

Haddock (*Melanogrammus aeglefinus*) in divisions 7.b–k (southern Celtic Seas and English Channel)

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 11 418 and 23 262 tonnes. According to the MAP, catches higher than those corresponding to F_{MSY} (16 671 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

Spawning–stock biomass (SSB) has declined since 2011 and remains above $MSY B_{trigger}$ in 2019. Fishing mortality (F) has been above F_{MSY} for the entire time series. Recruitment in 2018 was estimated to be the second highest in the time-series.

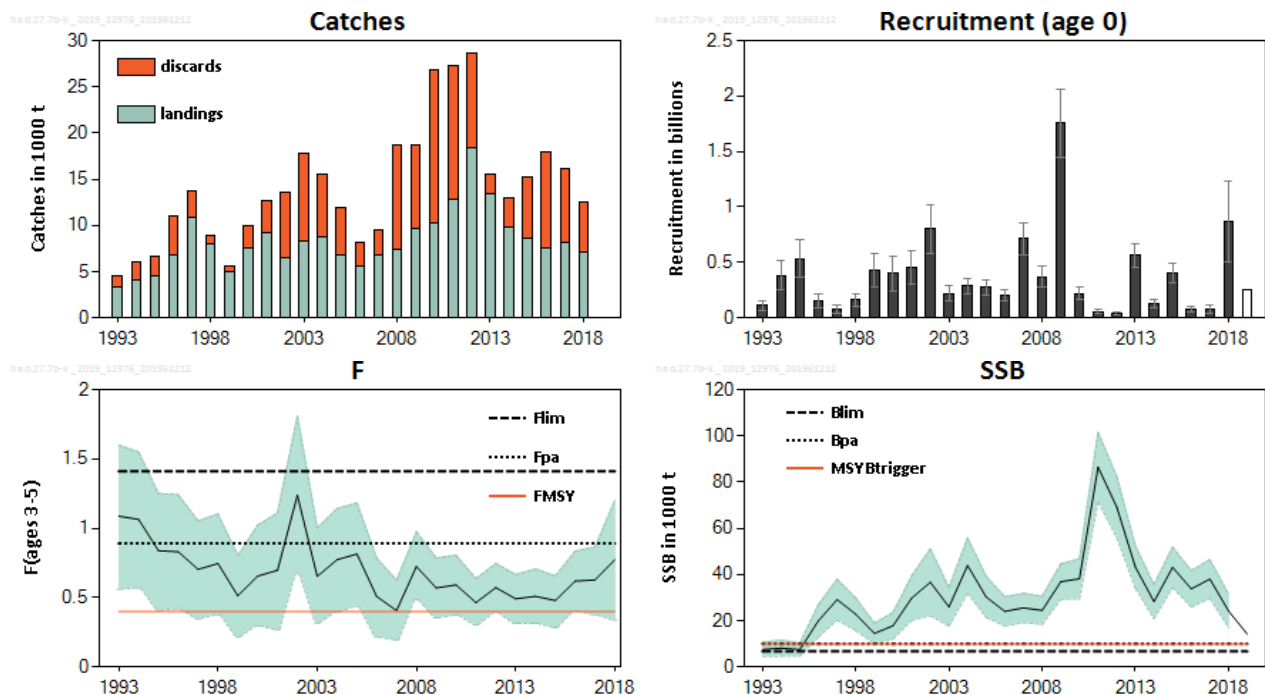


Figure 1 Haddock in divisions 7.b–k. Summary of the stock assessment. The assumed 2019 recruitment value is unshaded. Shaded areas in F and SSB plots and error bars in the recruitment plot represent 95% confidence intervals. Uncertainty boundaries are not available for 2019.

Stock and exploitation status

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

Table 1 Haddock in divisions 7.b–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}	✗	✗	✗	Above	$B_{trigger}$	✓	✓	✓	Above trigger
Precautionary approach	F_{pa} , F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa} , B_{lim}	✓	✓	✓	Full reproductive capacity
Management plan	F_{MGT}	✗	✗	✗	Above range	B_{MGT}	✓	✓	✓	Above trigger

Catch scenarios

Table 2 Haddock in divisions 7.b–k. Assumptions made for the interim year and in the forecast.

