

Sole (*Solea solea*) in divisions 7.h–k (Celtic Sea South, southwest of Ireland)

ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches in 2020 should be no more than 213 tonnes.

Stock development over time

The assessment is indicative of trends only. The spawning-stock biomass (SSB) shows an increasing trend since the mid-2000s until 2015, but has now declined below $MSY B_{trigger}$. Fishing mortality has been around F_{MSY} over the last decade and is estimated to be currently below F_{MSY} . Recruitment has fluctuated without trend over the time series, but the 2018 recruitment was the lowest on record.

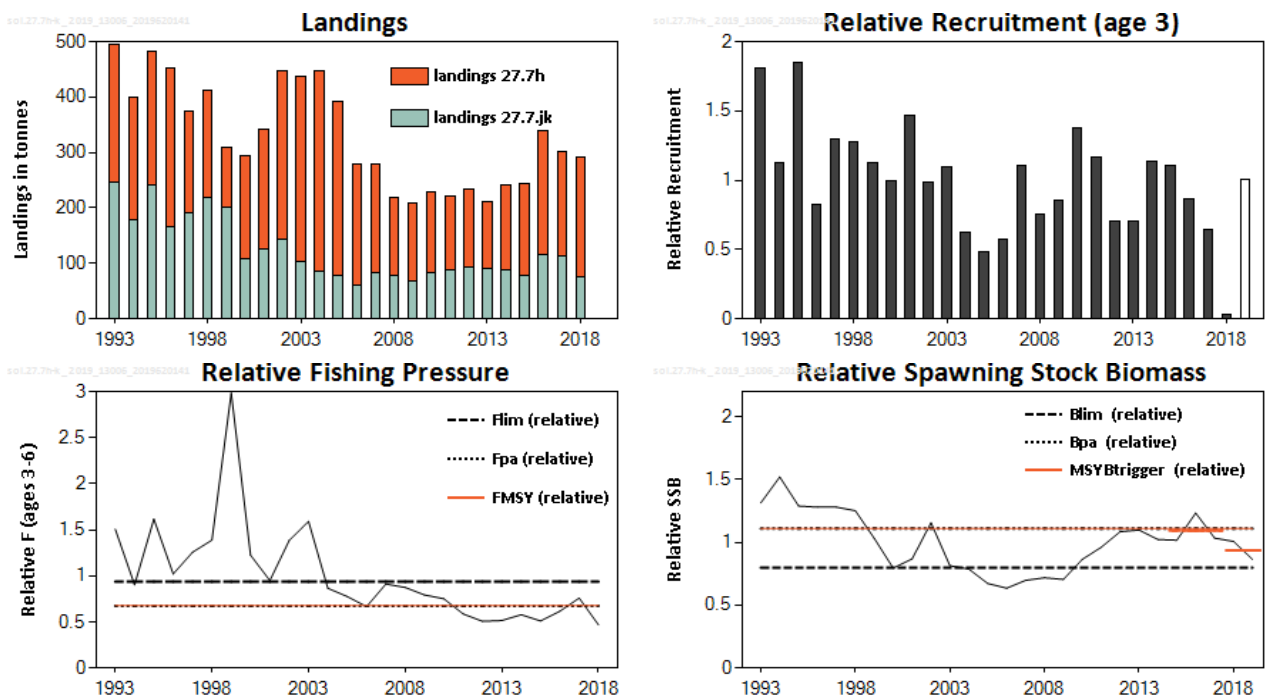


Figure 1 Sole in divisions 7.h–k. Summary of the stock assessment, based on divisions 7.j and 7.k. The landings are for the full stock area (divisions 7.h–k), but only landings from divisions 7.j and 7.k are used in the assessment. Recruitment, F, and SSB values are relative to the average of the time-series. The short orange lines in the relative SSB plot indicate the average values of the respective years (2015 to 2017, and 2018 to 2019).

Stock and exploitation status

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

Table 1 Sole in divisions 7.h–k. 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 proxy	$MSY B_{trigger}$	✗	✗ Below proxy
Precautionary approach	F_{pa}, F_{lim}	✓	○	✓ Harvested sustainably	B_{pa}, B_{lim}	○	○ Increased risk
Management plan	F_{MGT}	?	?	? Undefined	B_{MGT}	✗	✗ Below trigger

Catch scenarios

ICES framework for category 3 stocks was applied (ICES, 2018). The relative SSB estimated by the assessment model is used as the index of stock development. The advice is based on the ratio between the average of the two latest index values (index A) and the average of the three preceding values (index B), multiplied by the recent advised catch.

The index is estimated to have decreased less than 20% and, thus, the uncertainty cap was not applied. The stock size is below proxies of the MSY reference points and the precautionary buffer has never been applied; therefore it was applied. Discarding is assumed to be negligible.

Table 2 Sole in divisions 7.h–k. The basis for the catch scenarios*.

