.

Quality of the assessment

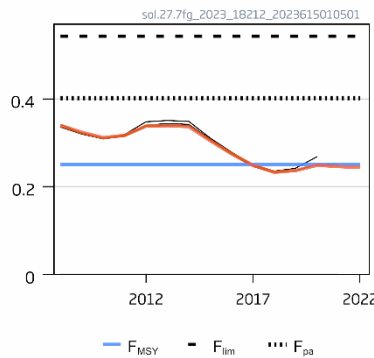
Information on the Belgian commercial beam trawl (BE-CBT) biomass tuning series was missing in the terminal year, which increases the uncertainty in the assessment.

Discard estimates are based on incomplete sampling of the fisheries in recent years. However, the main fleet is considered to be represented; therefore, this is considered to have minimal impact on the assessment.

SSB (1000 t)



Fbar(ages 3-8)



Rec (age 1; Millions)

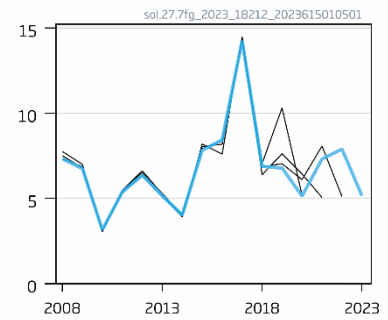


Figure 2 Sole in divisions 7.f and 7.g. Historical assessment results (final-year SSB estimate and recruitment assumption included for each line). The assessment was benchmarked in 2020 (ICES, 2020a); therefore, only the last four assessment years are shown.

Issues relevant for the advice

There is no information to present for this stock.

Reference points

Table 4 Sole in divisions 7.f and 7.g. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	3057	B_{pa} ; in tonnes.	ICES (2020b)
	F_{MSY}	0.251	Eqsim analysis based on the recruitment period 1971–2018	ICES (2020b)
Precautionary approach	B_{lim}	2184	B_{loss} estimated in 2020, corresponding to SSB in 1997; in tonnes	ICES (2020b)
	B_{pa}	3057	$B_{lim} \times 1.4$; in tonnes	ICES (2020b)
	F_{lim}	0.543	Eqsim analysis, based on the recruitment period 1971–2018	ICES (2020b)
	F_{pa}	0.402	F_{POS} ; F that leads to $SSB \geq B_{lim}$ with 95% probability	ICES (2020b)
Management plan*	MAP MSY $B_{trigger}$	3057	MSY $B_{trigger}$; in tonnes	EU (2019), ICES (2020b)
	MAP B_{pa}	3057	B_{pa} ; in tonnes	EU (2019), ICES (2020b)
	MAP B_{lim}	2184	B_{lim} ; in tonnes	EU (2019), ICES (2020b)
	MAP F_{MSY}	0.251	F_{MSY}	EU (2019), ICES (2020b)
	MAP range F_{lower}	0.136–0.251	Consistent with ranges provided by ICES (2020b), resulting in no more than 5% reduction in long-term yield compared with MSY	EU (2019), ICES (2020b)
	MAP range F_{upper}	0.251–0.462	Consistent with ranges provided by ICES (2020b), resulting in no more than 5% reduction in long-term yield compared with MSY	EU (2019), ICES (2020b)

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

Basis of the assessment

Table 5 Sole in divisions 7.f and 7.g. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2023a)
Assessment type	Age-based analytical assessment (SAM; Nielsen and Berg, 2014; ICES, 2023b) that uses landings and discards in the model and in the forecast
Input data	Total international landings, ages and length frequencies from catch sampling by métier; one survey index (UK[E&W]-BTS-Q3 [B6596], 1988–2022); five commercial biomass indices (BE-CBT [1971–1983 and 1984–1996]), BE-CBT3 [2006–2021], and UK[E & W]-CBT [1984–2005 and 2006–2022]); maturity data (ICES, 2020a); natural mortality is assumed to be constant. Catch numbers for ages 1 and 2 prior to 2004 are not used in the assessment model.
Discards and bycatch	Discard numbers available from 2004 onwards. Discards prior to 2004 are calculated using a constant ratio of discards to landings by age based on data from 2004–2018 (ICES, 2020a).
Indicators	None
Other information	Last benchmark in 2020 (ICES, 2020a)
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

History of the advice, catch, and management

Table 6 Sole in divisions 7.f and 7.g. History of ICES advice, agreed TAC, official landings, and ICES estimates for landings and discards. Weights are in tonnes.

