ICES Advice on fishing opportunities, catch, and effort
Celtic Seas and Oceanic Northeast Atlantic ecoregions
sol.27.7h-k

ICES
CIEM

Published 29 June 2018
https://doi.org/10.17895/ices.pub.4450

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 2019 should be no more than 311 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 and has been above MSY $B_{trigger}$ since 2015. 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.
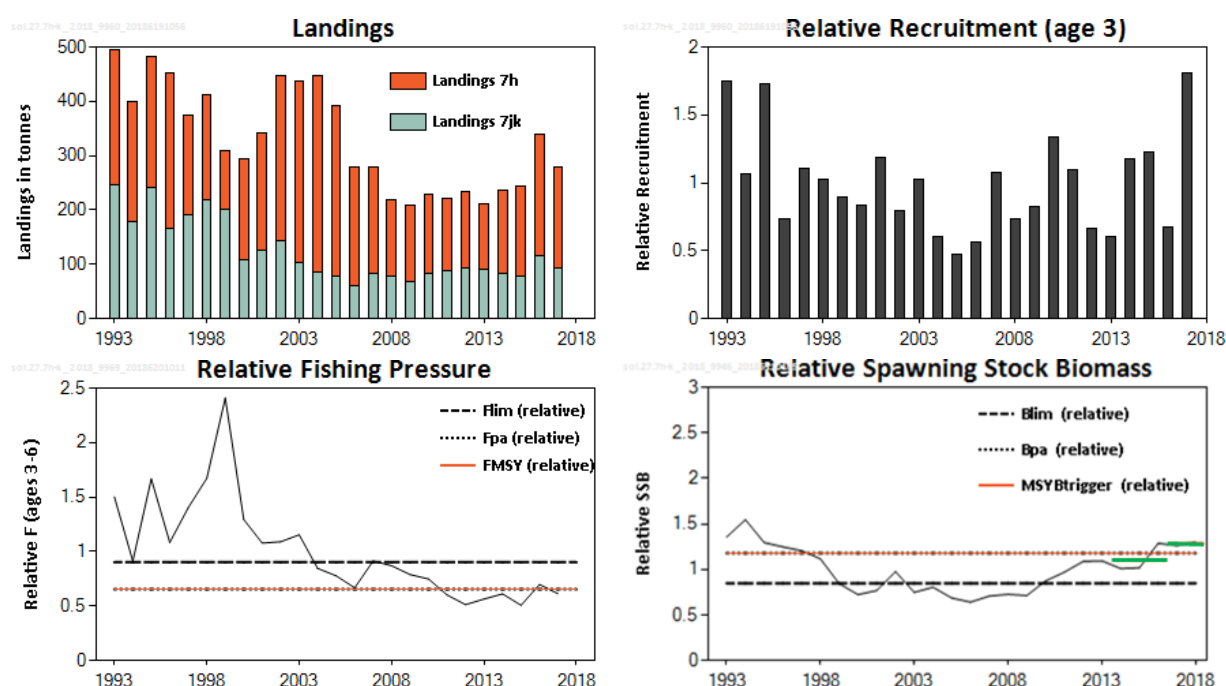

Figure 1   Sole in divisions 7.h–k. Summary of the stock assessment, based on divisions 7.j and 7.k. The landings are for the full stock area (divisions 7.h–k), but only landings from divisions 7.j and 7. k are used in the assessment. Recruitment, F, and SSB values are relative to the average of the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

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 above MSY $B_{trigger\ proxy}$, 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			
		2015	2016	2017		2016	2017	2018
Maximum sustainable yield	F_{MSY} proxy	✅	❌	✅ Below proxy	MSY $B_{trigger}$ proxy	✅	✅	✅ Above proxy
Precautionary approach	F_{pa},F_{lim}	✅	🟠	✅ Harvested sustainably	B_{pa},B_{lim}	✅	✅	✅ Full reproductive capacity
Management plan	F_{MGT}	—	—	— Not applicable	B_{MGT}	—	—	— Not applicable

Catch scenarios

ICES framework for category 3 stocks was applied (ICES, 2012). 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 increased less than 20% and, thus, the uncertainty cap was not applied. The fishing mortality is below and the stock size above proxies of the MSY reference points; therefore, no additional precautionary buffer was applied. Discarding is assumed to be negligible.

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

Index A (2017–2018)		1.28
Index B (2014–2016)		1.10
Index ratio (A/B)		1.16
Uncertainty cap	Not applied	-
Advised catch for 2018 issued in 2017		268
Discard rate		Negligible
Precautionary buffer	Not applied	-
Catch advice**		311
% Advice change***		16% increase

* 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 2018] × [index ratio].

*** Advice value for 2019 relative to advice value for 2018.

This year's advice has increased by 16% when compared to last year's advice, which is in line with the increase in the biomass index.

Basis of the advice

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

Advice basis	Precautionary approach
Management plan	The EU has proposed a multiannual management plan for the Western Waters, which is not yet finalized (EU, 2018).

