

Haddock (*Melanogrammus aeglefinus*) in Division 7.a (Irish Sea)

ICES advice on fishing opportunities

ICES advises that when the EU multiannual plan (MAP) for Western Waters and adjacent waters is applied, catches in 2020 that correspond to the F ranges in the MAP are between 2333 and 3830 tonnes. According to the MAP, catches higher than those corresponding to F_{MSY} (3156 tonnes) can only be taken under conditions specified in the MAP, while the entire range is considered precautionary when applying the ICES advice rule.

Stock development over time

The spawning–stock biomass (SSB) is currently estimated to be well above $MSY B_{trigger}$. Fishing mortality (F) has been below F_{MSY} since 2013. Recruitment is highly variable throughout the time series but is estimated to be below average since 2016.

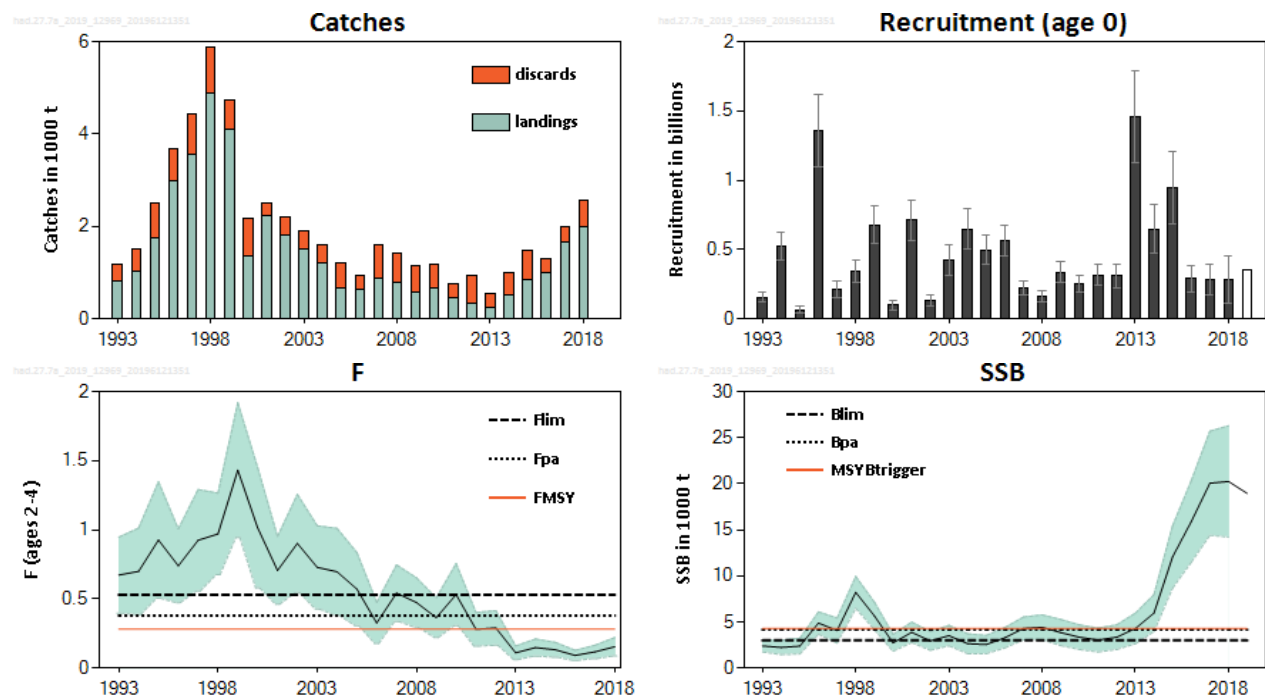


Figure 1 Haddock in Division 7.a. Summary of stock assessment (weights in thousand tonnes), The assumed 2019 recruitment value is not shaded. Shaded areas in F and SSB plots and error bars in the recruitment plot represent 95% confidence intervals. Uncertainty boundaries are not available for 2019.