Index A (2018–2019)		0.94
Index B (2015–2017)		1.09
Index ratio (A/B)		0.86
Uncertainty cap	Not applied	-
Advised catch for 2019		311 tonnes
Discard rate		Negligible
Precautionary buffer	Applied	0.8
Catch advice **		213 tonnes
% Advice change ***		-32%

* 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.

** [(advice for 2019 × index ratio) × precautionary buffer]

*** Advice value for 2020 relative to advice value for 2019.

This year's advice has decreased by 32% when compared to last year's advice, because of the decrease in the biomass index, and the application of the precautionary buffer.

Basis of the advice

Table 3 Sole in divisions 7.h–k. The basis of the advice.

Advice basis	Precautionary approach
Management plan	The European Parliament and the Council have published a multiannual management plan (MAP) for the Western Waters (EU, 2019). This plan applies to demersal stocks including sole in ICES divisions 7.h–k.
	The MAP stipulates that when the F_{MSY} ranges are not available the precautionary approach should be applied.

Quality of the assessment

The advice is based on an assessment considered indicative of trends. The available landings-at-age data do not cover the Division 7.h component. The assessment is carried out on the landings from divisions 7.j and 7.k only, but is assumed to be representative of Division 7.h as well.

There is a lack of reliable information on younger fish and fishery-independent indices.

There is uncertainty in stock identity.

Issues relevant for the advice

The TAC is currently not restrictive, but for some countries the quota appears to have become restrictive.

Reference points

Table 4 Sole in divisions 7.h–k. Reference points, values, and their technical basis.

Framework	Reference point	Relative value*	Technical basis	Source
MSY approach	MSY $B_{\text{trigger proxy}}$	1.11	B_{pa}	ICES (2017, 2019)
	$F_{\text{MSY proxy}}$	0.66	Median point estimates of EqSim with a segmented regression S–R relationship	ICES (2017, 2019)
Precautionary approach	B_{lim}	0.80	Break point segmented regression S–R relationship	ICES (2017, 2019)
	B_{pa}	1.11	$B_{\text{lim}} \times \exp(1.645 \times \sigma)$; $\sigma = 0.20$	ICES (2017, 2019)
	F_{lim}	0.92	F with 50% probability of $\text{SSB} < B_{\text{lim}}$	ICES (2017, 2019)
Management plan**	MSY $B_{\text{trigger proxy}}$	1.11	MSY $B_{\text{trigger proxy}}$	ICES (2017, 2019)
	MAP $F_{\text{MSY proxy}}$	0.66	$F_{\text{MSY proxy}}$	ICES (2017, 2019)

* All values are relative to the average of the time-series in the stock assessment (see Table 9).

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

Basis of the assessment

Table 5 Sole in divisions 7.h–k. Basis of the assessment and advice.

ICES stock data category	3 (ICES, 2018).
Assessment type	Age-based analytical assessment (XSA) indicative of stock trends (ICES, 2019)
Input data	Commercial catches (international landings from divisions 7.j and 7.k, Irish age composition from catch sampling); commercial tuning index (IRL-VMS-OTB); natural mortalities and maturity are assumed to be the same as for sole in divisions 7.f and 7.g.
Discards and bycatch	Discards are considered negligible and are not included.
Indicators	None
Other information	
Working group report	Working Group for the Celtic Seas Ecoregion (WGCSE)

Information from stakeholders

There is no additional available information.

History of the advice, catch, and management

Table 6 Sole in divisions 7.h–k. History of ICES advice, agreed TAC, official landings, and ICES estimates for catch. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Agreed TAC	Official landings	ICES landings
1996	No advice	-	-	826	443
1997	No advice	-	-	742	564
1998	No advice	-	-	759	423
1999	No advice	-	-	406	381
2000	No advice	-	-	303	329
2001	No advice	-	650	352	325
2002	No advice	-	650	517	430
2003	Reduce TAC to recent landings	330	390	486	245
2004	Reduce TAC to recent average (2000–2002)	360	390	450	290
2005	Reduce TAC to recent average (2001–2003)	335	650	395	326
2006	Reduce TAC to recent average (2002–2004)	380	650	279	272
2007	Reduce TAC to recent average (2003–2005)	287	650	278	277
2008	Reduce TAC to recent average (2004–2006)	300	650	219	225
2009	Same advice as last year	300	553	208	208
2010	No advice	-	498	229	228
2011	No increase in catches	-	423	218	237
2012	No increase in catches	-	423	233	228

Year	ICES advice	Catch corresponding to advice	Agreed TAC	Official landings	ICES landings
2013	Decrease catches by 8% (15% increase, followed by 20% PA reduction)	< 200	402	212	211
2014	Increase catches by 11%	< 252	382	239	243
2015	Average catch (2011–2013)	< 225	382	237	248
2016	Precautionary approach (decrease recent advised value by no more than 9%)	≤ 205	382	329	339
2017	Precautionary approach (increase recent advised value by no more than 9%)	≤ 223	382	373	295
2018	Precautionary approach (increase recent advised value by no more than 20%)	≤ 268	382	282*	295
2019	Precautionary approach	≤ 311	382		
2020	Precautionary approach	≤ 213			

*Preliminary.