Variable	Value	Notes
$F_{ages\ 3-5}$ (2019)	0.77	$F_{sq} = F_{Average}$ (2016–2018), rescaled to 2018
SSB_{2020}	49 821	Tonnes; Short term forecast.
$R_{age\ 0}$ (2019–2020)	252 713	Thousands; Geometric mean (1993–2016)
Catch (2019)	20 457	Tonnes; Short term forecast.
Wanted catch (2019)	6 963	Tonnes; Average discard ratio (1993–2018)
Unwanted catch (2019)	13 494	Tonnes; Average discard ratio (1993–2018)

Table 3 Haddock in divisions 7.b–k. 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}	16671	8068	8603	0.4	0.35	0.054	47629	-4.4	164
$F=MAP\ F_{MSY\ lower}$	11418	5548	5870	0.26	0.23	0.035	53090	6.6	81
$F=MAP\ F_{MSY\ upper}$	23262	11196	12066	0.6	0.52	0.08	40890	-17.9	270
Other scenarios									
$F = 0$	0	0	0	0			65183	31	-100
F_{pa}	31221	14909	16312	0.89	0.77	0.119	32954	-34	390
F_{lim}	41910	19747	22164	1.41	1.22	0.189	22766	-54	560
$SSB_{2021} = B_{lim}$	61452	27772	33680	3.4	3	0.46	6700	-87	870
$SSB_{2021} = B_{pa} = MSY\ B_{trigger}$	56879	26040	30839	2.7	2.3	0.36	10000	-80	800
$F = F_{2019}$	28208	13513	14696	0.77	0.67	0.104	35929	-28	350

* “Wanted” and “unwanted” catch are used to describe fish that would be landed and discarded, respectively, in the absence of the EU landing obligation.

** SSB 2021 relative to SSB 2020.

^ Advice value for 2020 relative to advice value for 2019 (6317 tonnes).

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

Total advised catch for 2020 is higher than the 2019 advice, because the estimated incoming recruitment is expected to result in a substantial increase in biomass.

Basis of the advice

Table 4 Haddock in divisions 7.b–k. The basis of the advice.

Advice basis	Management plan
Management plan	<p>The EU multiannual plan (MAP) for stocks 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 assessment in 2019 has increased the perception of recent SSB, in line with the re-estimation of average weights-at-age between 2014 and 2019.

The high recruitment in 2018 is based on high survey indices in both French and Irish components of the IBTS survey.

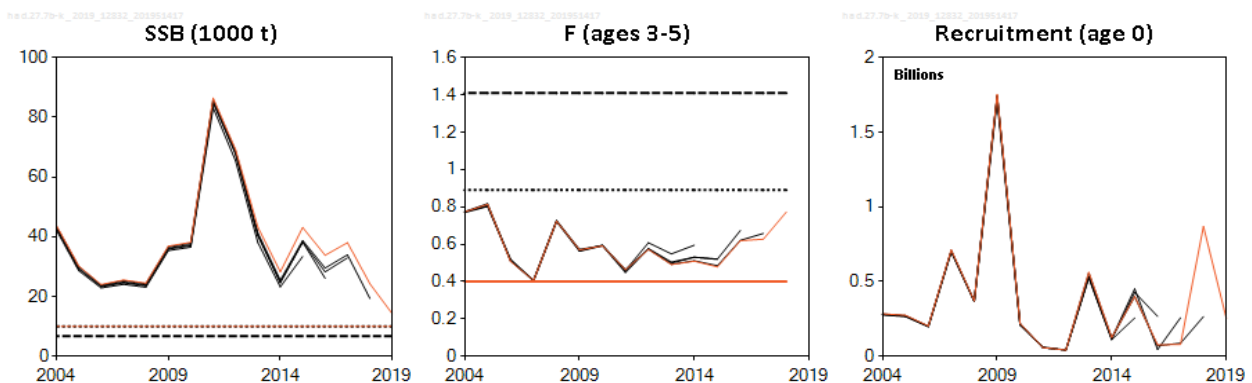


Figure 2 Haddock in divisions 7.b–k. Historical assessment results (final-year recruitment assumptions included).