Stock and exploitation status

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

Table 1 Haddock in Division 7.a. 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}	✓	✓	✓ Below range	B_{MGT}	✓	✓	✓ Above trigger

Catch scenarios

Table 2 Haddock in Division 7.a. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
$F_{ages\ 2-4}$ (2019)	0.25	Catch constraint. TAC 2019 adjusted for annual reallocation of landings from rectangles 33E2 and 33E3 (10-year average value) = 3739 t - 430 t = 3309 t
SSB_{2020}	14 160	Tonnes (t); short-term forecast.
$R_{age\ 0}$ (2019 and 2020)	357 134	Thousands; Geometric mean (1993–2016).
Catch (2019)	3 746	Tonnes; short-term forecast.
Wanted catch * (2019)	3 309	Tonnes; average discard ratio (2016–2018).
Unwanted catch * (2019)	437	Tonnes; average discard ratio (2016–2018).

* “Wanted catch” is used to describe fish that would be landed in the absence of the EU landing obligation. “Unwanted catch” refers to the component that was previously discarded.

Table 3 Haddock in Division 7.a. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2020)	Wanted catch * (2020)	Unwanted catch * (2020)	F_{total} (2020)	F_{wanted} (2020)	$F_{unwanted}$ (2020)	SSB (2021)	% SSB change **	% Advice change ^
ICES advice basis									
EU MAP ^^: F_{MSY}	3156	2667	489	0.28	0.19	0.086	10493	-26	-15.6
$F = MAP\ F_{MSY\ lower}$	2333	1975	358	0.20	0.14	0.061	11317	-20	-38
$F = MAP\ F_{MSY\ upper}$	3830	3232	598	0.35	0.24	0.11	9824	-31	2.4
Other scenarios									
$F = 0$	0	0	0	0	0	0	13678	-3.4	-100
F_{pa}	4106	3463	644	0.38	0.26	0.12	9550	-33	9.8
F_{lim}	5141	4324	817	0.50	0.35	0.15	8533	-40	38
$SSB_{2020} = B_{lim}$	11133	9142	1991	1.64	1.14	0.50	2994	-79	198
$SSB_{2021} = B_{pa}$	9788	8099	1690	1.28	0.89	0.39	4160	-71	162
$SSB_{2021} = MSY\ B_{trigger}$	9653	7992	1661	1.24	0.86	0.38	4281	-70	158
$F = F_{2019}$	2887	2441	446	0.25	0.18	0.07	10762	-24	-23

* “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.

^ Advice value for 2020 relative to advice value for 2019 (3739 tonnes).

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

The advised catch for 2020 is 15.6% lower than the 2019 advice, as a result of a decline in stock size.

Basis of the advice

Table 4 Haddock in Division 7.a. The basis of the advice.

Advice basis	Management plan
Management plan	<p>The EU multiannual plan (MAP) for stocks in in the Western Waters 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 $MSY_{Btrigger}$, 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 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> <p>Full details of the plan are described in EU (2019).</p>

Quality of the assessment

The recent changes from bycatch to targeted fishing activity are accounted for with the inclusion of an updated selectivity pattern from 2013 onwards.

Recruitment estimates have been revised substantially between assessments, with a high degree of interannual variation.