Year	ICES advice	Catches corresponding to advice	Landings corresponding to advice	Agreed TAC	Official landings	ICES landings	ICES discards
1987	<i>Status quo</i> F; TAC		1600	1600	1264	1222	
1988	F = F (pre-86); TAC		900	1100	1204	1146	
1989	F at F (81–85); TAC		1000	1000	992	992	
1990	No increase in F		1200	1200	1239	1189	
1991	No increase in F		1100	1200	1496	1107	
1992	No long-term gains in increasing F		1100	1200	1060	981	
1993	No long-term gains in increasing F		-	1100	1030	928	
1994	No long-term gains in increasing F		-	1100	1018	1009	
1995	No increase in F		1000	1100	1165	1157	
1996	20% reduction in F		800	1000	1081	995	
1997	20% reduction in F		800	900	1038	927	
1998	20% reduction in F		700	850	1013	875	
1999	Reduce F below F_{pa}		810	960	947	1012	
2000	Reduce F below F_{pa}		< 1160	1160	1040	1091	
2001	Reduce F below F_{pa}		< 810	1020	1120	1168	
2002	Reduce F below F_{pa}		< 1000	1070	1118	1345	
2003	Reduce F below F_{pa}		< 1240	1240	1207	1547	
2004	Reduce F below F_{pa}		< 1000	1050	1130	1391	140
2005	Reduce F below F_{pa}		< 840	1000	997	1263	23
2006	Reduce F below F_{pa}		< 880	950	921	1058	41
2007	Reduce F below F_{pa}		< 840	893	943	1052	36
2008	Keep F below F_{pa}		< 1000	964	781	790	8
2009	No long-term gains in increasing F		< 940	993	806	772	30
2010	No long-term gains in increasing F		< 920	993	871	867	56
2011	See scenarios		-	1241	1027	1027	28
2012	MSY approach		< 1060	1060	1099	1101	32
2013	MSY approach		< 1100	1100	1085	1093	26
2014	MSY approach		< 920	1001	1042	1041	27
2015	MSY approach		< 652	851	830	831	17
2016	MSY approach	≤ 760	≤ 745	779	830	832	31
2017	MSY approach	≤ 806		845	777	778	65
2018	MSY approach	≤ 931		920	850	850	141
2019	MSY approach	≤ 864		1009	1068	1068	145
2020	Management plan	1686 (range 993–2597)		1652	1507	1524	106
2021	Management plan	1413 (range 811–2364)		1413	1364*	1343	62
2022	MSY approach	≤ 1337		1337	1299*	1300	72

Year	ICES advice	Catches corresponding to advice	Landings corresponding to advice	Agreed TAC	Official landings	ICES landings	ICES discards
2023	MSY approach	≤ 1338		1338			
2024	MSY approach	≤ 1267					

* Preliminary.

History of the catch and landings

Table 7 Sole in divisions 7.f and 7.g. Catch distribution by fleet in 2022, as estimated by ICES.

Total catch	Landings			Discards		
1372 tonnes	Beam trawlers 86%	Otter trawlers 14%	Other gears < 1%	Beam trawlers 86%	Otter trawlers 13%	Other gears < 1%
	1300 tonnes			72 tonnes		

Table 8 Sole in divisions 7.f and 7.g. History of official and ICES estimated landings (tonnes).