Issues relevant for the advice

The assessment and the advice are for divisions 7.b–k, including the rectangles 33E2 and 33E3 in the Irish Sea.

Landings are adjusted to include those reported from rectangles 33E2 and 33E3 in the Irish Sea, as they are considered part of this stock. This annual reallocation has increased since it was first applied in 2006, peaking in 2017. The 2018 reallocation of 532 tonnes accounted for 7.5% of the ICES estimated division 7 b-k landings, and 21% of the landings from the Irish Sea (Division 7a). This should be considered when setting TACs for the two management areas (divisions 7.a and 7.b–k), because a portion of the catch taken under the 7.a TAC are considered part of the 7.b-k stock.

Discards by weight continued to be high in 2018, comprising over 40% of the catch. The model estimates a high recruitment in 2018, and these young fish are likely to be discarded in 2019 and 2020 if fishing practices follow those seen in recent years, leading to even higher amounts of discards. As a result of the large recruitment, forecast catches at F_{sq} in 2019 (20 457 tonnes) are estimated to be well in excess of the TAC (8329 tonnes).

Mixed-fisheries considerations

Haddock in 7b-k is caught as part of a mixed fishery with cod and whiting. Mixed-fisheries advice will be provided in the Celtic Seas fisheries overview later in the year.

Reference points

Table 5 Haddock in divisions 7.b–k. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	10000	Tonnes; B_{pa}	ICES (2016)
	F_{MSY}	0.40	Median point estimates of EqSim with a segmented regression stock–recruitment relationship.	ICES (2016)
Precautionary approach	B_{lim}	6700	Tonnes; lowest observed SSB	ICES (2016)
	B_{pa}	10000	Tonnes; B_{lim} combined with the assessment error; $B_{lim} \times \exp(1.645 \times \sigma)$; $\sigma = 0.26$	ICES (2016)
	F_{lim}	1.41	F with 50% probability of $SSB < B_{lim}$	ICES (2016)
	F_{pa}	0.89	F_{lim} combined with the assessment error; $F_{lim} \times \exp(-1.645 \times \sigma)$; $\sigma = 0.28$	ICES (2016)
Management plan	MAP MSY $B_{trigger}$	10000	Tonnes; MSY $B_{trigger}$	EU (2019), ICES (2016)
	MAP B_{lim}	6700	Tonnes; B_{lim}	EU (2019), ICES (2016)
	MAP F_{MSY}	0.40	F_{MSY}	EU (2019), ICES (2016)
	MAP range F_{lower}	0.26	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	EU (2019), ICES (2017)
	MAP range F_{upper}	0.60	Consistent with ranges resulting in no more than 5% reduction in long-term yield compared with MSY.	EU (2019), ICES (2017)

Basis of the assessment

Table 6 Haddock in divisions 7.b–k. Basis of the assessment and advice.