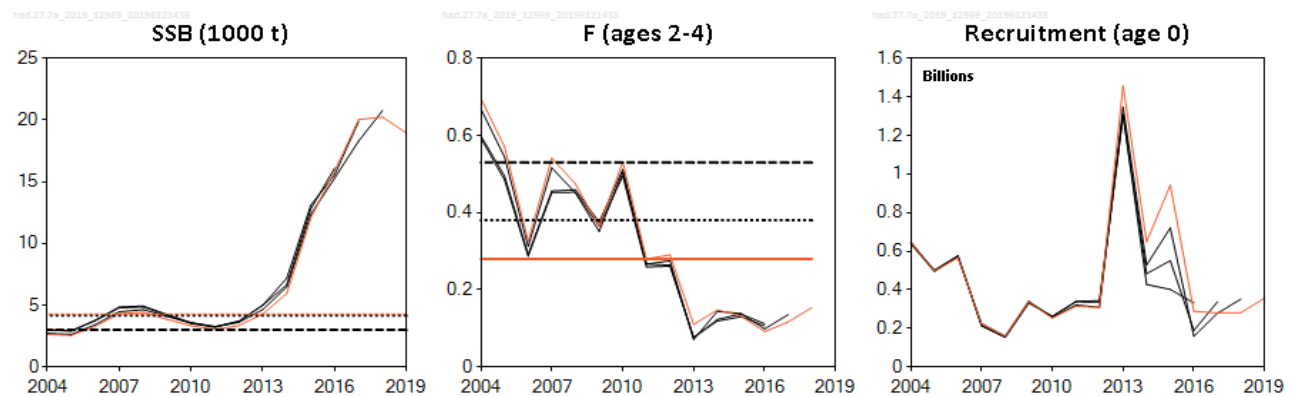


Figure 2. Haddock in Division 7.a. Historical assessment results (final-year recruitment estimates included).

Issues relevant for the advice

The assessment and the advice are for Division 7.a, excluding the rectangles 33E2 and 33E3 in the Irish Sea.

Landings are adjusted to exclude those reported from rectangles 33E2 and 33E3 in the Irish Sea, as they are not considered to be part of this stock (Table 10). The annual reallocation has increased since 2006, peaking in 2017. In 2018 the reallocation accounted for 21% of the reported landings in Division 7.a, and contributed 7.5% of the estimated landings in divisions 7. b–k . This should be considered when setting TACs for the two management areas for haddock in divisions 7.a and 7.b–k. Changes in the TAC for the haddock stock in Division 7.a may have implications for the fishing pressure on haddock in divisions 7.b–k.

Reference points

Table 5 Haddock in Division 7.a. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	4281	Tonnes; the 5th percentile of B_{MSY} ; Division 7.a haddock has been fished at, or below F_{MSY} for > five years.	ICES (2018a)
	F_{MSY}	0.28	Median point estimates of EqSim with a segmented regression stock–recruitment relationship.	ICES (2018a)
Precautionary approach	B_{lim}	2994	Tonnes; lowest observed SSB with >75th percentile recruitment.	ICES (2018a)
	B_{pa}	4160	Tonnes; B_{lim} combined with the assessment error; $B_{lim} \times \exp(1.645 \times \sigma)$; $\sigma = 0.20$.	ICES (2018a)
	F_{lim}	0.50	F with 50% probability of SSB < B_{lim} .	ICES (2018a)
	F_{pa}	0.38	F_{lim} combined with the assessment error; $F_{lim} \times \exp(-1.645 \times \sigma)$; $\sigma = 0.20$.	ICES (2018a)
Management plan	MAP MSY $B_{trigger}$	4281	Tonnes; MSY $B_{trigger}$	ICES (2018a), EU (2019)
	MAP B_{lim}	2994	Tonnes; B_{lim}	ICES (2018a), EU (2019)
	MAP F_{MSY}	0.28	F_{MSY}	ICES (2018a), EU (2019)
	MAP range F_{lower}	0.20	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2018a), EU (2019)
	MAP range F_{upper}	0.35	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	ICES (2018a), EU (2019)

Basis of the assessment

Table 6 Haddock in Division 7.a. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018b).
Assessment type	ASAP (Age-Structured Assessment Programme; NOAA toolbox) that uses catches in the model and in the forecast (ICES, 2019).
Input data	Four survey indices (NIGFS-WIBTS-Q1, NIGFS-WIBTS-Q4, NIMIK, UKFSPW); annual maturity and growth data from the NIGFS-WIBTS-Q1 survey and from commercial landings in quarter 1. Commercial catch-at-age.
Discards and bycatch	Included in the assessment for the full time-series.
Indicators	None.
Other information	This stock was benchmarked in 2017 (ICES, 2017). Revision in reference points in 2018 (ICES, 2018a).
Working group	Working Group for the Celtic Seas Ecoregion (WGCSE)

Information from stakeholders

There is no additional information available.