Year	Belgium	Denmark	France	Ireland	UK (E, W and N.I.)	UK (Scotland)	Other	Total official	ICES landings
1986	1039*	2	146	188	611	-	3	1989	1600
1987	701*	-	117	9	437	-	-	1264	1222
1988	705*	-	110	72	317	-	-	1204	1146
1989	684*	-	87	18	203	-	-	992	992
1990	716*	-	130	40	353	0	-	1239	1189
1991	982*	-	80	32	402	0	-	1496	1107
1992	543*	-	141	45	325	6	-	1060	981
1993	575*	-	108	51	285	11	-	1030	928
1994	619*	-	90	37	264	8	-	1018	1009
1995	763*	-	88	20	294	-	-	1165	1157
1996	695*	-	102	19	265	0	-	1081	995
1997	660*	-	99	28	251	0	-	1038	927
1998	675*	-	98	42	198	-	-	1013	875
1999	604	-	61	51	231	0	-	947	1012
2000	694	-	74	29	243	-	-	1040	1091
2001	720	-	77	35	288	-	-	1120	1168
2002	703	-	65	32	318	-	-	1118	1345
2003	715	-	124	26	342	-	-	1207	1547
2004	735	-	79	33	283	-	-	1130	1391
2005	645	-	101	34	217	-	-	997	1263
2006	576	-	75	38	232	-	-	921	1058
2007	582	-	85	32	245	-	-	943	1052
2008	466	-	68	28	218	-	-	781	790
2009	513	-	73	26	195	-	-	806	772
2010	620	-	44	27	180	-	-	871	867
2011	775	-	54	30	168	-	-	1027	1027
2012	843	-	48	33	175	-	-	1099	1101
2013	789	-	49	42	205	-	-	1085	1093
2014	703	-	58	28	252	-	-	1042	1041
2015	674	-	24	27	105	-	-	830	831
2016	563	-	72	21	174	-	-	830	832
2017	551	-	49	28	149	-	-	777	778
2018	607	-	44	27	171	-	-	850	850
2019	800	-	42	33	193	-	< 1	1068	1068
2020	1121	-	44	51	291	-	< 1	1507	1524
2021**	858	-	61	48	395	-	2	1364	1343
2022**	840	-	67	31	354	-	7	1299	1300

* Including divisions 7.g-k.

**Preliminary official landings.

Summary of the assessment

Table 9 Sole in divisions 7.f and 7.g. Assessment summary. Weights are in tonnes and recruitment in thousands. High and Low refer to approximate 95% confidence intervals.