Quality of the assessment

The advice is based on an assessment considered indicative of trends. The available landings-at-age data do not historically cover the whole area and fishery. Furthermore, there is a lack of reliable information on younger fish and no fishery-independent information.

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

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 $B_{trigger\ proxy}$	1.18	B_{pa}	ICES (2017, 2018)
	$F_{MSY\ proxy}$	0.65	Median point estimates of EqSim with a segmented regression S–R relationship	ICES (2017, 2018)
Precautionary approach	B_{lim}	0.85	Break point segmented regression S–R relationship	ICES (2017, 2018)
	B_{pa}	1.18	$B_{lim} \times \exp(1.645 \times \sigma)$; $\sigma = 0.20$	ICES (2017, 2018)
	F_{lim}	0.89	F with 50% probability of SSB< B_{lim}	ICES (2017, 2018)
	F_{pa}	0.65	$F_{lim} \times \exp(-1.645 \times \sigma)$; $\sigma = 0.20$	ICES (2017, 2018)
Management plan	SSB_{mgt}	Not applicable		
	F_{mgt}	Not applicable		

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

Basis of the assessment

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

ICES stock data category	3 (ICES, 2016)
Assessment type	Age-based analytical assessment (XSA) indicative of stock trends (ICES, 2018)
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	Discarding is considered negligible and is not included.
Indicators	None
Other information	Reference points were defined in 2017 (ICES, 2017).
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
2013	Decrease catches by 8% (15% increase, followed by 20%	< 200	402	212	211

Year	ICES advice	Catch corresponding to advice	Agreed TAC	Official landings	ICES landings
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	≤ 205	382	329*	344
2017	Precautionary approach (increase recent advised value	≤ 223	382	280*	295
2018	Precautionary approach (increase recent advised value	≤ 268	382		
2019	Precautionary approach	≤ 311			

*Preliminary.

History of the catch and landings

Table 7 Sole in divisions 7.h–k. Catch distribution by fleet in 2017 as estimated by ICES.

Catch	Landings			Discards
300 tonnes	Otter trawl 59%	Beam trawl 39%	Other 2%	5 tonnes (negligible)
	295 tonnes			

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–k	7.h–k	7.h–k
	7.h					7.j				7.k			Total	Total	Total	ICES estim.
	Bel.	Fra.	Ire.	NL	UK	Bel.	Fra.	Ire.	UK	Fra.	Ire.	UK				
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	344
2017*	70	75	4	0	38	4	6	81	1	1	1	0	188	92	280	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)	Relative SSB	Landings 7.h*	Landings 7.j–k	Relative F (ages 3–6)
1993	1.75	1.35	249	246	1.50
1994	1.06	1.55	222	178	0.91
1995	1.73	1.29	241	241	1.67
1996	0.73	1.25	285	166	1.08
1997	1.11	1.21	183	191	1.40
1998	1.03	1.12	194	219	1.67
1999	0.90	0.84	110	200	2.4
2000	0.83	0.72	185	109	1.29
2001	1.19	0.77	214	127	1.08
2002	0.80	0.98	303	144	1.09
2003	1.02	0.75	336	102	1.15
2004	0.60	0.80	362	85	0.85
2005	0.47	0.69	316	77	0.78
2006	0.56	0.64	218	61	0.67
2007	1.07	0.71	195	83	0.91
2008	0.74	0.73	142	77	0.87
2009	0.82	0.71	139	69	0.79
2010	1.33	0.87	147	82	0.75
2011	1.10	0.97	135	87	0.60
2012	0.66	1.09	140	94	0.51
2013	0.61	1.09	121	91	0.57
2014	1.18	1.01	154	83	0.61
2015	1.23	1.02	166	78	0.51
2016	0.68	1.29	223	115	0.70
2017	1.81	1.26	188	92	0.61
2018		1.30			

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

Sources and references

EU 2018. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a multiannual plan for fish stocks in the Western Waters and adjacent waters, and for fisheries exploiting those stocks, amending Regulation (EU) 2016/1139 establishing a multiannual plan for the Baltic Sea, and repealing Regulations (EC) No 811/2004, (EC) No 2166/2005, (EC) No 388/2006, (EC) 509/2007 and (EC) 1300/2008. COM/2018/0149 final. 30 pp. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018PC0149&from=EN.

ICES. 2012. ICES Implementation of Advice for Data-limited Stocks in 2012 in its 2012 Advice. ICES CM 2012/ACOM:68. 42 pp.

ICES. 2016. Advice basis. *In* Report of the ICES Advisory Committee, 2016. ICES Advice 2016, Book 1, Section 1.2.

ICES. 2017. Report of the Working Group for the Celtic Seas Ecoregion (WGCSE), 9–18 May 2017, ICES Headquarters, Copenhagen, Denmark. ICES CM 2017/ACOM:13. 1464 pp.

ICES. 2018. Report of the Working Group for the Celtic Seas Ecoregion (WGCSE), 9–18 May 2018, ICES Headquarters, Copenhagen, Denmark. ICES CM 2018/ACOM:13. In prep.