History of the advice, catch, and management

Table 7 Haddock in Division 7.a. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Landings corresponding to advice	Agreed TAC *	Official landings	ICES landings	ICES discards	ICES catches
1987	Not dealt with			6000	1287	1287		
1988	Not dealt with			6000	747	747		
1989	Not dealt with			6000	560	560		
1990	Not dealt with			6000	582	582		
1991	Not dealt with			6000	616	616		
1992	Not dealt with			6000	703	656		
1993	Not dealt with			6000	730	813		
1994	Not dealt with			6000	681	1042		
1995	Not dealt with			6000	841	1736	780	2516
1996	No advice			10000	1453	2981	709	3690
1997	Means of setting catch limits required			14000	1925	3547	895	4442
1998	Catch limit for Division 7.a		3000	20000	3015	4874	1015	5889
1999	No increase in F; catch limit for Division 7.a		7000	4990	2370	4095	634	4729
2000	Reduce F below F_{pa}		< 2800	3400	2447	1357	802	2159
2001	Reduce F below F_{pa}		< 1710	2700	2229	2246	269	2515
2002	Reduce F below F_{pa}		< 1200	1300	1115	1817	387	2204
2003	No cod catches		-	585	674	659 [^]	-	-
2004	$F < F_{pa}$		< 1500	1500	761	1217	392	1609
2005	$F < F_{pa}$		< 1370	1500	547	666	551	1217
2006	Substantial reduction in fishing mortality	-		1275	655	633	306	939
2007	Substantial reduction in fishing mortality	-		1179	1078	886	722	1608
2008	No increase in effort	-		1238	879	786	643	1429
2009	No increase in effort	-		1424	846	581	579	1160
2010	No increase in effort	-		1424	939	679	508	1187
2011	See scenarios	-		1317	813	446	307	753
2012	Reduce catch and improved selectivity	-		1215	813	343	599	942
2013	Decrease catch by 18%	-	< 710	1189	656	254	283	537
2014	Increase catch by 17%	1120	< 572	1181	974	518	488	1006
2015	Increase catch by 20%	< 893	< 425	1181	1154	833	652	1485
2016	Precautionary approach (increase catch by 20%)	≤ 1072	≤ 481	1654	1477	1008	298	1306
2017	MSY approach	≤ 3061	≤ 2348	2615 ***	2379	1662	333	1995
2018	MSY approach	≤ 3444	≤ 2796	3207	2523 **	1993	568	2561
2019	MSY approach	≤ 3739	≤ 3334	3739				
2020	Management plan	3156 (range 2333–3830)						

* Precautionary TAC for subareas 7–10 and CECAF 34.1.1 up to 1998. Since 1999 a special condition or separate TAC has been set for Division 7.a.

** Preliminary.

*** Revised TAC in March 2017.

[^] Underestimate because of inadequate sampling.

History of the catch and landings

Table 8 Haddock in Division 7.a. Catch distribution by fleet in 2018 as estimated by ICES.

Catch	Estimated landings				
	Otter trawls		Scottish seines	Mid-water trawl	Other gear types
2561 tonnes	<i>Nephrops</i> directed fishery	Demersal fish directed fishery	3%	29%	< 1%
	8%	60%			
	1993 tonnes				
	Estimated discards				
	Otter trawls		Scottish seines	Mid-water trawl	Other gear types
	<i>Nephrops</i> directed fishery	Demersal fish directed fishery	1%	3%	0%
	57%	39%			
	568 tonnes				

Table 9 Haddock in Division 7.a. History of official landings and ICES estimates of landings (tonnes).