Year	Recruitment age 1			SSB			Landings**	Discards***	Fishing mortality ages 3–8		
	Low	Value	High	Low	Value	High			Low	Value	High
1971	5764	8647	12972	5668	6676	7863	1861	62	0.25	0.31	0.39
1972	3146	4529	6522	4917	5765	6760	1278	74	0.23	0.28	0.35
1973	2368	3412	4917	5048	5890	6873	1391	81	0.22	0.27	0.32
1974	2445	3521	5071	4682	5470	6391	1105	36	0.21	0.25	0.31
1975	2466	3562	5144	4301	5026	5873	919	27	0.20	0.25	0.30
1976	3681	5271	7550	3898	4551	5313	1350	58	0.23	0.28	0.35
1977	3415	4879	6971	3748	4348	5044	961	41	0.21	0.26	0.31
1978	3615	5197	7470	3799	4405	5107	780	45	0.188	0.23	0.29
1979	2611	3786	5491	3961	4579	5295	954	45	0.20	0.25	0.30
1980	3445	4918	7021	3969	4582	5290	1314	81	0.24	0.28	0.34
1981	3570	5095	7273	3658	4202	4826	1212	70	0.27	0.32	0.38
1982	3562	5090	7275	3612	4119	4698	1128	52	0.28	0.34	0.40
1983	4520	6480	9291	3566	4054	4608	1373	81	0.30	0.36	0.42
1984	4021	5767	8271	3726	4214	4767	1266	77	0.30	0.36	0.43
1985	3886	5571	7987	3462	3921	4440	1328	60	0.33	0.39	0.46
1986	2787	4003	5749	3594	4068	4606	1600	80	0.36	0.43	0.50
1987	3992	5661	8027	3166	3585	4060	1222	56	0.36	0.42	0.50
1988	3292	4621	6487	2914	3293	3720	1146	61	0.35	0.41	0.48
1989	3503	4913	6889	2764	3111	3502	992	70	0.33	0.39	0.46
1990	5224	7368	10393	2571	2895	3260	1189	57	0.34	0.41	0.48
1991	3589	5003	6975	2833	3211	3640	1107	126	0.33	0.39	0.47
1992	3651	5063	7022	2883	3276	3723	981	77	0.32	0.38	0.46
1993	3406	4738	6591	2703	3050	3441	928	56	0.35	0.41	0.49
1994	3128	4340	6021	2511	2823	3173	1009	52	0.38	0.45	0.53
1995	2732	3819	5339	2443	2740	3073	1157	50	0.42	0.50	0.58
1996	3153	4407	6159	2209	2476	2776	995	47	0.43	0.50	0.59
1997	4597	6405	8922	1946	2192	2470	927	46	0.43	0.51	0.60
1998	5721	8032	11276	2132	2414	2734	875	43	0.41	0.48	0.57
1999	9553	13566	19264	2351	2677	3047	1012	89	0.36	0.42	0.50
2000	6598	9171	12748	2556	2914	3322	1091	158	0.31	0.37	0.44
2001	4122	5775	8090	3765	4341	5006	1168	101	0.30	0.36	0.43
2002	5137	7146	9940	3872	4450	5116	1345	58	0.31	0.37	0.44
2003	3960	5482	7589	3670	4185	4771	1547	54	0.34	0.40	0.47
2004	3513	4829	6638	3640	4115	4652	1391	140	0.35	0.42	0.49
2005	3148	4300	5875	3319	3734	4201	1263	23	0.34	0.41	0.48
2006	2592	3553	4870	2942	3292	3684	1058	41	0.33	0.39	0.46
2007	2862	3923	5379	2708	3037	3405	1052	36	0.31	0.37	0.44
2008	5231	7329	10269	2645	2986	3372	790	8	0.28	0.34	0.41
2009	4905	6747	9282	2700	3097	3552	772	30	0.27	0.32	0.39
2010	2250	3162	4444	2977	3373	3822	867	56	0.26	0.31	0.37
2011	3926	5371	7348	3244	3662	4133	1027	28	0.27	0.32	0.38
2012	4650	6361	8702	3180	3592	4057	1101	32	0.28	0.34	0.40
2013	3761	5156	7068	3106	3497	3937	1093	26	0.28	0.34	0.41
2014	2894	4025	5598	3289	3727	4223	1041	27	0.28	0.34	0.41
2015	5684	7818	10753	3122	3555	4047	831	17	0.25	0.31	0.37
2016	6208	8443	11483	3183	3617	4109	832	31	0.23	0.28	0.34
2017	10179	14251	19954	3513	3993	4539	778	65	0.20	0.25	0.31
2018	4980	6881	9507	4430	5045	5744	850	141	0.189	0.23	0.29
2019	4854	6780	9469	5165	5884	6703	1068	145	0.192	0.24	0.29
2020	3473	5140	7607	5260	6026	6905	1524	106	0.199	0.25	0.31
2021	4282	7311	12484	5080	6004	7095	1343	62	0.192	0.25	0.32

Year	Recruitment age 1			SSB			Landings**	Discards***	Fishing mortality ages 3–8		
	Low	Value	High	Low	Value	High			Low	Value	High
2022	3967	7894	15708	4649	5710	7013	1300	72	0.183	0.24	0.33
2023		5156*		4604	6002	7789					

* Median resampled recruitment (1971–2020) as estimated by a stochastic projection.

** Landings are ICES estimates.

*** ICES discard estimates only available from 2004 to 2022. Discards prior to 2004 are calculated using a discard rate-at-age based on 2004–2018 discard data.

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

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