ICES stock data category	1 (ICES, 2018).
Assessment type	ASAP (Age-Structured Stochastic Assessment Programme; NOAA toolbox) that uses catches in the model and in the forecast (ICES, 2019).
Input data	Commercial catches (age composition of landings and discards); survey index (combined IGFS-WIBTS-Q4 and EVHOE-WIBTS-Q4); commercial index (IRL_OTB_HAD); maturity data (surveys and observer data; constant for all years); natural mortalities (based on Lorenzen, 1996).
Discards and bycatch	Included in the assessment for the full time-series.
Indicators	None.
Other information	This stock was benchmarked in 2012 (ICES, 2012).
Working groups	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 divisions 7.b–k. 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 ##	Discards	ICES catch
1987	Not dealt with				3000 ^^^	2600 ^^^	n/a	2600 ^^^
1988	Not dealt with				4000 ^^^	3600 ^^^	n/a	3600 ^^^
1989	Not dealt with				4200 ^^^	3200 ^^^	n/a	3200 ^^^
1990	Not dealt with				2900 ^^^	2000 ^^^	n/a	2000 ^^^
1991	Not dealt with				2900 ^^^	2300 ^^^	n/a	2300 ^^^
1992	Not dealt with				2900 ^^^	2700 ^^^	n/a	2700 ^^^
1993	Not dealt with				3400 ^^^	3348	1208	4556
1994	Not dealt with				4076	4131	1886	6017
1995	Not dealt with			600 *	4468	4470	2218	6688
1996	Not dealt with			700 **	6653	6756	4309	11065
1997	Not dealt with			1400	10270	10827	2883	13710
1998	Not dealt with			2000	7361	7928	934	8862
1999	Not dealt with			2200 ***	5247	4970	586	5556
2000	No expansion of catches			16600 ***	6656	7499	2503	10002
2001	No expansion of catches			1200 ***	9702	9278	3418	12696
2002	No expansion of catches		8000	9300 ***	7089	6488	7073	13561
2003	No expansion of catches		7200	8185 ***	8241	8292	9456	17748
2004	No increase in F			9600 ***	8453	8777	6750	15527
2005	No increase in effort			11520 ***	6859	6787	5191	11978
2006	No increase in effort			11520 ***	5647	5593	2484	8077
2007	No increase in effort			11520 ***	6629	6781	2739	9520
2008	Same advice as last year			11579 ***	6234	7455	11187	18642
2009	Same advice as last year			11579 ^	9307	9608	9080	18688
2010	Same advice as last year			11579 ^	9999	10262	16547	26809
2011	See scenarios			13316 ^	13709	12879	14378	27257
2012	No increase in catch and technical measures to reduce discards rates			16645 ^	18222	18376	10191	28567
2013	MSY transition		< 9500	14148 ^	13098	13424	2085	15509
2014	MSY transition	< 5281	< 3602	9479 ^	9171	9854	3177	13031
2015	MSY approach	< 10 434	< 5605	8342 ^	8342	8545	6694	15239
2016	MSY approach	≤ 8590	≤ 6078^^	7258 ^	7007	7594	10337	17931
2017	MSY approach	≤ 12 444	≤ 7751	7751 ^	7344	8097	7975	16072
2018	MSY approach	≤ 8358	≤ 5911	6910 ^	6591 #	7109	5436	12545
2019	MSY approach	≤ 6317	≤ 3761	8329 ^				
2020	Management plan	16671(range 11418–23262)						

* Applies to subareas 7–10.

** Increased in-year to 14 000 tonnes.

*** Includes separate Division 7.a allocation.

^ Applies to divisions 7.b–k and subareas 8–10.

^^ Wanted catch.

^^^ Values presented to the nearest 100.

Preliminary.

Including landings from rectangles 33E2 and 33E3 since 2003.

History of the catch and landings

Table 8 Haddock in divisions 7.b–k. Catch distribution by fleet in 2018 as estimated by ICES.

Catch	Landings					Discards				
	Otter trawls	Beam trawls	Gillnets	Seines	Other	Otter trawls	Beam trawls	Gillnets	Seines	Other
12545 t	87%	5%	3%	5%	< 1%	87%	11%	< 1%	2%	< 1%
	7109 t					5436 t				

Table 9 Haddock in divisions 7.b–k. History of commercial catch and landings (in tonnes).

Year	Official landings						ICES estimates			
	Belgium	France	Ireland	UK	Others	Total	Landings	Discards	Catch	Landings taken or reported in 33E2 and 33E3 **
1993	51	1839	1262	256	0	3408	3348	1208	4556	
1994	123	2788	908	240	17	4076	4131	1886	6017	
1995	189	2964	966	266	83	4468	4470	2218	6688	
1996	133	4527	1468	439	86	6653	6756	4309	11065	
1997	246	6581	2789	569	85	10270	10827	2883	13710	
1998	142	3674	2788	444	312	7360	7928	934	8862	
1999	51	2725	2034	278	159	5247	4970	586	5556	
2000	90	3088	3066	289	123	6656	7499	2503	10002	
2001	165	4842	3608	422	665	9702	9278	3418	12696	
2002	132	4348	2188	315	106	7089	6488	7073	13561	
2003	118	5781	1867	393	82	8241	8292	9456	17748	64
2004	136	6130	1715	313	159	8453	8777	6750	15527	53
2005	167	4174	2037	292	197	6867	6787	5191	11978	35
2006	99	3190	1875	274	209	5647	5593	2484	8077	26
2007	119	4142	1930	386	52	6629	6781	2739	9520	222
2008	108	3639	1800	566	121	6234	7455	11187	18642	194
2009	131	5429	2983	716	48	9307	9608	9080	18688	285
2010	170	6240	2609	852	128	9999	10262	16547	26809	267
2011	211	8070	3322	1658	129	13 390	12879	14378	27257	374
2012	231	11793	4130	1901	167	18 222	18376	10191	28567	473
2013	173	8748	2699	1455	21	13 068	13424	2085	15509	410
2014	99	6375	2092	785	18	9171	9854	3177	13031	444
2015	117	5681	1656	759	4	8342	8545	6694	15239	322
2016	88	4487	1713	692	27	7007	7594	10337	17931	468
2017	111	4615	1256	690	13	6685	8097	7975	16072	715
2018 *	89	4478	1434	581	8	6591	7109	5436	12545	532