Year	Belgium	France	Ireland	Netherlands	UK (England & Wales) *	UK (Isle of Man)	UK (N. Ireland) *	UK (Scotland) **	United Kingdom **	Total	ICES landings ^
1984	3	38	199	-	29	2	38	78		387	387
1985	4	31	341	-	28	5	215	104		728	728
1986	5	39	275	-	22	4	358	23		726	726
1987	10	50	797	-	41	3	230	156		1287	1287
1988	12	47	363	-	74	3	196	52		747	747
1989	4	n/a	215	-	252	3	-	86		560	560
1990	4	n/a	80	-	177	5	-	316		582	582
1991	1	n/a	254	-	204	14	-	143		616	616
1992	8	73	251	-	244	13	-	114		703	656
1993	18	41	252	-	260	19	-	140		730	813
1994	22	22	246	-	301	24	-	66		681	1042
1995	32	58	320	-	294	27	-	110		841	1736
1996	34	105	798	1	463	38	-	14		1453	2981
1997	55	74	1005	14	717	9	-	51		1925	3547
1998	104	86	1699	10	1023	13	-	80		3015	4874
1999	53	n/a	759	5	1479	7	-	67		2370	4095
2000	22	49	1238	2	1061	19	-	56		2447	1357
2001	68	184	652	-	1238	1	-	86		2229	2246
2002	44	72	401	-	551	-	-	47		1115	1817
2003	20	146	229	-	248	-	-	31		674	n/a
2004	15	20	296	-	421	-	-	9		761	1217
2005	22	36	139	-	344	-	-	6		547	666
2006	23	20	184	-	419	-	-	9		655	633
2007	30	11	477	-	559	-	-	1		1078	886
2008	15	6	319	-	521	1	-	17		879	786
2009	7	3	388	-	446	1	-	1		846	581
2010	9	2	333	-	593	-	-	2		939	679
2011	16	8	434	-	355	-	-			813	446
2012	13	3	561	-		-			236	813	343
2013	6	1	492	-		< 1			155	656	254
2014	7	0	541	-		< 1			426	974	518
2015	7	7	507	-		< 1			634	1154	833
2016	5	1	632	-					825	1463	1008
2017	5	5	1114	-					1240	2363	1662
2018 ***	4	0	949	-					1580	2532	1993

* From 1989 to 2011, Northern Ireland is included with England and Wales.

** Since 2012, Northern Ireland and Scotland have been included with UK.

*** Preliminary.

^ Landings in the southern part of Division 7.a (rectangles 33E2 and 33E3) are excluded. n/a = not available.

Table 10 Haddock in Division 7.a. ICES landings, discards, catch, and % discards by weight for Division 7.a haddock. All weights are in tonnes.

Year	ICES landings	ICES discards estimates	ICES catch estimates	% discard	Landings taken or reported in rectangles 33E2 and 33E3 (belonging to the 7.b–k stock) **
1995	1736	780	2516	31.0	16
1996	2981	709	3690	19.2	33
1997	3547	895	4442	20	36
1998	4874	1015	5889	17.2	28
1999	4095	634	4729	13.4	34
2000	1357	802	2159	37	11
2001	2246	269	2515	10.7	74
2002	1817	387	2204	17.6	82
2003 *	659	-	-	-	64
2004	1217	392	1609	24	53
2005	666	551	1217	45	35
2006	633	306	939	33	26
2007	886	722	1608	45	222
2008	786	643	1429	45	194
2009	581	579	1160	50	285
2010	679	508	1187	43	267
2011	446	307	753	41	374
2012	343	599	942	64	473
2013	254	283	537	53	410
2014	518	488	1006	49	470
2015	833	652	1485	44	322
2016	1008	298	1306	23	455
2017	1662	333	1995	17	715
2018	1993	568	2561	22	532

* Underestimate or low confidence due to inadequate sampling.