History of the catch and landings

Table 7 Sole in divisions 7.h–k. Catch distribution by fleet in 2018 as estimated by ICES.

Catch (2018)	Landings			Discards
	Otter trawl 54%	Beam trawl 43%	Other 3%	
296 tonnes	295 tonnes			1 tonne

Table 8 Sole in divisions 7.h–k. History of commercial landings by country. All weights are in tonnes.

Year	Divisions															
	7.h					7.j				7.k			7.h	7.j–k	7.h–k	7.h–k
	Bel.	Fra.	Ire.	NL	UK	Bel.	Fra.	Ire.	UK	Fra.	Ire.	UK	Total	Total	Total	ICES estim.
1993	0	43	0	0	206	0	1	237	8	0	0	0	249	246	495	
1994	0	42	8	0	172	0	0	176	2	0	0	0	222	178	400	
1995	0	44	11	0	186	0	1	232	6	2	0	0	241	241	482	
1996	0	48	20	70	147	0	2	162	1	0	1	0	285	166	451	443
1997	0	56	16	0	111	0	2	187	1	0	0	1	183	191	374	564
1998	0	65	13	7	109	0	8	208	2	1	0	0	194	219	413	423
1999	5	0	8	1	96	96	0	199	1	0	0	0	110	200	310	381
2000	0	72	8	10	95	8	4	103	0	2	0	0	185	109	294	329
2001	6	86	11	0	111	7	11	113	0	2	1	0	214	127	341	325
2002	85	85	9	0	124	69	8	120	0	15	1	0	303	144	447	430
2003	122	113	23	0	78	48	20	82	0	0	0	0	336	102	438	245
2004	155	95	33	0	79	2	7	78	0	0	0	0	362	85	447	290
2005	90	86	28	0	112	0	7	69	0	0	1	0	316	77	393	326
2006	36	81	14	1	86	0	11	49	1	0	0	0	218	61	279	272
2007	31	69	4	0	91	0	9	73	0	0	1	0	195	83	278	277
2008	10	49	3	0	80	0	8	69	0	0	0	0	142	77	219	225
2009	11	70	0	0	58	0	9	60	0	0	0	0	139	69	208	208
2010	20	73	3	0	51	0	14	68	0	0	0	0	147	82	229	228
2011	10	70	1	0	54	0	23	63	0	1	0	0	135	87	222	237
2012	18	74	2	0	46	0	11	83	0	0	0	0	140	94	234	228
2013	4	69	1	0	47	0	7	84	0	0	0	0	121	91	212	211
2014	42	56	3	0	53	0	5	78	0	0	0	0	154	83	237	243
2015	40	70	3	0	53	0	4	74	0	0	0	0	166	78	244	248
2016	91	67	4	0	61	0	10	94	2	0	0	0	223	115	329	339
2017	70	75	4	0	38	4	6	81	1	1	1	0	188	185	373	295
2018*	92	84	8	0	33	5	7	53	<1	<1	<1	0	217	66	282	295

* Preliminary.

Summary of the assessment

Table 9 Sole in divisions 7.h–k. Summary of the stock assessment; assessment results are for divisions 7.j and 7.k. Recruitment, SSB, and F are relative to the mean of the time-series. Landings are in tonnes.

Year	Relative recruitment age 3	SSB	Landings	F ages 3–6	Landings Division 7.h *	Landings divisions 7.j–k
1993	1.80	1.31	246	1.51	249	246
1994	1.12	1.52	178	0.90	222	178
1995	1.85	1.29	241	1.62	241	241
1996	0.83	1.28	166	1.02	285	166
1997	1.30	1.28	191	1.26	183	191
1998	1.27	1.25	219	1.39	194	219
1999	1.13	1.03	200	3.0	110	200
2000	1.00	0.80	109	1.22	185	109
2001	1.47	0.87	127	0.95	214	127
2002	0.98	1.16	144	1.38	303	144
2003	1.10	0.81	102	1.59	336	102
2004	0.62	0.79	85	0.86	362	85
2005	0.48	0.67	77	0.78	316	77
2006	0.58	0.64	61	0.67	218	61
2007	1.10	0.70	83	0.91	195	83
2008	0.76	0.72	77	0.87	142	77
2009	0.85	0.70	69	0.79	139	69
2010	1.38	0.86	82	0.75	147	82
2011	1.17	0.96	87	0.59	135	87
2012	0.70	1.08	94	0.51	140	94
2013	0.70	1.10	91	0.51	121	91
2014	1.14	1.02	87	0.58	154	87
2015	1.11	1.02	78	0.51	166	78
2016	0.87	1.23	115	0.62	224	115
2017	0.64	1.03	115	0.76	190	115
2018	0.033	1.01	75	0.47	220	75
2019	1.00	0.86				

*Landings in Division 7.h are not used in the assessment.

Sources and references

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