* Preliminary data.

** Landings in the southern part of Division 7.a (rectangles 33E2 and 33E3) are included in the assessment and are considered part of the stock.

Summary of the assessment

Table 10 Haddock in divisions 7.b-k. Assessment summary. High and Low refer to 95% confidence intervals. All weights in tonnes and recruitment in thousands.

Year	Recruitment age 0			SSB			Landings	Discards	F Ages 3-5		
	Low	Value	High	Low	Value	High			Low	Value	High
1993	65591	4445	158013	4445	7550	10657	3348	1208	0.56	1.09	1.60
1994	246634	4635	520964	4635	8114	11593	4131	1886	0.57	1.06	1.55
1995	366793	4675	700871	4675	7509	10341	4470	2218	0.41	0.84	1.25
1996	92671	12933	208703	12933	19979	27023	6756	4309	0.42	0.83	1.24
1997	43606	20231	110000	20231	29116	38003	10827	2883	0.35	0.70	1.05
1998	100067	15744	220967	15744	22775	29804	7928	934	0.38	0.75	1.10
1999	272956	9999	573600	9999	14458	18917	4970	586	0.22	0.51	0.80
2000	238661	12078	556737	12078	17833	23586	7499	2503	0.30	0.65	1.02
2001	299514	20106	608242	20106	29759	39412	9278	3418	0.27	0.70	1.11
2002	584806	22190	1017456	22190	36655	51122	6488	7073	0.67	1.24	1.81
2003	152828	17634	285172	17634	25954	34274	8292	9456	0.32	0.65	1.00
2004	212381	31939	355743	31939	43868	55795	8777	6750	0.40	0.77	1.14
2005	208231	21324	339895	21324	30228	39132	6787	5191	0.44	0.81	1.18
2006	147566	17660	256698	17660	23989	30320	5593	2484	0.22	0.51	0.78
2007	565899	19179	857833	19179	25527	31873	6781	2739	0.194	0.41	0.63
2008	276819	18378	464465	18378	24448	30518	7455	11187	0.48	0.72	0.97
2009	1450639	29182	2054711	29182	36875	44570	9608	9080	0.35	0.57	0.79
2010	160293	29459	277305	29459	38136	46813	10262	16547	0.37	0.59	0.81
2011	36130	71346	78822	71346	86471	101594	12879	14378	0.30	0.46	0.64
2012	25153	56034	57739	56034	69258	82480	18376	10191	0.39	0.57	0.75
2013	453438	34039	670562	34039	43200	52359	13424	2085	0.31	0.49	0.67
2014	87167	20894	164223	20894	28258	35622	9854	3177	0.31	0.51	0.71
2015	310483	34335	489357	34335	43106	51877	8545	6694	0.28	0.48	0.66
2016	46063	25885	104565	25885	33794	41703	7594	10337	0.40	0.62	0.84
2017	44372	29615	113148	29615	38018	46422	8097	7975	0.38	0.63	0.87
2018	500682	17001	1237524	17001	24239	31477	7109	5436	0.34	0.77	1.20
2019		18992*			14205				0.56		

* Geometric mean (1993-2016).

Sources and references

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