** Landings in the southern part of Division 7.a (rectangles 33E2 and 33E3) are not included in the assessment, and are considered to be part of the stock had.27.7b–k.

Summary of the assessment

Table 11 Haddock in Division 7.a. Assessment summary. All weights are in tonnes. Recruitment presented in thousands. Low and high refer to 95% confidence intervals.

Year	Recruitment age 0			SSB			Landings	Discards	F ages 2–4		
	Low	Value	High	Low	Value	High			Low	Value	High
1993	117263	1738	190222	1738	2391	3045	813	365	0.40	0.67	0.95
1994	426481	1457	627549	1457	2234	3012	1042	468	0.39	0.70	1.01
1995	39015	1524	86733	1524	2376	3227	1736	780	0.50	0.93	1.35
1996	1100525	3669	1614045	3669	4879	6090	2981	709	0.47	0.74	1.01
1997	150293	2710	271688	2710	4066	5423	3547	895	0.56	0.92	1.29
1998	261794	6484	426912	6484	8209	9934	4874	1015	0.67	0.97	1.26
1999	545384	4153	809909	4153	5648	7144	4095	634	0.94	1.43	1.92
2000	64042	1811	132556	1811	2727	3644	1357	802	0.58	1.01	1.45
2001	562831	2760	855906	2760	3873	4985	2246	269	0.46	0.71	0.95
2002	92875	1925	176049	1925	2938	3951	1817	387	0.55	0.90	1.26
2003	313251	2407	534829	2407	3518	4629	1517	390	0.43	0.73	1.03
2004	503513	1562	789540	1562	2636	3711	1217	392	0.38	0.70	1.01
2005	388532	1555	603481	1555	2547	3538	666	551	0.31	0.57	0.83
2006	457145	2180	676355	2180	3288	4395	633	306	0.177	0.33	0.47
2007	172165	3066	276296	3066	4298	5529	886	722	0.34	0.54	0.75
2008	117980	3072	199010	3072	4416	5761	786	643	0.30	0.47	0.65
2009	262421	2431	411201	2431	3848	5265	581	579	0.22	0.36	0.51
2010	192055	2005	313207	2005	3344	4682	679	508	0.31	0.53	0.76
2011	239260	1742	389020	1742	3037	4331	446	307	0.159	0.28	0.40
2012	222930	2007	394450	2007	3345	4684	343	599	0.165	0.29	0.42
2013	1127346	2626	1790100	2626	4287	5948	254	282	0.061	0.110	0.159
2014	476477	3950	820724	3950	5958	7965	518	488	0.086	0.148	0.21
2015	683668	8680	1202519	8680	12058	15436	833	652	0.078	0.132	0.186
2016	189865	11468	385994	11468	15894	20320	1008	298	0.055	0.091	0.128
2017	171930	14401	387946	14401	20049	25697	1662	333	0.069	0.117	0.165
2018	111690	14200	450562	14200	20241	26283	1993	568	0.087	0.154	0.22
2019	357134 *				18945						

*Geometric mean recruitment 1993–2016.

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. 2017a. Report of the Benchmark Workshop on the Irish Sea Ecosystem (WKIrish3), 30 January–3 February 2017, Galway, Ireland. ICES CM 2017/BSG:01. 165 pp.

ICES. 2018a. EU request to ICES to provide plausible and updated FMSY ranges for the stocks of species inhabiting western EU waters. *In* Report of ICES Advisory Committee, 2018. ICES Advice 2018, sr.2018.04. 11 pp. <https://doi.org/10.17895/ices.pub.4149>

ICES. 2018b. Advice basis. *In* Report of the ICES Advisory Committee, 2018. ICES Advice 2018, Book 1, Section 1.2. <https://doi.org/10.17895/ices.pub.4503>

ICES. 2019. Report of the Working Group for the Celtic Seas Ecoregion. ICES Scientific Reports. 1:29. XXXX pp. <http://doi.org/10.17895/ices.pub.4982>.

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